

WP 1 / WP6	Milestone No. 11.1
-------------------	---------------------------

MARBEFES Project

<p>Title: MARBEFES WP1: Stakeholder involvement Milestone 11.1: Results of the Stakeholder Consultations in Martinique, France</p> <p>Delivery date: 19 March 2026</p>
<p>Project General Coordinator: Jan Marcin Węstawski Project Scientific Manager: Julie Bremner Project Manager: Joanna Potrykus</p>
<p>Task Leader(s) Herman Hummel</p>
<p>Author(s) Dominga van der Vliet Vivièn Laros Hanie Matajinimvar Herman Hummel</p>
<p>Submission date 19 March 2026</p>



Document Version Control			
Version	Date	Comment	Checked by
1	18-01-2026	First draft by Dominga van der Vliet	Herman Hummel
2	19-03-2026	Second draft and finalisation	Herman Hummel



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Content

1. Introduction	4
2. Materials and Methods	5
2.1. Preparations	5
2.2. Stakeholder participation	5
2.3. Stakeholder Interviews	6
2.4. Stakeholder workshop	6
3. Results	9
3.1. Stakeholder Interviews	9
3.2. Stakeholder Workshop	11
3.2.1. Priorities as Indicated by Stakeholders	11
3.2.2. The MARBEFES Toolbox and the BowTie	12
3.2.3. Governance and Marine Protected Areas	12
3.2.4. Scenarios of Change	12
3.2.5. Decision Support System	12
4. Discussion and Conclusions	15
5. Acknowledgements	16
6. References	17
Appendices	18
Appendix 1. Stakeholder Participation List	19
Appendix 2. Flyer send to potential stakeholders	20
Appendix 3. Workshop Programme	23
Appendix 4. Interview protocol	25
Appendix 5. Powerpoint slides to introduce the interviews	29
Appendix 6. Powerpoint slides per workshop session	33
Appendix 6.1. Introduction and Priorities as Indicated by Stakeholders	33
Appendix 6.2. Introduction to the BowTie	40
Appendix 6.3. Introduction to the MARBEFES Toolbox	43
Appendix 6.4. Introduction to the Scenarios of Change	45
Appendix 6.5. The Decision Support System (DSS)	49
Appendix 7. Results from Menti-Meter sessions	53
Appendix 7.1.a. Priorities as Indicated by Stakeholders – Original	53
Appendix 7.1.b. Priorities as Indicated by Stakeholders – English translation	54
Appendix 7.2.a. The Decision Support System (DSS) – Original	55
Appendix 7.2.b. The Decision Support System (DSS) – English translation	56



1. Introduction

As part of the MARBEFES project’s WP6 outscaling activities, Milestone 11.1 provides a report that follows the set-up of the WP1 stakeholder consultations, as carried out during a survey at Martinique, France, from November 17th until November 20th 2025. These consultations are a core element of WP1, which is dedicated to ensuring inclusive and effective stakeholder engagement across the project’s Broad Belt Transects (BBTs). Now in the frame of WP6, the exercises at Martinique are intended to assess to what extent the approaches and tools developed until now in MARBEFES can be outscaled to an area outside the regular BBTs in MARBEFES.

In the first phase of stakeholder engagement at Martinique, the WP1 approaches were followed to focus on identifying the “priority components” of the coastal and marine environments within each DA, as perceived by a diverse range of local stakeholders.

At the other BBTs in MARBEFES these engagement activities were performed in 2023. The insights gained during that initial consultation phase have provided valuable input to several other project work packages. The consultation process and findings from these early engagements were documented in Milestones 16 and 17 (Hummel *et al.* 2023a,b) and in the first Annex to the coming Deliverable 1.2 (Hummel *et al.* 2023c).

The second phase of the stakeholder engagement in 2024 was a continuation of that participatory approach, with follow-up consultations being held in each of the BBTs. The key objectives of that round were to review, validate and receive feedback on the outcomes of the first consultations, and to gather stakeholder responses and input on the conceptual tools, such as BowTies, transition pathway scenarios, and a Decision Support System, under development in other work packages. This co-design process was repeated in a nutshell during the workshop in Martinique.

Now, in the final year of the project, WP1 additionally focusses in cooperation with WP6 on outscaling efforts to explore how the tools, methods, and participatory approaches developed within MARBEFES can be applied beyond the original Broad Belt Transects (BBTs), and to assess their transferability and relevance in new socio-ecological contexts. The stakeholder consultations in Martinique are part of these joint WP1-WP6 outscaling activities.

The report and its appendices include the complete results from the interviews, following the approaches developed and used for the first series of stakeholder consultations in all BBTs, the consultations to receive feedback on the first concepts of tools as displayed during the second series of consultations at the BBTs, and the Menti-meter sessions held during the present workshop. Moreover, all slides from the PowerPoint presentations shown, a list of participating stakeholders, and a detailed program outline are presented.

The outscaling aspects of the consultations in Martinique with regard to Governance and Marine Protected areas, initially based on Task 1.2., are reported in more detail in Deliverable 6.3.



2. Materials and Methods

2.1. Preparations

Leading up to the consultations in Martinique, WP1 (HuFoSS), together with WP6 (AkvaplanNiva), conducted extensive preparatory work to ensure the interviews and workshop would be both well-structured and impactful. Below a chronological overview of this preparatory phase is given.

Autumn 2024

- Contact Persons and stakeholders were informed about the upcoming consultations
- Initial discussions covered preliminary ideas regarding the timing, stakeholder selection, methods, and formats.
- WP- and Task leads were requested to provide most up-to-date input on their work (e.g. latest developments and progress, prototype tools to be tested and refined during these consultations etc.).

December 2024

- The consultations were initially planned, together with the contact persons at Martinique, for December 2024. However, due to riots and rebellions at the island the consultations had to be postponed.

September 2025

- A series of communications with the Contact Persons was held to start thinking about resuming logistical arrangements, including location, technical requirements, catering and so on.
- Parallel to the communication with Contact persons, discussions with WP- and Task leads were held on how to refine their contributions to ensure approaches, concepts, frameworks and tools would be effectively presentable to, and testable by, stakeholders, i.e. that they would be “stakeholder-proof”. Also, the interactive parts of the sessions were further discussed and streamlined, including the development of Menti-meter sessions.

October and November 2025

- During the project’s General Assembly in Sevilla that took place from 7 to 9 October 2025, discussions with the Contact Persons at Martinique, and the WP and Task leads, were held to finalize the content and format of the interactive sessions for the stakeholder consultations. In the weeks following the General Assembly, all these sessions were compiled and integrated into one coherent and logical “story-line” that would make sense to the stakeholders and that would remain engaging them throughout the face-to-face interviews during the first 3 days and the subsequent full-day workshop.
- Practical details, such as timing and locations, were thereafter further streamlined with Contact Persons.
- The local Contact Persons at Nova Blue Environment managed the stakeholder invitations through the distribution of flyers translated in the local language (Appendix 2), resulting in 13 participants for the interviews, and 11 for the workshop.
- The stakeholder consultations took place from 17 to 20 November 2025.

2.2. Stakeholder participation

In total during the consultations at Martinique 16 stakeholders participated (Fig. 1, appendix 1).



The Authorities were most represented (Fig. 1.a). With regard to age (Fig. 1.b) there was a high number at the age from 40 to 50 years, which may be related to many stakeholders being involved to the advanced levels in policies and management, and thus later phase of their career (Fig. 1.a). The gender distribution was fully in balance with 50 % female and male participants (Fig. 1.c)

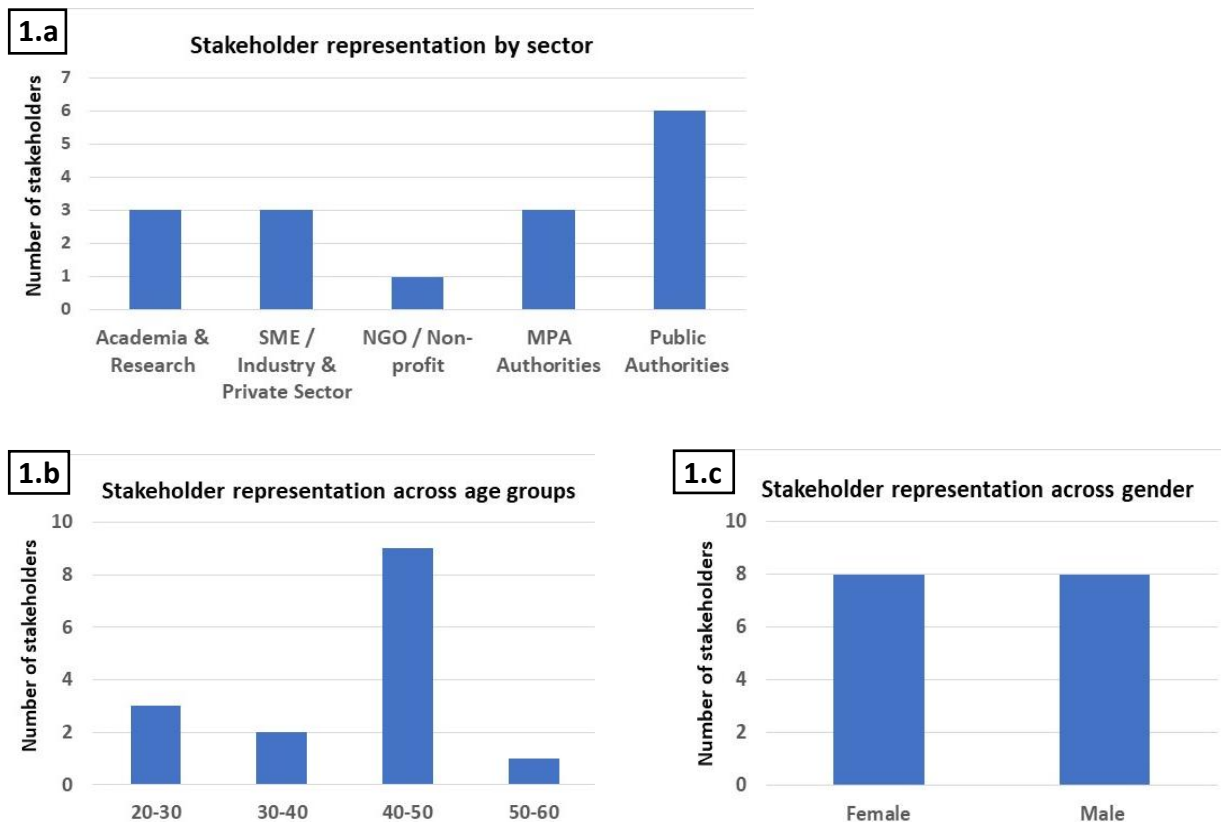


Figure 1. Participation of stakeholders per sector (a), age category (b), and gender (c)

2.3. Stakeholder Interviews

During the interviews on Monday 17 to Wednesday 19 November 2025, the stakeholders were visited at their job locations. After a short introductory presentation (Appendix 5) the stakeholders were asked to share their views on what are for their sector the most important elements in the balance between the ecology (nature), economy, and society in their coastal area, and what are the influences and pressures on this balance.

A full description of the interview procedure is given in the interview protocol (appendix 4).

An overview of the interview results at Martinique is given in chapter 3.1.

An overview of the results obtained through the approaches used in the first year at the regular BBTs all over Europe can be found in chapter 3.1 of Hummel et al 2023a.

2.4. Stakeholder workshop

The workshop on Thursday 20 November 2025 focussed mainly on hands-on practicing and testing with prototypes of the tools that are considered to become useful and usable for a wider group of stakeholders, being the MARBEFES Toolbox, the BowTie approach, and the DSS (Decision Support System) ShinyApp.

The programme is given in Appendix 3.

In the introduction the first results on the interviews performed in the days before were presented which could be helpful

All participating stakeholders provided informed consent via a signed form on location, just prior to the interview or workshop. In addition, HuFoSS verbally communicated that the results of the workshops would be anonymized, and that during the interactive sessions – where stakeholder feedback and input were gathered – only their professional categories were recorded. Individual responses, along with the names or organizations of respondents, remain untraceable, complying with the projects' GDPR and IPR conditions as they were also laid out in the Informed Consent forms.

The workshop spanned a full day, beginning around 10:00 AM and ending around 4:00 PM. The day started with a general welcome, followed by a brief introduction to the objectives of the MARBEFES project and the specific goals of the workshop. Stakeholders were thanked for their participation and informed about the potential benefits of their involvement in the process.

The workshop's agenda covered four distinct sessions, each addressing different topics based on the project's WPs and Tasks. Each session began with a short introductory presentation (appendix 6) followed by an interactive or hands-on segment. During the interactive part, stakeholders were encouraged to provide feedback and input through group discussions and/or Menti-meter surveys (appendix 7). Below is an overview of the workshop sessions, including key topics and details on stakeholder involvement during each session.

A short description of the specific workshop sessions that were discussed in Martinique is given below.

Table 1. Overview of the different workshop sessions, their key topics, and their nature of stakeholder involvement.

Session	Key Topics	Stakeholder Involvement
Priorities as indicated by stakeholders: Insights from 'the interviews	Presentation of findings from the interviews, including key priorities and relationships between elements	Validation and refinement of the results (obtained earlier that week in the interviews) through group discussions and Mentimeter input
The MARBEFES Toolbox	Presentation of the web-design and the wealth of Tools in the MARBEFES Toolbox under development	- Plenary group discussion
The BowTie	- Part one: the BowTie tool as developed for Martinique (presented by the team of Martinique) * - Part two: the BowTie as used for the BBTs in Europe	- Practical work on selecting the key issues in Martinique's coastal system following stepwise the DAPSR approach and major management issues *
Governance of marine biodiversity and Marine Protected Areas.**	- Key issues regarding the governance and the management of Protected Areas in Martinique, in comparison to those in the European BBTs	- Mentimeter questions **
Scenarios of change	- General overview of the impacts on the environment following 3 scenarios of change (SSP1, 3, 5)	- Plenary group discussion



Session	Key Topics	Stakeholder Involvement
Decision Support System	- Overview and testing of the prototype of the ShinyApp for the Decision Support Tool	- Hands-on tool testing and gathering feedback through plenary discussions, and Menti-meter input.

* Sub-session leads Jean-Philippe Marechal and Ewan Tregarot of Nova Blue Environment. All other sessions, except Governance**, led by Herman Hummel and Dominga van der Vliet of HuFoSS.

** Session given by Lea Ricard of AkvaplanNiva in Tromso, Norway, through an online connection. The report on this session is merged with Deliverable 6.3.

An overview of the results obtained during the workshop at Martinique is given in chapter 3.2.



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



3. Results

This section highlights the key findings from the stakeholder consultations and interactive sessions, performed during the interviews on 17 to 19 November, and the workshop on 209 November 2025.

It is important to note that though in total 16 stakeholders have been consulted, and such is an average number participating in the MARBEFES consultations, the results and findings presented in this report should be interpreted with some care and not be considered definitive conclusions or generalizable insights applicable to the full broader population of the island. The perspectives and viewpoints given by the consulted stakeholders just offer valuable indicative semi-quantitative and qualitative input and information into the discussion on marine governance and management priorities in Martinique, and may serve as the basis for a further engagement with a wider range of stakeholders.

3.1. Stakeholder Interviews

The stakeholders at Martinique indicated “Awareness & Knowledge, “Local governance” and “Habitats” as most important elements in the balance between the nature, economic and socio-cultural issues in their coastal environment (table 2). These elements belonged also among the highest scoring for all Europe.

Table 2. The most important elements in the coastal environment of Martinique, according the interviewed stakeholders

Elements (67 in 13 interviews)	Times mentioned (%)	Total connections	Power of connections
Awareness...Knowledge	92	38	183
Local.governance	85	24	97
Habitats	85	40	171
Economy	77	18	84
Local.rules.and.regulations	77	30	119
Pollution	77	24	124
Research	69	17	61
Sanitation	69	18	82
Ecological.dynamics	62	19	75
Small.scale.tourism	54	24	82
Biodiversity	54	27	131
Local.fisheries	46	19	75
Education	46	13	71
Protected.areas	46	20	80
Natural.hazards (sedimentation)	46	19	68
Strategic.plans	46	19	74
Collaboration	46	15	58

Orange cells: Elements for which Martinique is among highest scoring in all Europe. Other colors indicate the most important elements according the criteria given in the Material and Methods



The most important connections between elements at Martinique are Education increasing the Awareness & Knowledge, Local governance promoting Strategic plans, Pollution reducing the Local fisheries, and Pollution decreasing the Habitats (table 3).

Table 3. The most important connections between elements at Martinique

<u>Sending elements</u>	<u>Receiving elements</u>	<u>Frequency</u>	<u>Strength</u>
Education	Awareness...Knowledge	3	15
Local.governance	Strategic.plans	3	15
Awareness...Knowledge	Intrinsic.value.of.nature	3	10
Local.fisheries	Economy	3	10
Agriculture	Pollution	2	10
Awareness...Knowledge	Political.trust...Good.governance	2	10
Communication	Awareness...Knowledge	2	10
Staff...Equipment	Habitats	2	10
Protected.areas	Small.scale.tourism	2	9
Sanitation	Biodiversity	2	9
Climate.change	Natural.hazards	2	8
Large.scale.tourism	Economy	2	8
Protected.Areas	Habitats	2	8
Respect	Urbanisation...Coastal.development	2	8
Disturbance	Habitats	3	-4
Small.scale.tourism	Biodiversity	3	-6
Local.governance	Sanitation	2	-8
Sanitation	Pollution	2	-8
Cultural.heritage...Traditions	Local.rules.and.regulations	2	-10
Disturbance	Ecological.dynamics	2	-10
Habitats	Erosion	2	-10
Pollution	Local.fisheries	3	-12
Pollution	Habitats	3	-14

The obtained information on most important elements and the connections between them, makes it possible to connect several elements together in logical causal chains, such as presented in table 4. In this example, it comes to the foreground that, at Martinique, Agriculture increases the Pollution, which in its turn reduces the Local fisheries and Habitats. Whereas Sanitation may help to reduce the Pollution, whereby Biodiversity would increase. However, in the view of the stakeholders the Local governance does not promote the Sanitation at this moment.

Table 4. Logical causal loop of important elements in the coastal environment of Martinique.

<u>Sending elements >>> Receiving elements</u>		<u>Frequency</u>	<u>Strength</u>
Agriculture	Pollution	2	10
	Pollution	3	-12
	Pollution	3	-14
Sanitation	Pollution	2	-8
Local.governance	Sanitation	2	-8
	Sanitation	2	9



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



3.2. Stakeholder Workshop

The workshop on Thursday 20 November focussed mainly on hands-on practicing and testing with prototypes of the tools that are considered to become useful and usable for a wider group of stakeholders, being the MARBEFES Toolbox, the BowTie approach, and the DSS (Decision Support System) ShinyApp. In the introduction the first results on the interviews performed in the days before were presented which could be helpful.

The further introductory presentations for each session aimed to help to frame the interactive discussions and hands-on testing of the tools. The introductory presentations are included in Appendix 6.

A full account of the original results from the Mentimeter sessions that were held at the end of some sessions, to inventory the opinions and feedback of the stakeholders on the tools, can be found in Appendix 7.

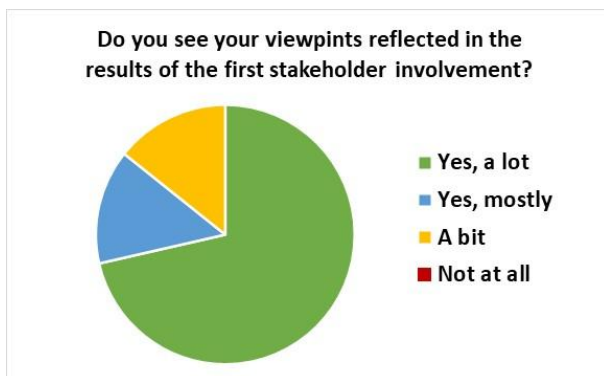
3.2.1. Priorities as Indicated by Stakeholders

The first interactive session was aimed at presenting to stakeholders the findings from the interviews held in the days before, focusing on the key priorities and most important relationships between elements as expressed by stakeholders in the interviews conducted with them.

The introductory presentation is given in Appendix 6.1

Below follows a summary of the results from the stakeholder responses to a couple of Mentimeter questions (appendix 7.1a, 7.1.b).

Q: Do you see your viewpoints reflected in the results of the first stakeholder involvement?



When asked whether their viewpoints were reflected in the initial stakeholder involvement results, the majority of participants found the results to be “a lot,” in line with their perspectives (Fig. 2).

Figure 2. Stakeholder viewpoints reflected in the first round of stakeholder consultations

Q: Were there any results from the stakeholder interviews you found surprising?

None of the stakeholders reported any surprises in the interview results.

Q: Are there any other important elements to add?

In terms of other important elements, while many had nothing further to contribute, a number of participants proposed additional factors: **difference between local and national politics, and sufficient personnel.**

Q. Any other questions or comments?

The participants had no further questions but there were various comments: One of the participants expressed wishes for the **results of the study to be presented to elected officials, funders, and managers**. The other comments expressed **interest in the process of making connections**, seeing the interconnectedness of each element and the **richness and diverseness of the results** from these processes.

3.2.2. The MARBEFES Toolbox and the BowTie

These sessions focused on showing the MARBEFES Toolbox and hands-on applying the BowTie analysis as part of the MARBEFES toolbox. The practical hands-on exercise was delivered by the project partner Nova Blue Environment, with a short introductory presentation provided beforehand by HuFoSS to explain the set-up and wealth of tools in the MARBEFES Toolbox (appendix 6.2) and the purpose of the BowTie tool (appendix 6.3).

For the hands-on exercise on the BowTie tool, stakeholders were divided into smaller groups and provided with large sheets of paper, each containing a different central event considered a concern for the coastal and marine environment in Martinique. Stakeholders were then asked to discuss collectively and draw the Bow-Tie structure on the paper, placing the causes (activities, pressures) and preventative measures on the left, and the consequences with possible mitigation actions on the right of the central event. The BowTie diagrams created during this session were photographed and collected by Nova Blue Environment for further processing and integration into the tool.

3.2.3. Governance and Marine Protected Areas

The purpose of this session was to gather stakeholders' perspectives on the results of previously held interviews on Governance and Marine Protected Areas (MPAs).

The session was presented and led through an online connection by our project partner Akvaplan-Niva, who had performed the interviews with stakeholders online in the summer of 2025, and hence the presentation, the Mentimeter session and its results are presented and published in a separate report, i.e. Deliverable 6.3, by Akvaplan-Niva.

3.2.4. Scenarios of Change

During the presentation the three scenarios for plausible future changes in our environment that are included in the MARBEFES project (SSP1: Sustainability, SSP3: Regional Rivalry, SSP5: Fossil-fueled) were introduced to the stakeholders (Appendix 6.4). Per scenario the general policy to follow the scenario were given, including a scale for the investment costs and economic growth. Furthermore the scenarios were linked to CO2 emissions and temperature rise for the coming 100 years.

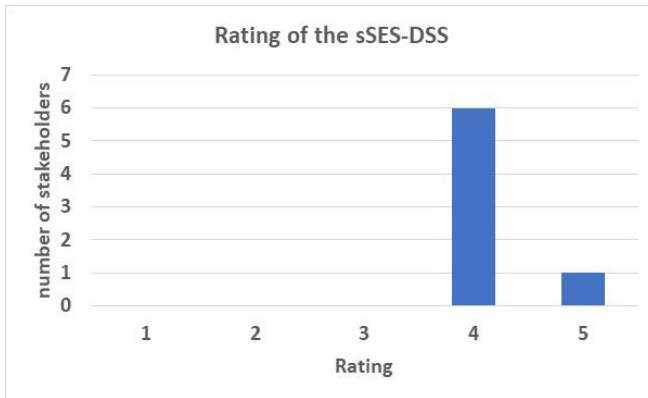
In a short plenary discussion the ins and outs of the scenarios and the meaning for Martinique were shortly discussed.

3.2.5. Decision Support System

This session was aimed at the stakeholders testing, in a hands-on exercise, the ShinyApp of a prototype of the Decision Support System (DSS) tool, based on the Social Ecological Systems (SES) and DAPSIWRM approaches. After the introductory presentation (appendix 6.5), and the testing, the stakeholders could give feedback through a Mentimeter survey (appendix 7.2.a, 7.2.b).



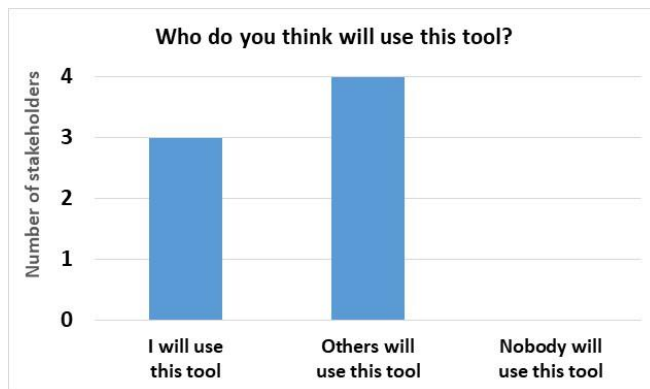
Q: How would you rate this tool? (1-5)



The DSS tool received a high score (Fig. 3; average rating of 4.1 on a scale of 1 to 5), showing a relatively high appreciation for the Decision Support System.

Figure 3. Rating of the Decision Support System by stakeholders.

Q: Who do you think will use this tool?



All of the stakeholders thought this tool will be used, either by themselves or others.

Figure 4. Users of the tool.

Q: Why would you use this tool?

Reasons stakeholders would use this tool varied. Stakeholders mentioned the tool's usefulness in **asset management, justifying certain management measures or prioritisation of actions**. Other reasons for the use of this tool were its ability to **visualise levers for action** and to **represent interactions with complex systems**.

Q: Why would you NOT use this tool?

The majority of potential reasons that would cause stakeholders not to use this tool were about the **lack of a user-friendly interface**, and the **need to simplify its use**. During the session, stakeholders were concerned it would take "a very long time to well understand this tool" and "learn how to use it".

Q: What elements are missing in the tool?

In terms of missing elements, while many had nothing further to contribute, a number of participants proposed "a **user manual**" for the tool and the "**explanatory aspect of what the diagrams represent**".

Q: Could you specify any terminology or phrasing used within the tools that you found unclear or difficult to understand?

For this question, some participants expressed the **need for more time and practice exploring of the tool** to have a judgement on the terminology or phrasing used in it. Another comment was that **the risks and hazards section** of the tool to be “not exhaustive or too general”. Furthermore, other unclear terminology mentioned was: “physiogeography” and “microbial”. Some stakeholders noted these challenges were most probably linked to poor system translation into French.

Q: What questions would you use this tool to answer in your daily work?

While the need for more time to explore the tool was again mentioned, participants noted various questions for which they believed the tool could help find an answer to: **“Which actors are working on this topic? Who has a role in this issue? How to mobilize elected officials?”** Others believe the tool will find better solutions for management and show the interactions between different projects or how can help them prioritize their actions, though not necessarily on a daily basis.

Q: Any other questions or comments?

For the last question, while many had nothing further to contribute, one participant expressed their wish for a manual guide on the tool.



4. Discussion and Conclusions

The elements viewed by the stakeholders as most important in determining the balance in their ecological, economical and socio-cultural environment at Martinique, or being threats to it, are: Awareness & Knowledge, Local governance, Habitats, Local rules & regulations, Economy, and Pollution.

These elements belong in general also to the top elements at other European locations. Yet, the first four (4) elements score amongst the highest in the degree of importance for all Europe, which may indicate that the viewpoints of the stakeholders at Martinique is, more than at other European locations, strongly directed towards Local issues, next to the urge of a high awareness and knowledge on their unique habitats.

In the workshop the stakeholders in majority confirmed the conclusions drawn from the interviews. An additional interest was expressed to see the interconnections between the elements. An onset to such interconnections between elements could be shown already during the workshop through the hands-on exercises with BowTie and the SES-DSS tool. As such in particular the SES-DSS was highly appreciated as a useful tool to understand the interconnections and balance in their environment. Moreover, in their opinion the tools presented would be useful for themselves and for others, especially in management, though the tools should be simplified and become more user-friendly.

One of the goals of this workshop, as part of the stakeholder consultations in Martinique was to contribute to the outscaling activities and the overarching goals of co-design in MARBEFES. The general conclusion is that the workshop in the Martinique has indeed served to be instrumental in helping to advance those MARBEFES' key objectives, in several ways, notably by stakeholders actively contributing to refine the interconnections between the most important elements in their coastal system, through discussions on system priorities and causal relationships, and to advice on the further design and practical relevance of the tools for science, management, and practitioners.

It altogether showed that the approaches and tools developed in the European BBTs were equally relevant and applicable to the situation at Martinique.



5. Acknowledgements

We would like to express our gratitude to all participants who contributed their time, insights, and expertise to the stakeholder consultations in Martinique, France. Their valuable input has played an essential role in shaping the results presented in this report. We appreciate the openness, engagement, and constructive feedback shared during the sessions, which greatly enriched the discussions and results.

Additionally, we would like to thank our local contact points Jean-Philippe Maréchal and Ewan Trégarot of Nova Blue Environment, who facilitated the stakeholder outreach and invitations, ensuring the successful participation of a diverse group of stakeholders. Their efforts in coordinating the consultations were essential to the overall process.

Finally, we acknowledge the funding support for the MARBEFES project, which has made this important work possible. MARBEFES is funded by the European Union’s Horizon Europe programme under grant agreement No. 101060937.



The MARBEFES project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354’



6. References

- Hummel C, J van der Meer, K Timmermans, H Hummel, 2022. The use of Fuzzy Cognitive Models to strengthen stakeholder participation in the management of Protected Areas: the Dutch Wadden Sea. In: C. Hummel. The use of the Ecosystem Service approach in Protected Area management. PhD thesis, VU Amsterdam, pp 79-102.
- Hummel, H., Koopman, J., Thijssen, B., Sturm, B., Segeren, R. (2023a). Stakeholder involvement: An example of flexible Planning and first Results of the First Surveys. MARBEFES. Milestone 16.0. HuFoSS, Roosendaal, NL, pp. 29.
- Hummel, H., Koopman, J., Thijssen, B., Sturm, B., Segeren, R. (2023b). Stakeholder involvement: Second series of Surveys - Crete and Mallorca. MARBEFES. Milestone 17.0. HuFoSS, Roosendaal, NL, pp. 23.
- Hummel, H., Segeren, R., Sturm, B., Thijssen, B. (2023c). MARBEFES First Annex to Deliverable 1.2. Stakeholders' Recommendations regarding harmonization and integration of social-ecological Frameworks. HuFoSS, Roosendaal, NL, pp. 183. (also: Marine SABRES Deliverable 2.1 Simple SES design brief).



Appendices

The following pages contain appendices:

Appendix 1. provides a list of all stakeholders who participated in the workshop held in Martinique

Appendix 2. gives the informative flyer send to potential stakeholders

Appendix 3. provides the workshop programme

Appendix 4. presents the interview protocol

Appendix 5. gives the introductory presentation, shown at the start of each interview

Appendix 6. (Sections 6.1 to 6.5) presents the PowerPoint slides that were shown to stakeholders during the workshop

Appendix 7. (Sections 7.1.a to 7.2.b) contains, in chronological order, the results of the Mentimeter sessions conducted throughout the workshop, including the English translations



Appendix 1. Stakeholder Participation List

MARBEFES Martinique				Consent		Way of acknowledgement	Date	Presence	
Stakeholder-nr	Name	Category	Institute/Firm	Partners	Third parties			Interviews	W
MA01	Délice Nouel	SME / Industry & Private Sector	Dénébola	yes	yes	Délice Nouel - Dénébola	17/11/2025	yes	
MA02	Jesicca Crillon	MPA Authorities	Parc Naturel Marin de Martinique	yes	yes	Parc Naturel Marin de Martinique	17/11/2025	yes	
MA03	Christelle Beranger	MPA Authorities	Parc Naturel Régional de la Martinique	yes	yes	Christelle Beranger - Parc Naturel Régional de la Martinique	17/11/2025	yes	
MA04	Axelle Lefaucheur	Academia & Research	Office francais de la biodiversité - Parc Naturel Marin de Martinique	yes	yes	Axelle Lefaucheur	17/11/2025	yes	
MA05	Laurent Louis-Jean	MPA Authorities	Parc Naturel Régional de la Martinique	yes	yes	Laurent Louis-Jean- Parc Naturel Régional de la Martinique	18/11/2025	yes	
MA06	Aymeric Barlet	Public Authorities	Grand Port Maritime de la Martinique	yes	yes	Aymeric Barlet - Grand Port Maritime de la Martinique	18/11/2025	yes	
MA07		Public Authorities		yes	yes	Anonymous	18/11/2025	yes	
MA08	Jean-Raphaël Gros-Desormeaux	Academia & Research	CNRS	yes	yes	Jean-Raphaël Gros-Desormeaux - CNRS	18/11/2025	yes	
MA09	Adeline Pouget Cuvelier	SME / Industry & Private Sector	SeaLens	yes	yes	Adeline Pouget Cuvelier - SeaLens	18/11/2025	yes	
MA10		Public Authorities		yes	yes	Anonymous	18/11/2025	yes	
MA11	Mathilde Brassy	Academia & Research	Carbet des Sciences	yes	yes	Mathilde Brassy - Carbet des Sciences	18/11/2025	yes	
MA12	Gabriel Conesa de Warlincourt	Public Authorities	CACEM	yes	yes	Gabriel Conesa de Warlincourt	19/11/2025	yes	
MA13	Solenn le Hyaric	Public Authorities	Direction de la mer de Martinique	yes	yes	Direction de la mer de Martinique	19/11/2025	yes	
MA14	Jonathan Priam	Public Authorities	Office de l'Eau Martinique	yes	yes	Jonathan Priam - Office De l'Eau Martinique	20/11/2025		
MA15	Gérald Darnis	NGO / Non-profit	Sové Lavi Saline, Konnect West Indies	yes	yes	Gérald Darnis	20/11/2025		
MA16	Renaud Leroux	SME / Industry & Private Sector	Pelicam Productions	yes	yes	Renaud Leroux	20/11/2025		

* HH= Herman Hummel, DV = Dominga van der Vliet, JM = Jean-Philippe Marechal, EW = Ewan Tregarot




The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Appendix 2. Flyer send to potential stakeholders



 MARBEFES a reçu un financement du programme de recherche et d'innovation Horizon Europe de l'Union européenne, dans le cadre de la convention de subvention n° 101060937




Qu'est-ce que MARBEFES ?
 MARBEFES est un projet européen de 4 ans qui étudie les liens entre la **biodiversité marine** et les **biens et services** fournis par les écosystèmes marins, afin de développer des outils de gestion et de décision basés sur la science

MARBEFES regroupe 22 instituts de recherche issus de 15 pays européens, allant des rivages de la Méditerranée aux côtes océaniques d'Europe de l'Ouest, en passant par la mer Baltique saumâtre et l'archipel glacé du Svalbard.

Pour renforcer les liens entre recherche, politique et gestion, nous plaçons toutes les parties prenantes – y compris les usagers de la mer – au cœur du projet.

Nous aimerions que vous vous impliquiez ...



20



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





MARBEFES a reçu un financement du programme de recherche et d'innovation Horizon Europe de l'Union européenne, dans le cadre de la convention de subvention n° 101060937



Etre partie prenante du projet MARBEFES ?

Votre participation est centrale pour le projet. MARBEFES vise à permettre aux communautés côtières de prendre des décisions éclairées conciliant besoins humains et écologiques.

Nous voulons comprendre comment vous, acteur de la mer et du littoral, percevez les relations entre la mer, la société et l'économie. Cela permettra de mieux refléter tous les intérêts dans les outils d'aide à la décision. C'est pourquoi nous faisons appel à des représentants issus de divers secteurs pour partager leur point de vue.

Pour que les politiques environnementales marines et la gestion côtière de demain soient adaptées aux besoins des citoyens et des acteurs locaux, votre contribution est indispensable.

Ce projet vous offre l'opportunité de faire évoluer les politiques publiques qui concernent votre cadre de vie, pour un avenir durable et prospère.

Toutes les parties prenantes sont invitées à partager leur vision des enjeux écologiques, économiques, sociaux et culturels de l'environnement marin et côtier à travers un entretien en 2025.





MARBEFES a reçu un financement du programme de recherche et d'innovation Horizon Europe de l'Union européenne, dans le cadre de la convention de subvention n° 101060937



Partie prenante

Activités

- Participer aux interviews (Juin - 2025)
- Atelier de travail (Juin 2025 et 2026)
- Test et retour d'expérience sur les résultats du projet (2026)

Temps à consacrer

- Interview 2025: ~ 1 heure
- Ateliers 2025 and 2026: sur une journée
- Test/retour d'expérience sur les résultats finaux (2026): ~ 3heures – Restitution.

Protection de vos données personnelles

MARBEFES et ses partenaires respectent la vie privée des participants et s'engagent à traiter toutes les informations personnelles conformément aux règlements RGPD et IPR. Vos données ne seront jamais rendues publiques sans votre consentement explicite.

Votre accord sera sollicité au début de l'entretien ou de l'enquête, via un protocole écrit qui vous sera transmis à l'avance.

Time Investment

Si vous souhaitez participer en tant que partie prenante au projet MARBEFES, merci de transmettre vos coordonnées à la personne contact impliquée dans le projet.

(Jean-Philippe MARECHAL marechal.jean@gmail.com)



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Appendix 3. Workshop Programme



Nova Blue Environment et HuFoSS, avec le soutien du PHEEAC et son institut IRCAB (*institut de recherche Caraïbes-Amériques biodiversité*) ont le plaisir de vous accueillir pour un atelier de travail dans le cadre du projet de recherche Européen MARBEFES (MARine Biodiversity and Ecosystem Functioning leading to Ecosystem Services).

Atelier MARBEFES

Jeudi 20 novembre 2025 de 09h00 à 17h00

Université des Antilles

09h00 – 09h20 Mot de bienvenue & introduction

- Présentation du projet MARBEFES (10 min)
- Contexte de la Martinique : la dégradation des récifs coralliens (Jean-Philippe Maréchal)

09h20 – 10h50 Activité de groupe 1 : Bow-Tie récifs coralliens

- Présentation de l'outil Bow-Tie (causes → événements centraux → conséquences → mesures de contrôle) (Herman Hummel)
- Travail en groupe afin de co-développer / valider les Bow-tie sur les récifs coralliens

10h50 – 11h05 Pause-café

11h05 – 11h30 Discussion sur les Bow-tie réalisés

- Discussion sur certains points qui pourront être soulevés après l'exercice (animation : Jean-Philippe Maréchal, Ewan Trégarot)

11h30 – 12h00 Restitution des enquêtes AMP & Gouvernance

- Présentation en visio des résultats d'enquêtes réalisé cet été sur les challenges, visions et solutions autour des Aires Marines Protégées et de la Gouvernance (Léa Ricard)





12h00 – 13h30 **Pause déjeuner (déjeuner offert)**

13h30 – 14h00 **Cartographie mentale**

- Présentation de la méthode de Cartographie mentale et des résultats issues des entretiens réalisés du 17 au 19 novembre (Herman Hummel et Dominga van der Vliet)

14h00 – 16h00 **Activité 2 : Déclinaison locale des scénarios (Scénario Downscaling)**

- Présentation de l'outil et des trajectoires socio-économiques partagées - SSP1, 3, 5 (10 minutes - Herman Hummel)
- Travail de groupe afin de co-développer, valider les scénarios (par exemple, indiquer si les activités identifiées sur les Bow-ties augmenteront, diminueront ou resteront stables dans le futur).

15h30 – 16h00 Outils d'aide à la décision

- Présentation outils d'aide à la décision, tel que le *Causal Loop Diagram* (Herman Hummel)
- Exemple sous-sections du Bow-Tie (JPM)

16h00 – 16h15 **Pause-café**

16h15 – 16h45 **Exploitation des outils**

- Présentation des analyses possibles à la suite des Bow-Ties et de la déclinaison locale des trajectoires socio-économiques partagées à partir du travail réalisé lors de l'atelier.
- Présentation des Bow-Tie Mangroves et Herbiers
- Discussion ouverte autour des mesures de prévention et mitigation

16h45 – 17h00 **Conclusion**

- Conclusion de l'atelier (équipe MARBEFES)



Appendix 4. Interview protocol

The purpose of the interview is to obtain better insight into the status and management of the marine and coastal area in question. To this end, the stakeholders' perceptions are inventoried regarding the most important natural, social and economic aspects and interactions in their coastal environment, and the most important pressures that impact these relations. Such insight is needed in order to be able to integrate stakeholders' views and opinions in the environmental policy and management tools to be developed. Taking into account stakeholder interests is vital to the realization of sustainable and efficient policy and management with public support.

What

To map stakeholders' perceptions, interviews are conducted in which "Fuzzy Cognitive Modelling" is employed following Hummel *et al.* (2022). Herewith elements (i.e. all factors, actors, or processes) being perceived important by the stakeholder are depicted in diagrams as nodes that are connected with arrows showing the direction and strength of influence between the elements as perceived by the interviewed stakeholder (see below example (fig. A) adopted from Hummel et al 2022)

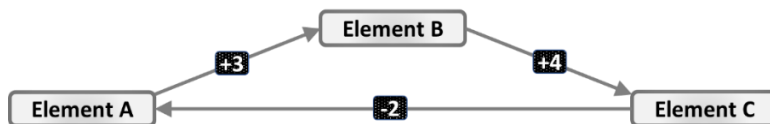


Figure A: An example of the Fuzzy Cognitive Model whereby Elements such as factors (e.g. fish), actors (e.g. policies) or processes (e.g. eutrophication) form nodes in the diagram. Related Elements are connected with arrows (vectors) showing the direction and strength of influence between these Elements. The values of the vectors (ranging from -5 to +5) indicate the strength of the influence. An arrow with a positive value pointing from element A to element B indicates that element A increases or stimulates element B, and a negative arrow from element C to element A indicates that element C decreases element A. In this example a feed-back mechanism can be seen as element A increases element B which increases element C, which in turn decreases element A.

The interviews are held in person with participant(s), possibly at the premises of the stakeholder themselves, lasting about 1 hour per interview. The interviews are not based on a set of questions, yet instead interviewees are free to share what they think is important with minimal interference by the interviewer.

After a brief introduction of the project and the purpose and outline of the interview, participants will be asked to share their views on the following question: "What are for your sector the most important elements in the balance between the ecology (nature), economy, and society in their coastal area, and what are the influences and pressures on this balance".

How

The interview consists of two phases. In the first 15 minutes to half an hour, participant(s) share their views on the above-mentioned issues with a minimum of interference from the interviewers. The important factors raised by the stakeholder are noted down as keywords. In the second phase, the keywords are indicated on cards, and the participant(s) can indicate the relationships between the different keywords (factors) with arrows (vectors). Relationships can indicate either positive or negative influences and should receive a rank that can range from -5 to +5). This exercise maps otherwise 'fuzzy' stakeholder knowledge, uncovering which factors are perceived as important, and how they are thought to interrelate. The total duration of the interview was each time about 1 hour.

Please note that stakeholders may be represented by more than one person, i.e. with one or two colleagues.

The interview team consists of the following:

- Interviewer
- Note-taker

The following attributes are used:

- 2 Magnetic whiteboard sheets, 100cm by 45 cm
- 25 Magnetic whiteboard ‘sticky-notes’, different colors
- Whiteboard markers, different colors
- Paper notebook and pencils

Aspects to take into consideration:

Before the interview

- Make sure the interview takes place in a calm environment
- Clear the table/desk so all attributes can be placed on the table
- Make sure participant(s) feel comfortable and are familiar with the procedure

First phase of interview

The interviewer repeats the aims of the interview, and then gently can guide the interview by repeating, confirming, or rephrasing what has been said by the interviewee. It is important that the interviewer does not steer the conversation too much and refrains from putting words in somebody’s mouth. The note-taker listens carefully and writes down the most important factors mentioned as keywords on paper (10 to 30 words), taking care not to distract the participant(s).

Second phase of interview

When the stakeholder has finished speaking, they can take a 5 to 10 minutes break. In the break, the interviewer and note-taker agree on the list of keywords and write them down on separate magnetic-cards.

The magnetic-cards with keywords are then placed on a big magnetic sheet (of about 50 cm high and 100 cm wide). The cards are positioned on the magnetic sheet in an open oval-shape. If possible the cards are preordered into 4 categories: **Green** cards for ecosystems and nature (to the left of the magnetic sheet), **Blue** for the blue-economy, **Orange/Yellow** for social, governmental and cultural keywords and **Red** for pressures (to the right of the big sheet).

The participant(s) are asked if they agree on the final placement of the magnetic-notes, and if they want to add a keyword or merge two or more words, this is allowed.

- Note name, date and profession of the stakeholder on the magnetic sheet
Take a picture at this stage to prevent coincidental loss of keywords by wiping them out at the cards once touching and repositioning them in this second stage.

Take care to explain the procedure again.

Participant(s) are then asked to draw arrows between keywords to indicate relationships between them, which can be either positive or negative influences. Relationships should be ranked on a scale from -5 to +5.



The procedure can be started by asking participant(s) what they think are the most important relationships and interaction between the given keywords. When to the opinion of the interviewee all important relationships have been pointed out with arrows, and ranked, the exercise is complete and the interview is finished.

An example of the final FCM network is presented in the diagram (fig. B) given below

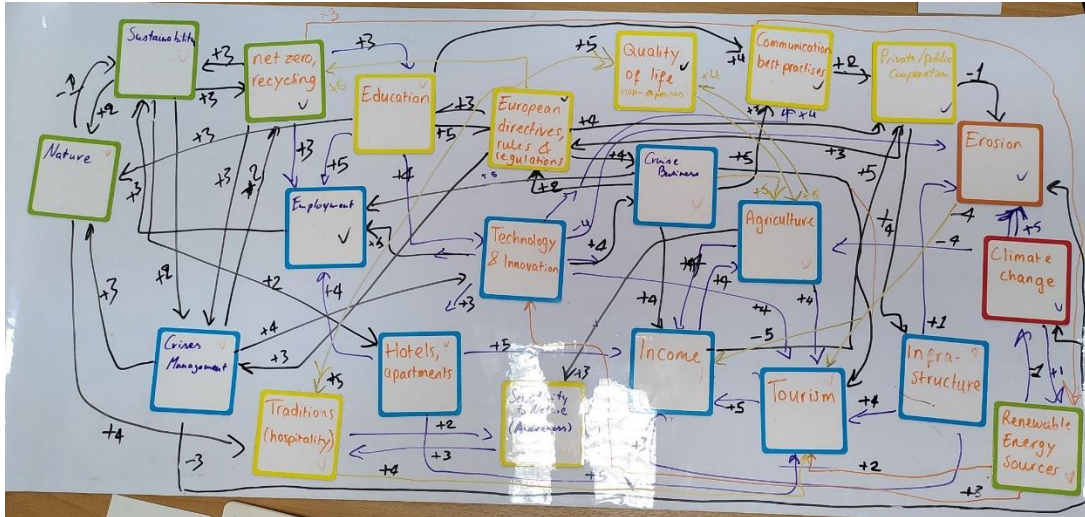


Figure B. Example of a FCM network composed by a stakeholder, in this specific case resulting in a mind-map with 22 elements and many more interactions (vectors) between the elements.

Before finalizing the interview session:

- Check whether all the keywords are connected to at least one other word
- Check whether there are no 'islands', that may occur when a group of words isn't connected to the rest of the scheme
- Take a picture of the completed sheet, don't forget to include name, date and profession of stakeholder
- Save all pictures carefully and email them to yourself and colleagues.

Data processing

Since different stakeholders used various synonyms for factually similar elements in their FCM diagrams, these elements were harmonised. For example, biodiversity, species diversity, and species, were all called biodiversity. These harmonisation resulted in 92 different elements, which were further used to analyse the main characteristics of these FCM networks.

On basis of the harmonised elements and connections a set of indices was calculated to characterise the stakeholder's FCM networks.

To arrive at a practical set of elements that forms the core for further development of tools, discussions, and for management, a set of important elements has been selected whereby the degree of importance or strength of the elements was taken into account. The selection procedure took into account that elements that were important in only one research area also would become visible.

The selection included the following:

- for individual elements:

- 1) the frequency an element was mentioned among stakeholders. The frequency had to be at least 50 % among the interviews taken in a research area, or

- 2) the number of connections (vectors) from or to an element. The element had to have a number of vectors that is equal or higher than 50 % of the highest number from/to an element obtained in that area, or
- 3) the centrality, i.e. the strength it was connected to other elements. The average strength (on a scale from 1 to 5) of the vectors from or to an element had to be equal or higher than 50 % of the highest strength from/to an element obtained in that area.

- for combinations (pairs) of elements:

- 4) the combination of elements (a pair) had to be indicated in at least two or more interviews in the specific research areas, and to be indicated in an equal or higher number of interviews than 50 % of the highest number for a combination of elements obtained in that area, or
- 5) the receiving element in combinations had to belong to the top 30 on basis of the number of incoming vectors, or
- 6) the sending element in combinations had to belong to the top 30 on basis of the number of outgoing vectors.

The selection criteria yield by using an “or-or” approach, instead of “and-and”, as much as possible an inclusive overview to indicate what the important elements are in the various research areas.



Appendix 5. Powerpoint slides to introduce the interviews



MARBEFES
WP 1: Stakeholder involvement and governance rules
&
WP 6: Outscaling

Herman Hummel, Vivien Laros, Hanie Matajinimvar, Jane van Wechem, Dominga van der Vliet
HuFoSS, Roosendaal, the Netherlands

Sabine Cochrane, Charlotte Weber, Ingvild Ytterhus Utengen, Lea Ricard
Akvaplan-Niva, Tromso, Norway

In cooperation with:
Jean Philippe Maréchal, Ewan Trégarot
Nova Blue Environment, Schoelcher, Martinique, France



MARBEFES has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937



Content

- **Overview and aim of the project**
- **Where do we operate ?**
- **Timeline of the project**
- **Survey and Interview**



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





Overview and aim of the project

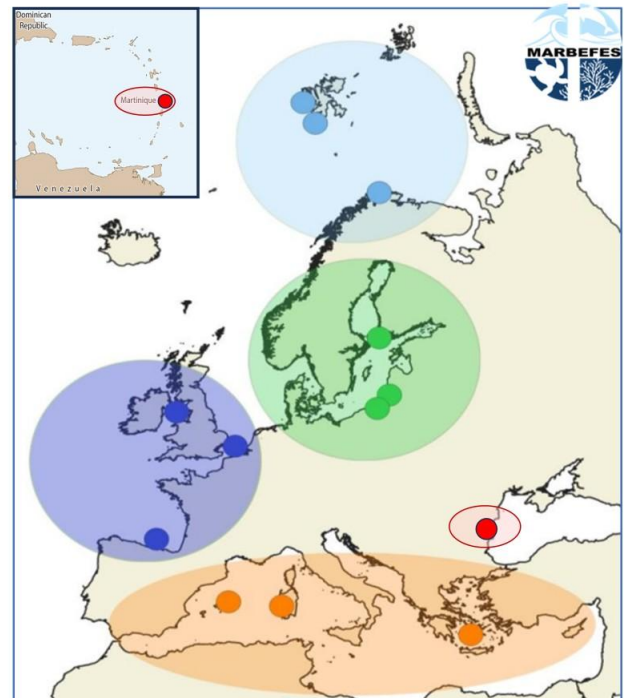


- **INTERNATIONAL & INTERDISCIPLINARY:**
 - 22 Research partners with different expertise
 - from 11 European countries
- **TOOLS AND INSTRUMENTS:**
 - We will develop tools and instruments
 - with and for users
 - to allow for better decision-making, governance, and management of the coastal area and the sea
 - to obtain a sustainable balance between nature, economy and society and the pressures acting on it.
- **STAKEHOLDERS:**
 - A wide range of stakeholders is included (e.g. fishermen, hotel owners, policy makers, industries, private sectors, scientists etc.)
 - Stakeholder's opinion central (no interference from our side)
 - All on voluntary basis



Where do we operate ?

- **BBT 1: Arctic**
 - Porsangerfjord, Norway
 - North and South Spitsbergen
- **BBT 2: Baltic**
 - Baltic Archipelago, Finland
 - Curonian Lagoon, Lithuania
 - Gulf of Gdansk, Poland
- **BBT 3: Atlantic**
 - Dogger Bank Belgium
 - Liverpool-Dublin bay
 - Bay of Biscay, Spain
- **BBT 4: Mediterranean**
 - Balearic Sea
 - Sardinia
 - Gulf of Heraklion
- **Outscaling**
 - Black Sea
 - Martinique





Timeline of the project

- We may visit you in the coming years for further feedback, if you wish so
- You can also be involved in the co-design of the project
- It is all on voluntary basis

YEAR 1 – 2023

First round of interactive surveys and interviews with stakeholders

YEAR 2 / 3 – 2024 / 2025

- Feedback and evaluation by stakeholders on the results, tools and solutions obtained in year 1
- **Outscaling of the results, tools and solutions**

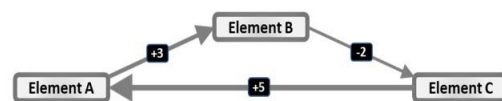
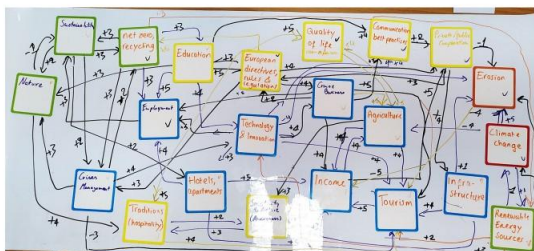
YEAR 3 / 4 – 2025 / 2026

Final round of feedback by stakeholders for the tools and instruments to be finalised



For now - INTERVIEW

- Open-ended conversation
- You, as stakeholders, are asked to talk about the important topics and elements that influence the balance between the ecology (nature), economy, society, and pressures in your coastal area
- Approximate time: 1 hour per interview





MARBEFES has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937

Thank you
and let's start now !



@MARBEFES



@MARBEFES



Linkedin.com/company/MARBEFES



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Appendix 6. Powerpoint slides per workshop session

Appendix 6.1. Introduction and Priorities as Indicated by Stakeholders

MARBEFES

MARine Biodiversity and Ecosystem Functioning leading to Ecosystem Services

2nd Round of Stakeholder Consultations

Stakeholder appraisal and feedback on WP outcomes

Martinique
November 2025

Herman Hummel, Hanie Matajinimvar, Vivien Laros, Dominga van der Vliet
HuFoSS, Roosendaal, the Netherlands

MARBEFES Project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no 101060937 and UKRI under Grant Agreements 10040216, 10048815 and 10041354

HuFoSS
For a sustainable future

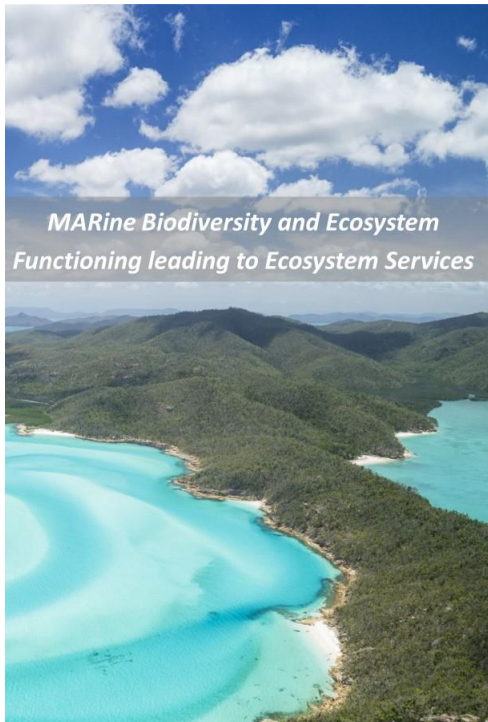
Welcome to the MARBEFES workshop for Stakeholders

The Stakeholder Workshop follows a Storyline

- ❖ **The main aim: Balancing biodiversity, ecosystem functions, and social-cultural and economic values in coastal marine areas**
 - For whom, and what is there in for you
- ↓ **Priorities as indicated by Stakeholders**
- ↓ **BowTies to connect important factors**
- ↓ **Scenarios of change**
- ↓ **Governance of marine biodiversity**
- ↓ **Marine Protected Areas (MPAs)**
- ↓ **Decision Support System**

MARBEFES

HuFoSS
For a sustainable future



Overview and aim of MARBEFES



- **INTERNATIONAL & INTERDISCIPLINARY:**
 - 22 Research partners with different expertise
 - from 11 European countries
- **TOOLS AND INSTRUMENTS:**
 - We will develop tools and instruments
 - with and for users
 - to allow for better decision-making, governance, and management of the coastal area and the sea
 - to obtain a sustainable balance between nature, economy and society and the pressures acting on it.
- **STAKEHOLDERS:**
 - A wide range of stakeholders is included (e.g. fishermen, hotel owners, policy makers, industries, private sectors, scientists etc.)
 - Stakeholder's opinion central (no interference from our side)
 - All on voluntary basis





MARBEFES aims to:

- understand the link between biodiversity, ecosystem functions, and services
- show how coastal ecosystems provide essential benefits to society
- assess these benefits through different methods of valuation, both monetary and non-monetary!
- recommend strategies to enhance ecological and economic value

Together with YOU, we will:

- identify key priorities for your coastal environment
- address ecological, social, and economic challenges
- develop practical tools for management, policy, and decision-making



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





Benefits of engaging with MARBEFES

- Explore a **holistic approach** to environmental challenges.
- Embed **your local knowledge** in the consultation process
- Voice **your priorities and concerns**, to be included
- Compose together **practical tools** that are useable and useful, **for YOU**



*MARine Biodiversity and
Ecosystem Functioning
leading to Ecosystem Services*

Priorities as indicated by stakeholders: Insights from “1st round” of consultations

Herman Hummel, Hanie Matajinimvar, Vivien Laros, Dominga van der Vliet
HuFoSS, Roosendaal, the Netherlands



MARBEFES Project has received funding from the European Union’s Horizon Europe research and innovation programme under grant agreement no 101060937 and UKRI under Grant Agreements 10040216, 10048815 and 10041354



The MARBEFES project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354’

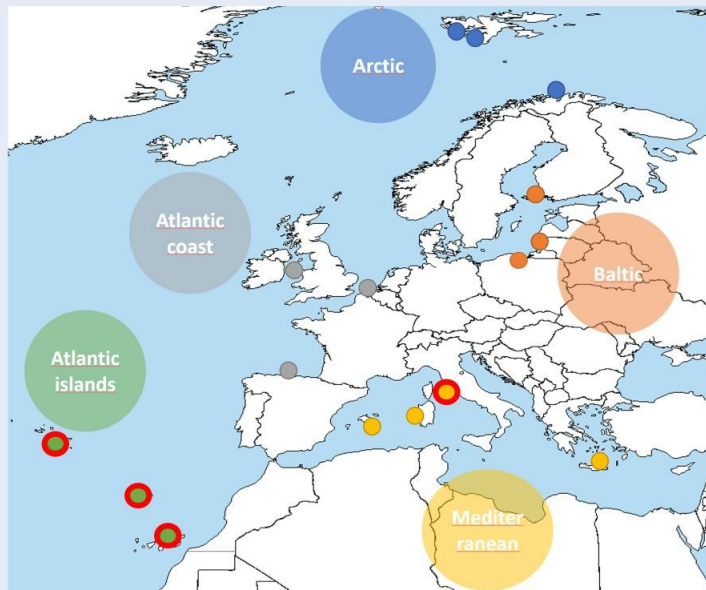


Stakeholder surveys & Stakeholder interviews:

Together in the sister-projects MARBEFES and Marine SABRES 

Content:

- Aims
- Methods used
- Interview results
- Mentimeter



Summary of the goals in first year (2023):

- Stakeholder engagement through interviews and surveys
- Main question:
What are the most important elements in the balance between the ecology (nature), economy, and society in your coastal area, and what are the influences and pressures on this balance?
- We have measured the perceptions of stakeholders

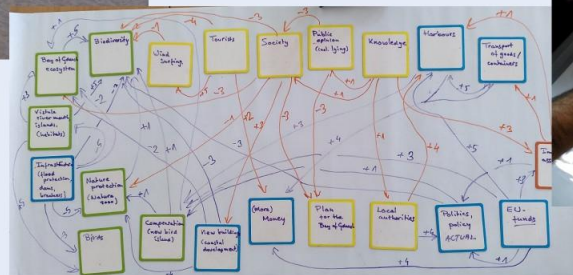
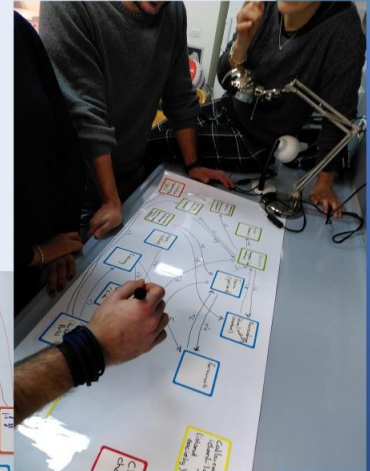
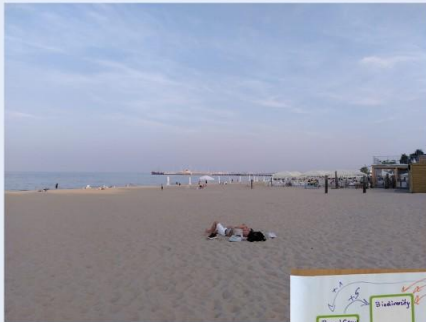


The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





Stakeholder interviews

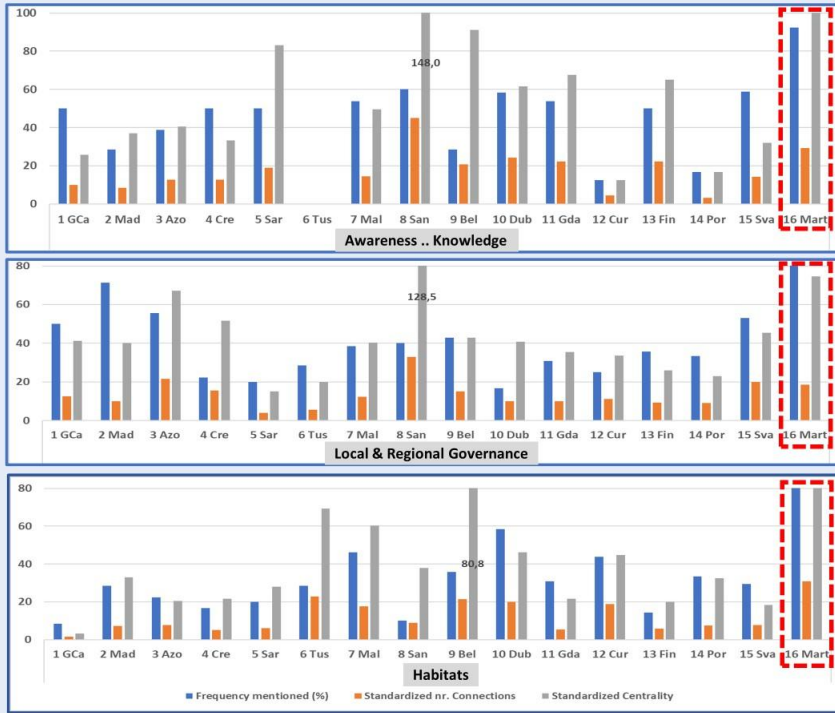


Most important elements in Martinique

Elements (67 in 13 interviews)	Times mentioned (%)	Total connections	Power of connections
Awareness...Knowledge	92	38	183
Local.governance	85	24	97
Habitats	85	40	171
Economy	77	18	84
Local.rules.and.regulations	77	30	119
Pollution	77	24	124
Research	69	17	61
Sanitation	69	18	82
Ecological.dynamics	62	19	75
Small.scale.tourism	54	24	82
Biodiversity	54	27	131
Local.fisheries	46	19	75
Education	46	13	71
Protected.areas	46	20	80
Natural.hazards (sedimentation)	46	19	68
Strategic.plans	46	19	74
Collaboration	46	15	58

Elements for which Martinique is among highest





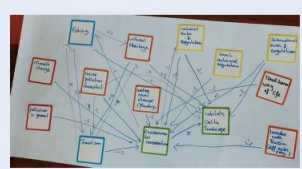
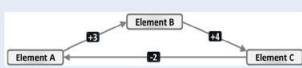
Martinique scores the highest in comparison to Europe for:

- Awareness & Knowledge
- Local & Regional Governance
- Habitats

and several other elements



Most important relationships between elements in Martinique



Mind-map

Sending elements	Receiving elements	Frequency	Strength
Education	Awareness...Knowledge	3	15
Local.governance	Strategic.plans	3	15
Awareness...Knowledge	Intrinsic.value.of.nature	3	10
Local.fisheries	Economy	3	10
Agriculture	Pollution	2	10
Awareness...Knowledge	Political.trust...Good.governance	2	10
Communication	Awareness...Knowledge	2	10
Staff...Equipment	Habitats	2	10
Protected.areas	Small.scale.tourism	2	9
Sanitation	Biodiversity	2	9
Climate.change	Natural.hazards	2	8
Large.scale.tourism	Economy	2	8
Protected.Areas	Habitats	2	8
Respect	Urbanisation...Coastal.development	2	8
Disturbance	Habitats	3	-4
Small.scale.tourism	Biodiversity	3	-6
Local.governance	Sanitation	2	-8
Sanitation	Pollution	2	-8
Cultural.heritage...Traditions	Local.rules.and.regulations	2	-10
Disturbance	Ecological.dynamics	2	-10
Habitats	Erosion	2	-10
Pollution	Local.fisheries	3	-12
Pollution	Habitats	3	-14



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





Most important relationships of elements in Martinique

- sorted as a cascade of logical connections

Sending elements >>> Receiving elements		Frequency	Strength
Agriculture	Pollution	2	10
	Pollution	3	-12
	Pollution	3	-14
	Pollution	2	-8
Local.governance	Sanitation	2	-8
	Sanitation	2	9



To collect your feedback/opinion, we will perform :

- 1) a group discussion,
- 2) a Mentimeter session. You can join via: www.menti.com/ and use the code (will be shown on screen). Or you can scan the QR.



Appendix 6.2. Introduction to the BowTie

MARBEFES

MARine Biodiversity and Ecosystem Functioning leading to Ecosystem Services

Connecting the important factors

The BowTie approach

A simple Ecological-Social-Economic Tool

Michael Elliott, Anita Franco, IECS Ltd, Hull, UK
 Marta Pascual, BC3, Leíoa, Spain
 Adapted by: Herman Hummel, HuFoSS, Roosendaal, NL

Funded by the European Union

UKRI

IECS

HuFoSS

bc3

MARBEFES

Objectives of the Session

1. Basic explanation of the “BowTie”
2. What is valuable in the “BowTie” approach
3. Looking for feedback and input from you as Stakeholder!

UKRI

bc3

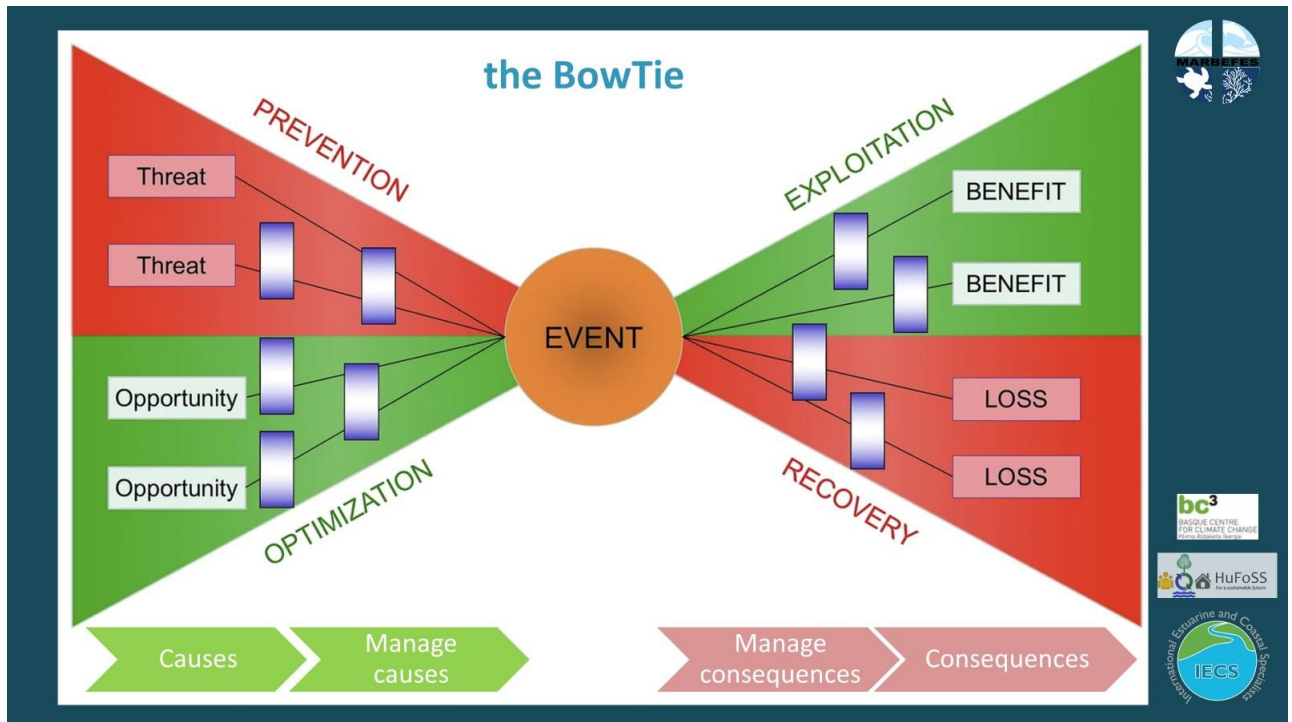
HuFoSS

IECS

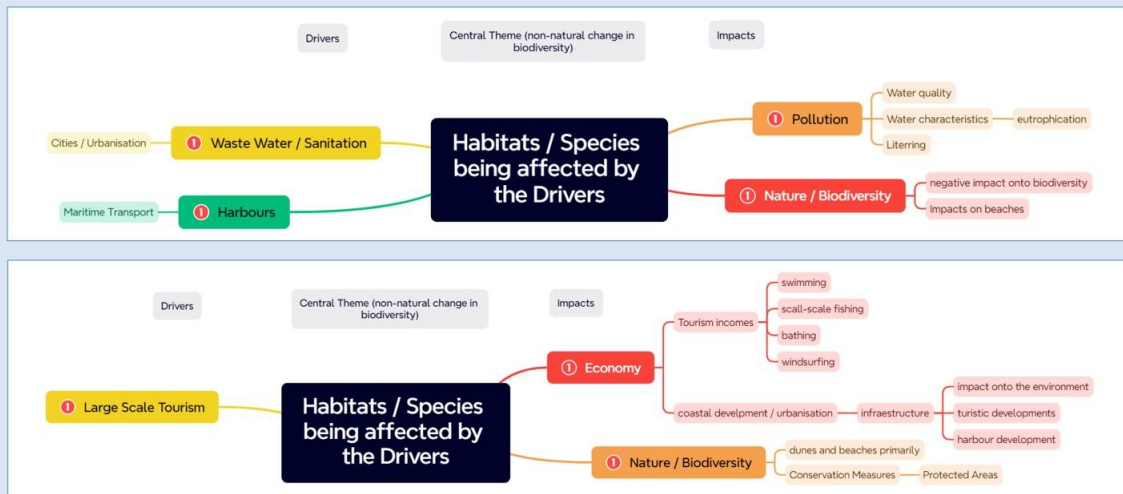


The MARBEFES project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354’





To be adapted at 20 November Bow-tie analyses Martinique
Example: Waste-water/Harbours and Tourism



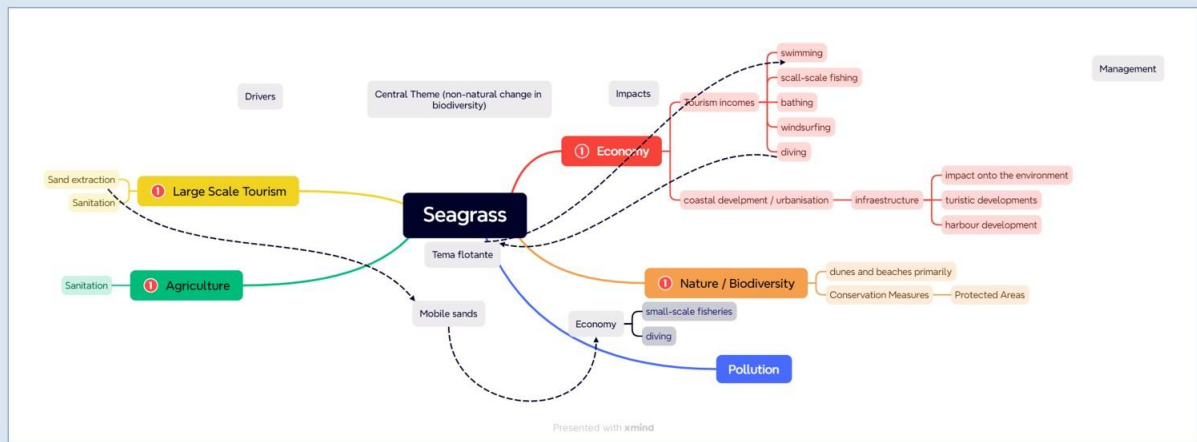
The MARBEFES project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354’



To be adapted at 20 November

Bow-tie analyses Martinique

Nested BowTie for Large-scale Tourism and Agriculture



Benefits of our BowTie approach

- Simplifying a complex system
- Promoting collaboration between scientists and stakeholders based on shared understanding of the system and co-development of a simple tool
- Allow the stakeholder to target elements in the system where management measures will be most effective



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Appendix 6.3. Introduction to the MARBEFES Toolbox

Other tools next to the BowTie

In MARBEFES a range of tools will be collated in a Tool-Box.

The Toolbox

Sabine Cochrane, Amanda Ziegler and Charlotte Weber
 AkvaplanNiva, Tromso, Norway



MARBEFES Project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no 101060937 and UKRI under Grant Agreements 10040216, 10048815 and 10041354



What is a Tool, and the Toolbox?

- A physical thing/ measuring device
- A guidebook/ instruction manual
- Species identification technology
- Data analysis method
- Ecological assessment/valuation
- Citizen science
 - E.g. data collections, observations



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Who are the Stakeholders to use the MARBEFES Toolbox?



Education

Schools, educators, researchers, students



Society

Public groups, interest organisations, spiritual/religion, cultural heritage



Business

Entrepreneurs, industry, commerce, hotels



Governance

Authorities, regulators, managers, policy-makers



Why a Toolbox:

To think and decide together on important coastal environmental issues, a.o. :

- Nature
- Tourism
- Infrastructure & Transport
- Spatial planning



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Appendix 6.4. Introduction to the Scenarios of Change



MARBEFES

MARine Biodiversity and Ecosystem Functioning leading to Ecosystem Services

The future of our Coast: Scenarios of change

Willem Boone, Hanneloor Heynderickx
VLIZ, Ostend, Belgium

Herman Hummel, Bram Sturm, Rob Segeren, Hanie Matajinimvar
HuFoSS, Roosendaal, the Netherlands



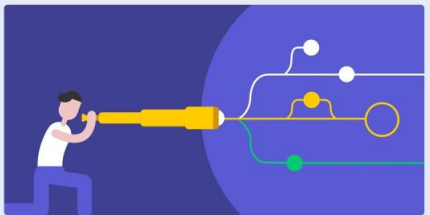

 MARBEFES Project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no 101060937 and UKRI under Grant Agreements 10040216, 10048815 and 10041354









What are scenarios?

Scenarios are:

- descriptions of plausible societal or policy trajectories and changes
 - because of changes in biodiversity, land-use, global markets, climate
- used to guide and improve strategies, policy-making and environmental management
- ways to explore possible futures!



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Theme for MARBEFES: The Coast in a changing world, following 3 Shared Socio-Economic Pathways (SSPs)

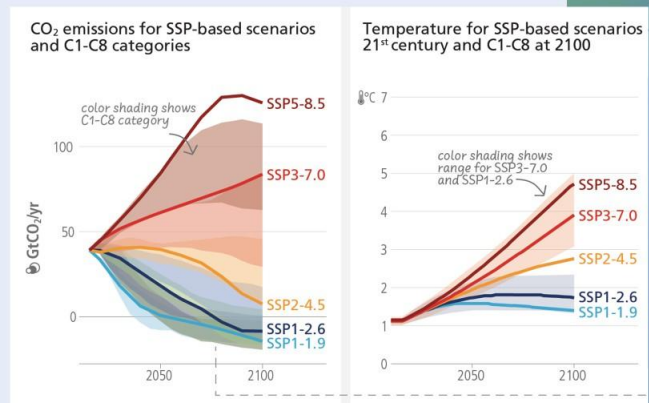


Scenarios for the future

SSP
SHARED SOCIOECONOMIC PATHWAYS

- 1. TAKING THE GREEN ROAD**
In which the "world shifts gradually, but pervasively, towards a more sustainable path..."
- 2. MIDDLE OF THE ROAD**
Where the "world follows a path in which trends do not shift markedly from historical patterns..."
- 3. ROCKY ROAD**
In which countries "focus on domestic or regional issues" with a resurgence of nationalism, competition, and conflict.
- 4. A ROAD DIVIDED**
In which the world experiences "increasing inequalities and stratification both across and within countries"
- 5. TAKING THE HIGHWAY**
In which we "put our faith in competitive markets" and we luck into "rapid technological progress" that advances sustainable development

Figure by Nico Tutoni for PRI's Earth@Home project



<https://www.ipcc.ch/report/ar6/syr/figures/csb-2-figure-1>

Reference to the following pictures

- <https://www.belgianoffshoreplatform.be/nl/news/een-klimaatneutraal-belgie-tegen-2050-met-de-laagste-maatschappelijke-kosten/>
- <https://vlaamsevisveiling.com/>
- <https://www.tijd.be/ondernemen/toerisme/omzet-kusttoerisme-krijgt-knauw/9228149.html>
- <https://www.visitotende.be/nl/de-oosteroever>





SSP1 Sustainability: the Green road



Policy:

- Protecting the environment
- Regulation and renewable energy
- Strong global cooperation

Investment costs: ★★★★★
Economic growth: ★★☆☆☆

Interpretatie van ChatGPT & Dall-E



SSP3 Regional rivalry: the Rocky Road



Policy:

- Self-sufficiency
- Weak regulation
- Minimal international cooperation

Investment costs: ★★☆☆☆
Economic growth: ★★☆☆☆

Interpretatie van ChatGPT & Dall-E



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'





SSP5

Fossil-fuelled development: taking the Highway



Policy:

- Industrialization & Economic Growth
- Delayed Climate Action
- Global Markets

Investment costs: ★★★★★☆

Economic growth: ★★★★★★

Interpretatie van ChatGPT & Dall-E



Summary on the conditions for the 3 SSPs

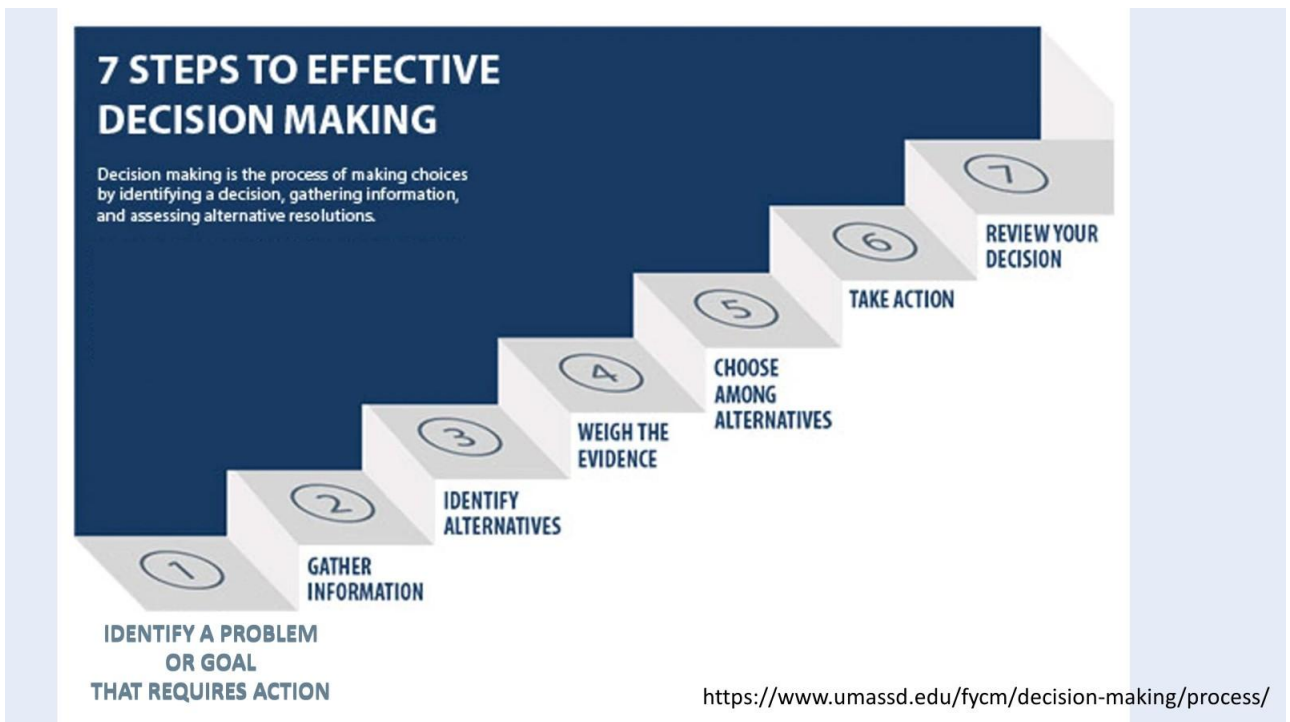
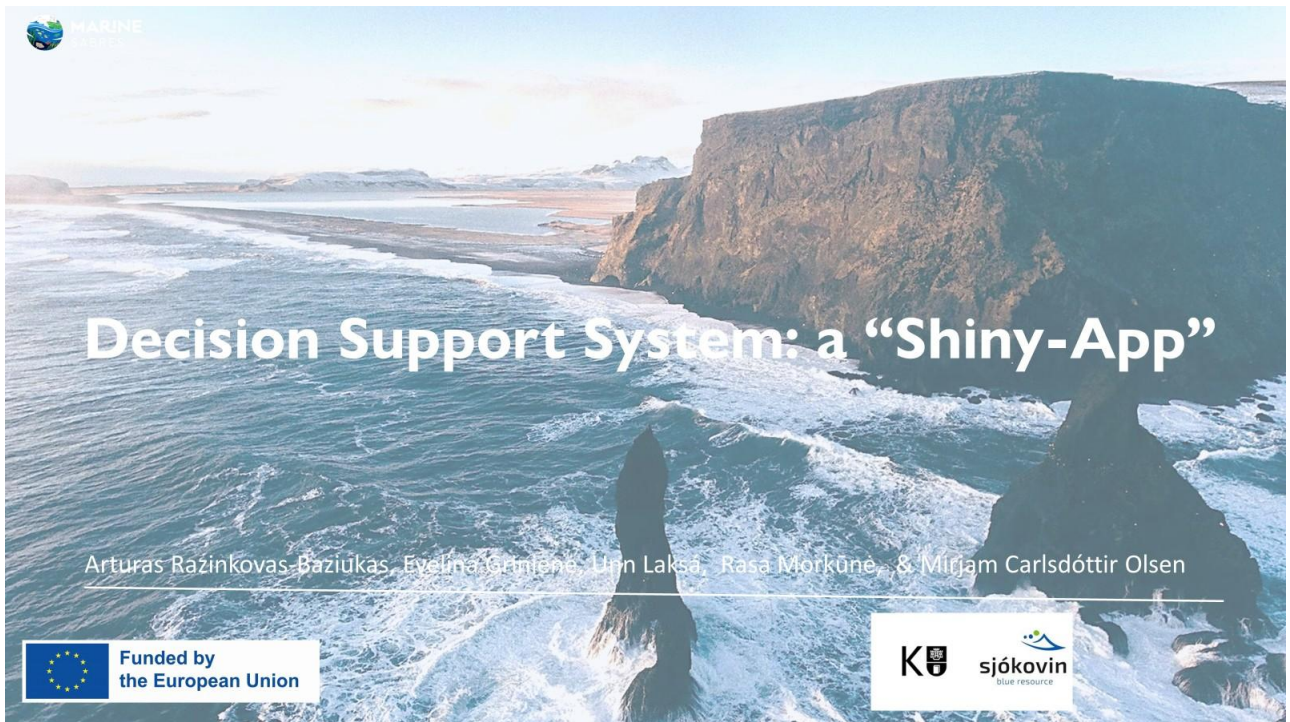
SSP1 Sustainability	SSP3 Regional Rivalry	SSP5 Fossil-fuelled
Protecting the environment	Self-sufficiency	Industrialization & Economic Growth
Regulation and renewable energy	Weak regulation	Delayed Climate Action
Strong global cooperation	Minimal international cooperation	Global Markets
Investment costs: ★★★★★★	Investment costs: ★★☆☆☆	Investment costs: ★★★★★☆
Economic growth: ★★★★★☆	Economic growth: ★★☆☆☆	Economic growth: ★★★★★★



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'

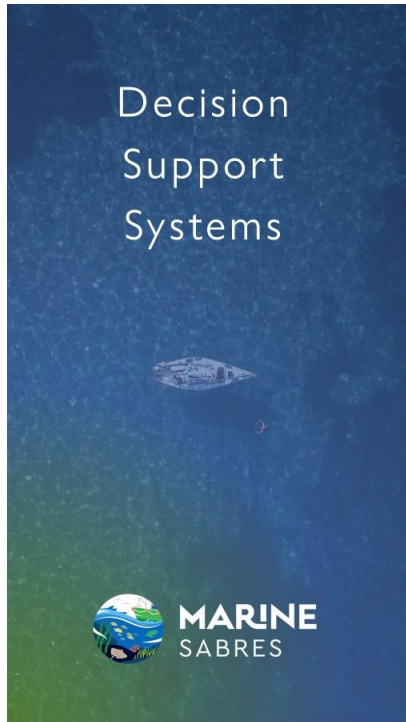


Appendix 6.5. The Decision Support System (DSS)

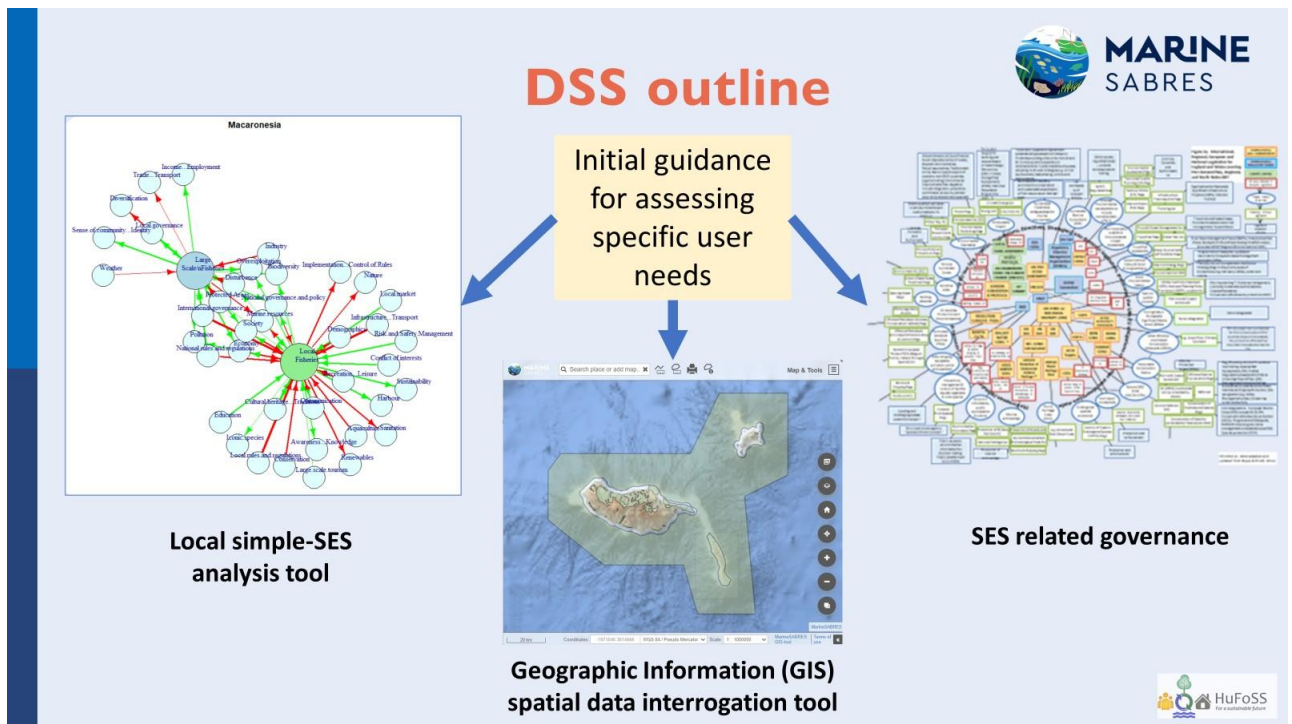


The MARBEFES project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354’





- The overarching aim of a decision-support system is to **support and enable informed decision-making**
- In marine management, some connected challenges include: navigating trade-offs, risks, uncertainties, and differing interests among the public.
- A DSS can support decision-makers in balancing or understanding said challenges



The MARBEFES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement no 101060937, and UKRI under Grant Agreements 10040216, 10048815, 10041354'



Live show of local simple-SES tool and the Toolbox



- **MARBEFES Toolbox design:**
<https://xd.adobe.com/view/a30029fd-3569-4d5c-9979-28b50218acb6-f653/?fullscreen>
- **MARBEFES / MarineSABRES SES tool :**
<http://laguna.ku.lt:3838/marinesabres/>



STAKEHOLDER CONSULTATIONS

General group discussion and Mentimeter



We will be doing some surveys to collect your feedback/opinions.
You can join via: www.menti.com/ and use the code (will be shown on screen).
Or you can scan the QR.



Appendix 7. Results from Menti-Meter sessions

Appendix 7.1.a. Priorities as Indicated by Stakeholders – Original

Question type	Location of SH	SH	Q1. Quel secteur professionnel représentez-vous ?
Multiple choice	Martinique	1	Milieu universitaire et la recherche
	Martinique	2	ONG / Associations
	Martinique	3	Transports Maritimes
	Martinique	4	Autre
	Martinique	5	Authorities (gouvernance / politique)
	Martinique	6	Secteur privé / Petite et moyenne entreprises
	Martinique	7	Authorities (gouvernance / politique)
Question type	Location of SH	SH	Q2. Vos points de vue sont-ils reflétés dans les résultats de la première consultation des parties prenantes ?
Multiple choice	Martinique	1	Oui, beaucoup
	Martinique	2	Oui, beaucoup
	Martinique	3	Un peu
	Martinique	4	Oui, beaucoup
	Martinique	5	Oui, beaucoup
	Martinique	6	Oui, pour la plupart
	Martinique	7	Oui, beaucoup
Question type	Location of SH	SH	Q3. Y a-t-il des résultats d'entretiens qui vous ont surpris ?
Open ended	Martinique	1	Not really
	Martinique	2	No surprises
	Martinique	3	No
	Martinique	4	No surprises
	Martinique	5	No
	Martinique	6	No
	Martinique	7	no
Question type	Location of SH	SH	Q4. Y a-t-il d'autres éléments importants à ajouter ?
Open ended	Martinique	1	
	Martinique	2	No
	Martinique	3	Difference between local and national politics
	Martinique	3	Increase awareness of the public
	Martinique	3	I would have appreciate a more guided interview
	Martinique	4	Personnel sufficient
	Martinique	5	No
	Martinique	6	No
	Martinique	6	No
Martinique	7	no	
Question type	Location of SH	SH	Q5. Avez-vous des commentaires ou questions ?
Open ended	Martinique	1	
	Martinique	2	Présentation de ces résultats nécessaire aux élus / financeurs / gestionnaires comme l'ensemble des résultats de l'étude
	Martinique	3	
	Martinique	4	Les résultats sont très riches et diversifiés
	Martinique	5	Faire ce travail de connexion était intéressant Cela montre l'interconnexion forte de chaque éléments, structures
	Martinique	6	
	Martinique	7	



Appendix 7.1.b. Priorities as Indicated by Stakeholders – English translation

SH Q1. What professional sector are you representing?	
1	Academia/ Research
2	NGO/ Non-profit
3	Maritime Transport Sector
4	Other
5	Authorities (governance/policy)
6	Private sector / SME
7	Authorities (governance/policy)
SH Q2. Do you see your viewpoints reflected in the results of the first stakeholder involvement?	
1	Yes, a lot
2	Yes, a lot
3	A bit
4	Yes, a lot
5	Yes, a lot
6	Yes, mostly
7	Yes, a lot
SH Q3. Were there any results from the stakeholder interviews you found surprising?	
1	Not really
2	No surprises
3	No
4	No surprises
5	No
6	No
7	no
SH Q4. Are there any other important elements to add?	
1	
2	No
3	Difference between local and national politics
3	Increase awareness of the public
3	I would have appreciate a more guided interview
4	Sufficient personnel
5	No
6	No
6	No
7	no
SH Q5. Any other questions or comments?	
1	
2	Presentation of these results is necessary for elected officials / funders / managers, as is the case for all the results of the study.
3	
4	The results are very rich and diverse.
5	Doing this work of making connections was interesting. It shows the strong interconnectedness of each element, each structure.
6	
7	



Appendix 7.2.a. The Decision Support System (DSS) – Original

Location of SH	SH	Q1. Quel secteur professionnel représentez-vous ?
Martinique	1	Milieu universitaire et la recherche
Martinique	2	Milieu universitaire et la recherche
Martinique	3	ONG / Associations
Martinique	4	Transports Maritimes
Martinique	5	Authorities (gouvernance / politique)
Martinique	6	Secteur privé / Petite et moyenne entreprises
Martinique	7	Authorities (gouvernance / politique)
Location of SH	SH	Q2. Comment évaluez-vous cet outil ? (de 1 à 5)
Martinique	1	4
Martinique	2	5
Martinique	3	4
Martinique	4	4
Martinique	5	4
Martinique	6	4
Martinique	7	4
Location of SH	SH	Q3. Qui, selon vous, utiliserait cet outil ?
Martinique	1	Moi, j' utiliserais cet outil
Martinique	2	D'autres personnes pourraient utiliser cet outil
Martinique	3	D'autres personnes pourraient utiliser cet outil
Martinique	4	D'autres personnes pourraient utiliser cet outil
Martinique	5	Moi, j' utiliserais cet outil
Martinique	6	D'autres personnes pourraient utiliser cet outil
Martinique	7	Moi, j' utiliserais cet outil
Location of SH	SH	Q4. Pourquoi utiliseriez-vous cet outil ?
Martinique	1	Gestion Ap
Martinique	1	Gestion Amp*
Martinique	1	Complexity of interface
Martinique	2	
Martinique	3	Pour expliciter le choix de certaines mesures de gestion
Martinique	4	Représenter des interactions with complexes
Martinique	4	Communiquer sur la pertinence des actions
Martinique	5	Pour voir l'ensemble des leviers d'actions
Martinique	6	
Martinique	7	prioriser les actions et avoir des pistes pour mettre en place des solutions
Location of SH	SH	Q5. Pourquoi n'utiliserez-vous pas cet outil ?
Martinique	1	
Martinique	2	
Martinique	3	Maîtrise de l'outil informatique
Martinique	4	Pas très user friendly
Martinique	5	
Martinique	6	Not concerned.Very long Time to Well understand this tool learn to use it. It could be interesting to clarify or simplify its using
Martinique	7	la prise en main
Location of SH	SH	Q6. Qu'est-ce qui vous manque dans cet outil ?
Martinique	1	
Martinique	2	
Martinique	3	
Martinique	4	
Martinique	5	
Martinique	6	A manual user
Martinique	7	le côté explicatif de ce que traduisent les schémas
Location of SH	SH	Q7. Pourriez-vous préciser les termes ou expressions utilisés dans cet outil qui vous ont semblé difficiles à comprendre ?
Martinique	1	Need more time to explore the tool
Martinique	2	
Martinique	3	Physiogeographie
Martinique	3	Macrobien
Martinique	3	Risque et dangers pas exhaustif ou trop généralistes
Martinique	4	Plus de pratique pour juger
Martinique	5	
Martinique	6	Macrobien
Martinique	7	besoin de plus de temps pour comprendre l'outils
Location of SH	SH	Q8. À quelles questions cet outil vous permettrait-il de répondre dans votre travail quotidien ?
Martinique	1	So many !
Martinique	1	Need more time to explore possibilities
Martinique	2	
Martinique	3	Find better solutions for managment
Martinique	4	Not daily.
Martinique	4	Comment prioriser mes actions
Martinique	4	Montrer l'interaction entre les différents projets
Martinique	5	Quels acteurs travaillent sur ce sujet ?Qui a un rôle sur ce sujet ?
Martinique	6	Not concerned...
Martinique	7	comment mobiliser les élus
Location of SH	SH	Q9. Avez-vous des commentaires ou questions ?
Martinique	1	
Martinique	2	
Martinique	3	
Martinique	4	Référent en Martinique qui construit un ou plusieurs modèles
Martinique	5	
Martinique	6	Manual guide
Martinique	7	



Appendix 7.2.b. The Decision Support System (DSS) – English translation

SH Q1. What professional sector are you representing?	
1	Academia/ Research
2	Academia/ Research
3	NGO/ Non-profit
4	Maritime Transport Sector
5	Authorities (governance/policy)
6	Private sector / SME
7	Authorities (governance/policy)
SH Q2. How would you rate this tool? (1-5)	
1	4
2	5
3	4
4	4
5	4
6	4
7	4
SH Q3. Who do you think will use this tool?	
1	I will use this tool
2	Others will use this tool
3	Others will use this tool
4	Others will use this tool
5	I will use this tool
6	Others will use this tool
7	I will use this tool
SH Q4. Why would you use this tool?	
1	Management Ap
1	Asset Management *
1	Complexity of interface
2	
3	To explain the choice of certain management measures
4	To represent interactions with complex systems
4	To communicate the relevance of actions
5	To see all the levers for action
6	
7	To prioritize actions and have ideas for implementing solutions
SH Q5. Why would you NOT use this tool?	
1	
2	
3	Mastery of the information tool
4	Not very user friendly
5	
6	Not concerned. Very long time to well understand this tool learn to use it. It could be interesting to clarify or simplify its using
7	The handling of the tool
SH Q6. What elements are missing in the tool?	
1	
2	
3	
4	
5	
6	A user manual
7	The explanatory aspect of what the diagrams represent
SH Q7. Could you specify any terminology or phrasing used within the tools that you found unclear or difficult to understand?	
1	Need more time to explore the tool
2	
3	Physiogeographhy
3	Macrobia
3	Risks and hazards section not exhaustive or too general
4	More practice needed to make a judgement
5	
6	Macrobia
7	Need more time to understand the tools
SH Q8. What questions would you use this tool to answer in your daily work?	
1	So many !
1	Need more time to explore possibilities
2	
3	Find better solutions for management
4	Not daily.
4	How to prioritise my actions
4	Show the interaction between different projects
5	Which actors are working on this topic? Who had a role is this issue?
6	Not concerned
7	How to mobilise elected officials
SH Q9. Any other questions or comments?	
1	
2	
3	
4	Reference in Martinique who builds one or more models
5	
6	Manual guide
7	

