INNOVATIVE BLOCKCHAIN TRACEABILITY TECHNOLOGY AND STAKEHOLDERS' ENGAGEMENT STRATEGY FOR BOOSTING SUSTAINABLE SEAFOOD VISIBILITY, SOCIAL ACCEPTANCE AND CONSUMPTION IN EUROPE

DELIVERABLE D2.3 – SEA2SEE strategy on consumer-related stakeholders' engagement and sustainable seafood consumer acceptance increase

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Nature of the deliverable

R	Document, report (excluding the periodic and final reports)	☒
DEM	Demonstrator, pilot, prototype, plan designs	☐
DEC	Websites, patents filing, press & media actions, videos, etc.	☐
DATA	Data sets, microdata, etc.	☐
DMP	Data management plan	☐
Ethics	Deliverables related to ethics issues.	☐
SECURITY	Deliverables related to security issues	☐
Other	Software, technical diagram, algorithms, models, etc.	☐

Dissemination level

PU	**Public — fully open (automatically posted online on the Project Results platforms)**	☒
SEN	Sensitive — limited under the conditions of the Grant Agreement	☐

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Current seafood traceability tools and services have the potential to take advantage of novel blockchain technologies to obtain a wide range of data making sustainable seafood practices more visible to consumers. Sea2See project will fill in existing seafood traceability gaps through development and demonstration of an innovative end-to-end blockchain traceability model throughout the seafood value chain and professional and consumer applications to increase trust and social acceptance of sustainably fished and farmed seafood.

The project will provide technological solutions to answer the need of a valuable source of data collected throughout the whole seafood value chain, verified, and covering inputs from diverse stakeholders. For that purpose, a specific focus will be put on active commitment of stakeholders and real empowerment of consumers through the implementation of societal and sectoral strategies for co-creation, communication and awareness raising.

The project runs from July 2022 to June 2026. It involves 14 partners from 6 EU countries, and is coordinated by SMARTWATER PLANET SL, Spain.

More information about the project can be found at: http://www.sea2see.eu/

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EXECUTIVE SUMMARY

This document provides guidelines for the engagement activities within Working Package 2 - Consumer Engagement, co-creation and behaviour change.

It outlines a comprehensive strategy to promote seafood literacy and encourage responsible consumption among European seafood consumers. This strategy aims to raise awareness about the importance of sustainable seafood choices and empower consumers to make informed decisions that contribute to preserving marine ecosystems and the long-term viability of the seafood industry. By aligning the efforts of key stakeholders and leveraging various communication channels, this strategy seeks to drive positive change in seafood consumption patterns and foster a collective commitment to sustainability.

The document provides an overview of the relationship of the WP2 with other WPs of the SEA2SEE Project to report boundaries of actions and identify potential joint efforts to achieve the project's objectives.

The document features a literature review about relevant aspects of consumer engagement and responsible seafood consumption, such as consumers' needs and purchasing trends, Seafood Literacy, seafood sustainability and Ecolabels, consumers' trust, and engagement strategies to collect insights, win-win strategies and lessons learned.

The document includes a key section outlining how consumers used the Collective Intelligence (CI) methodology to identify obstacles to sustainable seafood consumption and product acceptance. This section covers the process, results, and conclusions of the consumer deliberation occurring in France, Greece, Portugal, Spain and which collects the primary solutions co-created by stakeholders to tackle the main challenges to sustainable seafood consumption.

This strategy outlines a specific guideline for identifying the essential stakeholders for the SEA2SEE project's objectives and the criteria for their prioritisation to pave the way for the engagement actions presented in the last part of the document.

Building on the literature review and the results of the CI process, a SWOT and a CAME analysis were performed to analyse the context of stakeholder engagement. These analyses support the SEA2SEE partners in preventing risks to the engagement actions targeting consumers and other relevant stakeholders of the final part of the seafood value chain while scaling up efforts to reach a broader impact.

The final part of the document presents the actions that are envisaged throughout the project duration to raise awareness of sustainable seafood and the educational and engagement tools that will be implemented in the pilot sites. Additionally, it presents communication strategies to promote positive messaging and empower stakeholders to be part of the solution in co-creation processes.

This document provides a comprehensive overview of win-win strategies to empower European consumers to make responsible seafood choices and increase their awareness of sustainably caught and farmed seafood while promoting trust in technological tools for product traceability. By promoting sustainable seafood choices, we can work together to conserve marine ecosystems

and ensure the seafood industry's long-term viability, contributing to a healthier and more prosperous future for our planet.

ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
CI	Collective Intelligence
WTP	Willingness to Pay
EC	European Commission
WP	Work Package
HACCP	Hazard Analysis Critical Control Point

PROJECT PARTNERS

#	Partners full name	Short	Country	Website
1	SMARTWATER PLANET SL	SmartWater	ES	www.smartwaterplanet.com
2	TILKAL	Tilkal	FR	www.tilkal.com
3	PAGE UP	PAGE UP	FR	www.pageup.fr
4	SUBMON	SUBMON	ES	www.submon.org
5	CENTRO DE CIÊNCIAS DO MAR DO ALGARVE	CCMAR	PT	www.ccmar.ualg.pt
6	ASOCIACION NACIONAL DE FABRICANTES DE CONSERVAS DE PESCADOS Y MARISCOS-CENTRO TECNICO NACIONAL DE CONSERVACION DE PRODUCTOS DE LA PESCA	ANFACO	ES	www.anfaco.es
7	IOANNA N.ARGYROU SIMBOULOI EPICHEIR ISIAKIS ANAPTYXIS ETAIREIA PERIORISMENIS EYTHYNIS	NAYS	EL	www.nays.gr
8	SEAENTIA-FOOD, LDA	SEAentia	PT	www.seaentia.com
9	LANDLNG AQUACULTURE BV	LA	NL	www.landingaquaculture.com
10	UNIVERSIDADE DE AVEIRO	UAVR	PT	www.ua.pt
11	VITAGORA POLE	VITAGORA	FR	www.vitagora.com
12	ETHIC OCEAN	Ethic Ocean	FR	www.ethic-ocean.org
13	EVROPROJECT OOD	EP	BG	www.europroject.bg
14	ASSOCIAÇÃO NATUREZA PORTUGAL	ANP	PT	www.natureza-portugal.org

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1. INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

This document will serve as a roadmap for identifying stakeholder groups of interest for the SEA2SEE project, aiming to implement consistent and targeted actions for their active participation and involvement.

As a continuation of Deliverable D1.1, this document will provide a framework for the engagement of stakeholders identified in the last part of the seafood value chain, to approach them and collect their opinions, perspectives and needs, so the consortium can use it as a baseline for developing strategies and actions toward a paradigm shift in the way consumers purchase and consume seafood in Europe.

With this document, we will provide answers to the following questions:

- What are the purpose and objectives of the consumer engagement strategy within the SEA2SEE project?
- How the stakeholders, especially consumers, could be approached and engaged?
- What are the means for monitoring and evaluating the consumer engagement process?

In the document, a detailed description of the deliberations of consumers on barriers to sustainable seafood consumption in Europe will be provided, together with an explanation of the Collective Intelligence process undertaken to collect barriers and define solutions.

In this process, the present document presents the challenges and opportunities of stakeholder engagement and win-win strategies, together with examples of actions to be implemented.

1.2 BACKGROUND – THE ROLE OF CONSUMERS

When buying or consuming seafood, consumers have the right to know facts about the products: what species, their origin, the sustainability of the population and stocks, fishing gear used, aquaculture parameters such as water quality indicators and feeding processes, impacts on the environment, and information about processing and transformation, among others. Consumers also have the responsibility to make informed decisions when it comes to purchasing or consuming seafood products. When it comes to the seafood industry, research has suggested that consumers have the potential to make a paradigm shift towards sustainable purchasing and consumption practices when resources and tools are available to them (Richter and Klöckner, 2017[1]; Haider et al., 2022[2]).
Analysing and understanding consumers' expectations, needs, and purchasing trends is crucial to the feasibility of the entire seafood supply chain. In this regard, it is of utmost importance to

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5664025/
[2] https://www.mdpi.com/2071-1050/14/7/3999

listen to their needs, investigate information gaps, and plan strategic actions to overcome barriers to sustainable seafood consumption and product acceptance.
In the framework of the SEA2SEE project, the Consumer's Engagement Strategy looks to understand these needs and work through different steps to achieve a change in seafood consumption behaviour (**¡Error! No se encuentra el origen de la referencia.**).

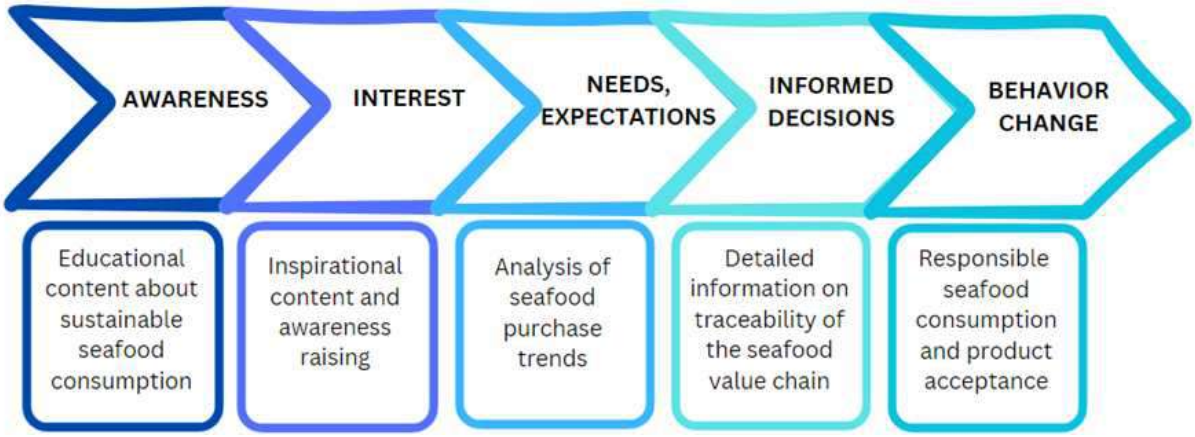

Figure 1. From awareness to behaviour change

Analysing and understanding consumers' expectations, needs, and purchasing trends is crucial to the feasibility of the entire seafood supply chain. In this regard, listening to their needs, investigating information gaps, and planning strategic actions to overcome barriers to sustainable seafood consumption and product acceptance is of utmost importance. Consumers have increasingly asked for transparency in the last decades, claiming information on seafood traceability and sustainability before purchasing or consuming seafood.

In this sense, in the SEA2SEE project, all activities have a participatory scheme to understand consumers' needs and claims better.

Participation is about collaboration, empowerment, and direct active engagement through all stages of the SEA2SEA work. Participation is about speaking and listening to people on their terms. Participation goes beyond asking people for their opinions or what might be called 'participation by consultation'. It gives your target group a voice about the barriers to change, ownership, and responsibility for solutions to influence their welfare. Research is interactive; it's 'with' and not 'on' your target group. As shown in Figure 2 below, we are moving towards collaborating and empowering our target group.

Figure 2. Levels of participation

One of the SEA2SEE overarching objectives is to seek a behaviour change in how European citizens purchase and consume wild captured or farmed seafood by closing the value-action gaps to increase the public's knowledge and understanding of seafood. A value-action gap is a mismatch between a person's values and what they do. To overcome this gap, individuals, communities, and policymakers need to actively participate in identifying barriers to change and exploring potential solutions. This participation empowers individuals by aligning their values and increasing their sense of control over the situation. It also facilitates dialogue and mutual learning to manage and resolve highly complex issues influencing human behaviour, seafood consumption choices, and our relationship with the ocean.

Steps to influence behaviour should start with understanding the target group you want to change. The activity is to comprehend the reasons behind their actions, values and motivations and use this understanding to develop an equally appealing offering with positive personal and social outcomes.

Successful behaviour change is built through a well-grounded understanding of current behaviour and the people engaged in it.

Within SEA2SEE, the co-creation of solutions is a powerful approach to engaging and motivating individuals to adopt new behaviours.

1.3 BASELINE CONTEXT AND GDPR COMPLIANCE FOR ENGAGEMENT ACTIVITIES

We must plan and deliver a proper engagement strategy to achieve the intended impacts. As a consortium, we should cultivate relationships with those interested in and can benefit from the results of the SEA2SEE project. Listening and learning are essential to understanding these

individuals and what motivates them. The variety of profiles, expectations and needs make this task more challenging for consumers.

Public and stakeholder engagement rules are being rapidly rewritten in this digital, post-pandemic era. As mentioned in Deliverable D1.1 section 2.2, SEA2SEE stakeholder's engagement strategy considers agreed international standards (AA1000SES; ISO 26000:2010, Guidance on social responsibility, Global Reporting Initiative, UN Global Compact).

Regardless of the methodology and tools used in the SEA2SEE consumer engagement strategy (Chapter 6), the activities of engagement are by the SEA2SEE Data Management Plan (Task 8.5), which sets out guidelines to implement FAIR data management principles, data security and ethical aspects of data collection and usage.

As stated in section 3.3 of Deliverable D1.1, in accordance with the Grant Agreement, all data and records from the SEA2SEE engagement activities will be kept for five years after the final payment.

2. INTERNAL COLLABORATION FOR A SUCCESSFUL ENGAGEMENT STRATEGY

Effective communication among partners involved in WP2 has played a vital role in creating this document, ensuring the successful implementation of WP2 activities, and addressing concerns related to stakeholder (consumer) engagement.

During the development of this Strategy, other interactions have emerged, including establishing a sustainability framework for the SEA2SEE Project, linkages with the Sister Project by inviting them into our participatory workshops, and close interaction with the pilot sites. These interactions enhance the overall effectiveness and impact of the project by leveraging synergies, sharing knowledge and resources, and ensuring a coordinated approach across related initiatives. (Figure 3).

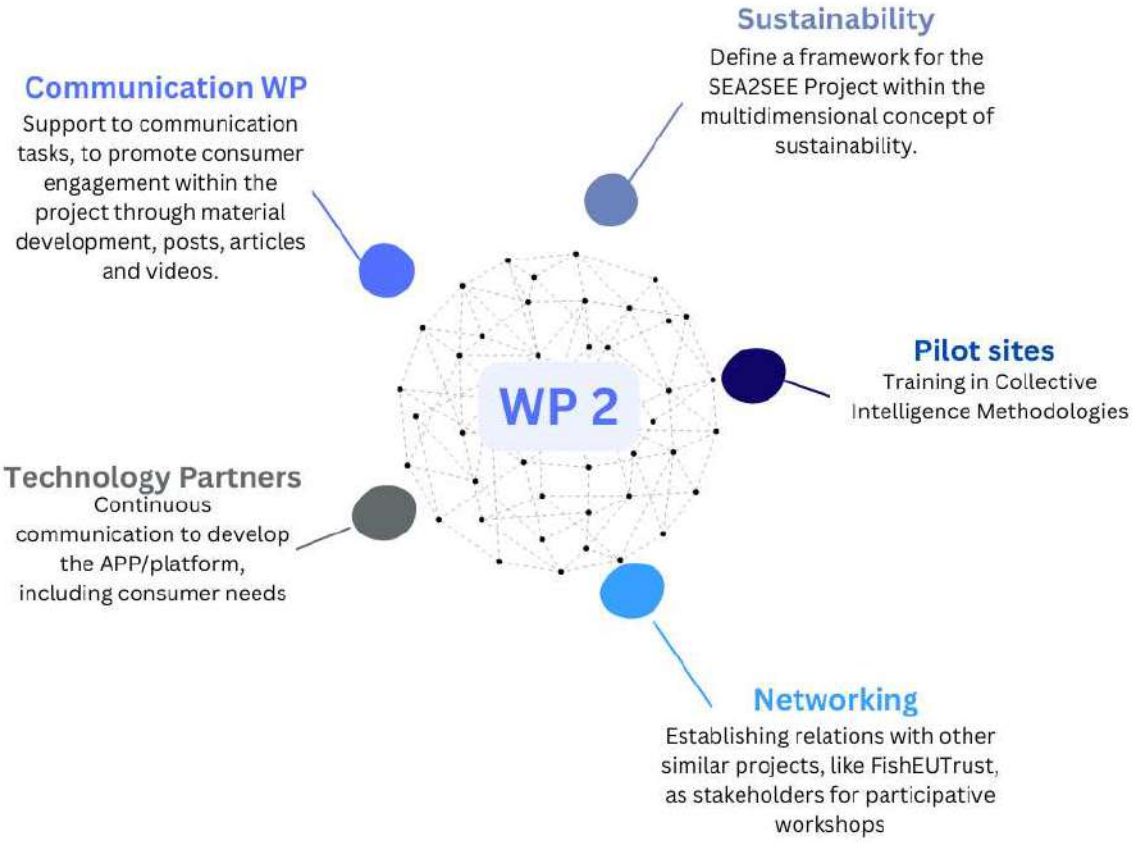

Figure 3. Map of interactions among different Work Packages and initiatives of the SEA2SEE project.

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2.1 RELATIONSHIP BETWEEN WP1 AND WP2

WP2 (Work Package 2) plays a crucial role in the SEA2SEE project by focusing on stakeholder engagement with seafood end-consumers and retailers. This section outlines the complementary strategies of WP2 about WP1 and highlights their collaborative efforts towards achieving the project objectives.

The main objective of WP1 is to address stakeholders at the beginning and along the seafood value chain, focusing on traceability practices using blockchain technology. In contrast, WP2 aims to engage seafood end-consumers, HoReCa and retailers to promote responsible consumption decisions.

To ensure a successful stakeholder strategy, WP1 and WP2 partners will develop a novel methodology targeting all the stakeholder groups along the seafood value chain (Figure 4). WP1 primarily targets seafood production, processing, packaging, distribution, and retail stakeholders. On the other hand, WP2 focuses on engaging seafood end-consumers and retailers, including supermarkets, restaurants, and the general public.

Figure 4. Distribution of targeted stakeholders by WP1 (light blue) and WP2 (blue).

WP2 and WP1 partners will work in close cooperation to avoid duplication and overlap of actions and will join forces to achieve SEA2SEE objectives successfully.

Both strategies are driven by the co-creation approach, meaning stakeholders will be contacted and engaged in developing tools and solutions that fully meet their needs.

The WP1 engagement strategy will explore stakeholders' needs and barriers to engagement in traceability practices. In contrast, the WP2 Consumer's Engagement Strategy will also identify the barriers to seafood consumption and develop activities to promote responsible and well-informed decisions when they choose the seafood they buy or eat (Figure 5).

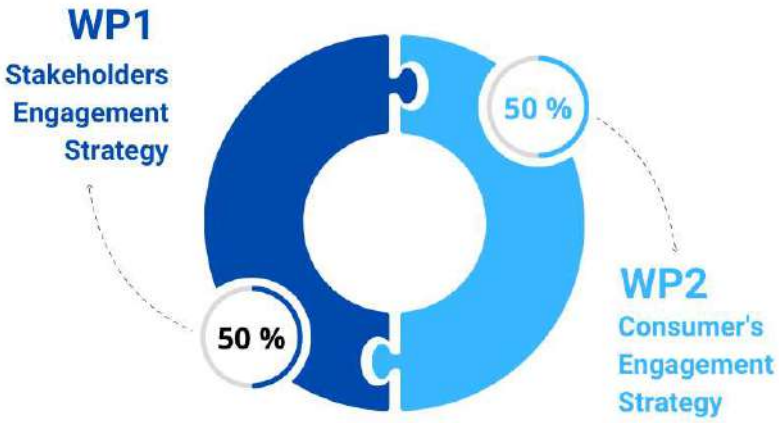


Figure 5. Complementarity of Stakeholder Engagement Strategies developed by WP1 and WP2.

2.2 RELATIONSHIP BETWEEN WP2 AND OTHER WPS

Several meetings have taken place since the project's inception to establish clear boundaries between the actions of WP1 and WP2, ensuring no overlap or conflicts. The decision to focus on end-consumers as the target stakeholders for WP2 actions was collectively agreed upon by all partners and validated by the SEA2SEE project coordinators.

Partners have effectively collaborated on various activities under WP2. Notably, they worked together to develop a survey, which was subsequently translated into native languages and disseminated to reach a broader audience in the project countries, aiming to achieve the desired sample size (refer to section 5.1.1).

A significant milestone for internal engagement within the project was the scheduling of Collective Intelligence training sessions provided by SUBMON (see section 5.1.2). These sessions played a crucial role in facilitating successful collaboration while identifying and categorising barriers to responsible consumption and product acceptance Partners agreed on the schedule for SUBMON's visits and hosted the training sessions at their respective premises.

Throughout this process, partners collaborated to identify categories and sub-groups of stakeholders in the latter stages of the value chain, as previously defined in deliverable D1.1. Discussions led to identifying criteria for selecting relevant stakeholders for the SEA2SEE project (see section 4.2).

Furthermore, partners discussed and reached an agreement on analysing groups of stakeholders and their identification within a matrix of power vs interest, building on an exercise done in Spain. Special attention was given to the different pilot sites' diverse geographic, social, economic, and cultural contexts (see section 4.3).

Integrating Sustainability within the SEA2SEE project

The agreement on seafood sustainability within the SEA2SEE project draws on elements from two widely recognised definitions from the Brundtland Commission and the United Nations. The first mentions the necessity of meeting current needs without compromising the predicted needs of future generations (i.e., guaranteeing fish stocks). In contrast, the second defines sustainability based on three social, environmental, and economic pillars.

The Consortium agreed on identifying existing sustainability criteria for seafood and finding solutions to integrate some of them into the SEA2SEE technological products, while others could be delivered to the target public by communication, awareness and engagement activities.

Collaboration and cooperation among partners are still ongoing while debating the need to agree on a standard definition/baseline about the concept of seafood sustainability, acknowledging its complexity and multi-layered nature for the SEA2SEE project to have a transparent approach to the areas we could manage to include in our practice.

At this moment, we look forward to defining a clear baseline and dimensions to include in the SEA2SEE project. A working group has been established to discuss sustainability, and Ethic Ocean is leading the proposal of solutions.

Cases of Use - Interaction with the Technology partners of the Consortium

Furthermore, WP2 works collaboratively with the project's technology-responsible partners to develop consumer tools and define the use cases for the blockchain platform. This collaborative effort ensures that WP2 aligns its activities with the technological advancements made by the project's tech partners. The aim is to create innovative tools that enhance consumer experiences and facilitate the effective use of the blockchain platform.

Partners of WP2 have contributed to the definition of cases of use of the SEA2SEE platform from the consumer's perspective (see section 6.7), identifying insightful considerations for using the SEA2SEE traceability tools at the time of purchasing. This conversation supported the technical partners of SEA2SEE in the identification of the needs and expectations of consumers toward the use of the traceability platform.

Relationship between WP2 and WP5

The WP2 partners worked well together and were able to discuss and exchange ideas on how to implement the engagement actions presented in section 6.6 effectively. Furthermore, WP2 actions will be complementary to the activities proposed by WP5 in the demonstration sites. Conversation on adapting the activities to different geographical and cultural contexts is still ongoing, leading to fruitful debates and new ideas for implementing measures in the future years of the SEA2SEE project.

Relationship between WP2 and WP7

WP2 and WP7-Communication work closely together to coordinate strategic posts on SEA2SEE's social media channels and website and develop consumer engagement campaigns. A great example of this collaboration is the creation of communication materials to advertise activities under WP2 (see section 7.1) and to encourage public participation. One of the initial campaigns was to encourage stakeholders at the end of the seafood value chain to complete a survey that identifies barriers to seafood consumption and acceptance of seafood products.

These resources are written in plain language, making them less technical and more readily understandable, so they are manageable to share within different spaces like exhibitions, presentations, interviews, campaigns, etc.

In addition, a dedicated page has been established on the SEA2SEE website to provide users with information about opportunities for involvement and engagement. This section serves as a platform to promote all the actions and activities undertaken by WP2 to foster broader participation among stakeholders.

3. LITERATURE REVIEW ON SEAFOOD CONSUMPTION

3.1 METHODS

Snowball method for literature review

When doing a literature review, snowballing refers to using the reference list of a paper or the citations to the article to identify additional documents. Starting with a few pieces that currently exist in or around the topic of interest, referred to as 'start set';

Backward Snowballing:

The methodology involves using the reference list to identify new papers for inclusion, following these steps:

- Scan the reference list and exclude papers not covering the criteria selected, such as language, publication year and type of publication (if only considering peer-reviewed papers).
- Remove papers from the list already reviewed.
- The remaining papers are candidates for abstract/full-text review inclusion.
- If the paper is interesting for inclusion, then it is time to find potentially new papers to include using the reference list of the current paper.
- The process can continue to find more relevant articles.

Forward Snowballing:

Refers to identifying new papers by examining those that cite the paper under consideration. A facility known as 'citation tracking' available in large online databases such as Google Scholar helps in this process:

- Each candidate citing the paper is examined. The first screening is done based on the information from Google Scholar or other search engines (WebofScience etc.)
- If this information is insufficient for a decision, the citing paper is studied more thoroughly.

3.2 DATABASE OF RELEVANT RESEARCH ON THE KEY TOPICS

After examining the references, we selected the most relevant ones to understand the topic better and identify other valuable sources for the literature review. This repeated process creates a "snowball" effect as we uncover more sources.

Following the snowball method, we keep an eye out for keywords, concepts that appear frequently in the references. When conducting a literature review, we choose specific keywords and evaluate the quality and relevance of new sources to our research question. Not all sources we found were suitable for inclusion in this literature review.

After identifying the breakpoint, we categorize sources by themes, concepts, and critical topics. We focus on the literature review question and scope, prioritizing sources directly contributing to our objectives. A complete list of relevant papers can be found in the Annex 9.1.

3.3 KEY TOPICS FOR THE LITERATURE REVIEW

To narrow our literature review on seafood consumption and consumers, the following topics were identified and defined:

Consumers' needs and purchasing trends: includes consumers' preferences and purchasing criteria when buying seafood products, taking into account their profile, including willingness to pay, lifestyle, consumption habits, age, attention to labelling, and awareness.

Seafood literacy: level of consumer's awareness and knowledge about the seafood industry and seafood products.

Sustainability and Eco-labels: consumer's perception of sustainability of the seafood industry, insights on consumer's awareness and perception about eco-labels, and search for sustainable, healthy, safe, and quality seafood products.

Trust: needs and tools of seafood traceability to gain consumers' confidence. Consumers' purchase intention towards traceable seafood and labelled products. Policies that regulate seafood traceability in Europe. Examples of traceability apps and platforms.

Engagement and Awareness campaigns: examples of seafood consumer engagement, win-win solutions, awareness campaigns

It is important to note that this bibliographic research does not aim to analyse all aspects of seafood consumption comprehensively. Nevertheless, it offers valuable insights into the subject.

3.4 MAIN FINDINGS OF THE LITERATURE REVIEW

3.4.1 CONSUMER'S NEEDS AND PURCHASING TRENDS

Consumption habits have changed dramatically in the last decades. In the modern, fast-paced world, people only have a little time for cooking. As a result, supermarkets and fish shops need to adjust to this trend. These facts are also supported by studies showing that consumers prioritise health benefits, taste, convenience, and process characteristics regarding food choices, including seafood (Mesnildrey et al., 2010). Vanhonacker et al. (2013) state that European consumers hold a favourable attitude towards fish products, primarily due to their perceived health advantages, especially in comparison with meat. The healthy image of fish is one of the main determinants for purchase, and wild fish, in general, has a more favourable impression compared with farmed fish in terms of health and nutritional value (Vanhonacker et al., 2013; Pupavac et al., 2022; Gaviglio et al., 2014; Cusa et al., 2021).

Farmed fish often face rejection due to concerns about their quality, while wild fish are rejected mainly because of sustainability and ethical considerations (Verbeke et al., 2007; Bacher et al., 2016). Aligned with this tendency, consumers prefer local or domestic products over foreign ones, which is another well-known trend for food in general, but of high importance when it comes to seafood because of the freshness status (Rodriguez-Salvador et al., 2023; Saidi et al., 2022).

When buying seafood products, consumers have a variety of behaviours, needs, attitudes as well as product attributes that influence their purchasing decisions, which are explained and summarised in Figure 6 (Olsen, 2008; Carlucci et al., 2015; Sacchettini et al., 2021; Zander & Feucht, 2018: Jacob et al., 2018; Stancu et al., 2022):

Figure 6. From awareness to behaviour change. Elaboration from bibliographic research findings.

Fish consumption is mainly the expression of ingrained habits that consumers perform without awareness and control. Therefore, consumers may show high or low levels of fish consumption simply because they have acquired a solid or weak habit of eating fish from the accumulated satisfactory/unsatisfactory past experiences and tend to maintain this habit relatively unchangeable during life (Carlucci et al., 2015).

3.4.2 SEAFOOD LITERACY

Seafood literacy refers to the level of knowledge and understanding consumers have about seafood, including its sources, sustainability, nutritional value, and environmental impact. Poor

seafood literacy means consumers need more knowledge in these areas (Perry et al., 2017; Cusa et al.,2021).

Species literacy is a new idea introduced by Hooykaas et al. (2019) that involves knowing particular species, including the ability to recognise them visually. This skill has been linked to increased fondness, respect, and admiration for the species. In essence, identifying and naming different species is crucial for developing a deeper connection with them. Seafood literacy also depends on various stakeholders' education and awareness efforts, such as government agencies, educational institutions, and seafood suppliers. If these entities fail to provide adequate information and resources to consumers, it can contribute to poor seafood literacy. Insufficient promotion of sustainable seafood practices, responsible fishing methods, and the importance of preserving marine ecosystems further exacerbates the knowledge gap (Hookyaas et al., 2019).

Awareness of traceability and labelling is crucial for consumers to make informed purchasing decisions. However, it also depends on their capacity to identify and distinguish the various fish species available on the market, which is an area that has yet to be thoroughly explored (Cusa et al., 2021). Frequently, seafood products are mistakenly grouped and labelled simply as "Fish"(Gaviglio et al., 2014) or are grouped into general categories or "umbrella terms" (Cawthorn et al., 2018), further complicating consumers' ability to learn about the product they are purchasing. Studies have shown that many consumers need to gain knowledge of the appearance of common fish species, highlighting a poor level of seafood and species literacy (Cusa et al., 2021).

Another element that seems eradicated in society are misconceptions about the seafood industry, which tend to project negative images onto the entire seafood sector. An example of this is consumers' perception of aquaculture: farmed products are often believed to be less fresh (Girard and Paquotte, 2003; Reig et al., 2019), which is of concern as freshness is a leading quality criterion for consumers (Batzios et al. 2002). The use of colourants and antibiotics in salmon farming has received much negative attention in the news, damaging the aquaculture industry's reputation as a whole. Consumers are susceptible to such information and tend to project this negative image onto the seafood sector (Vanhonacker et al., 2013).

It is also important to note that in this new millennium, modern lifestyles are causing consumers to become more disconnected from their food source, despite cultural habits (Scholderer et al., 2008). Many consumers are accustomed to purchasing pre-packaged seafood products from supermarkets or dining at restaurants without knowing the specifics of where the seafood comes from or how it was harvested (Nguyen et al., 2022). Direct involvement in the food production process is necessary to improve seafood literacy. Due to globalisation and industrialised food systems, certain types of seafood have become more readily available and popular, while others need to be more noticed (Hoerterer et al., 2022). Consumers may need to be made aware of sustainable seafood choices and may need access to a diverse range of seafood options. This limited exposure restricts their knowledge about different species, their nutritional benefits, and the environmental impact of their consumption.

Addressing poor seafood literacy requires collaborative efforts from various stakeholders. These include educational campaigns, improved labelling regulations, sustainable fishing practices, and increased consumer engagement. By enhancing seafood literacy, consumers can make more informed decisions about their seafood choices, support sustainable fishing practices, and contribute to the long-term health of our oceans and marine ecosystems.

3.4.3 SUSTAINABILITY AND ECOLABELS

Experts and consumers often understand sustainability differently due to its varying contexts and associations. Additionally, consumers may need more knowledge about the technical aspects of seafood production. To enhance communication with consumers about sustainability, it is crucial to understand their perspectives and expectations (Zander and Feutch, 2018).

Understanding the complexity of consumer psychology dynamics and how individuals perceive seafood consumption regarding nutrition and the environment is crucial for achieving sustainability goals and gaining consumer collaboration towards more sustainable food-related conduct and behaviour (Sacchettini et al., 2021). In today's market, an increasing number of consumers seek out products that possess additional attributes such as eco-friendliness, organic production, and domestic or European manufacturing (Larranaga et al., 2022, Teisl et al., 2008)

Studies by EEA (2016) & Zander/Feucht (2018) show consumers' growing interest in sustainable seafood. They make purchasing decisions aligned with sustainability criteria to contribute to the cause. In this sense, consumers play an essential role in conserving marine resources and driving sustainability and responsibility in seafood production (Penca, 2021; Roheim et al., 2018; Barclay and Miller, 2018).

In response to this growing awareness and demand for responsible practices, certification programs have emerged as a valuable tool to bridge the gap between consumers and sustainable seafood options (Stoll et al., 2019; Micheli et al., 2014).

These programs issue eco-labels that signify adherence to sustainable fishing practices, ensuring the protection of marine resources and mitigating environmental impacts. By displaying eco-labels on seafood products, certification programs empower consumers with information, making them more informed and eco-conscious choices when selecting their seafood purchases (Micheli et al., 2014). As the awareness of the importance of sustainable consumption continues to spread, the role of eco-labels in guiding consumers towards environmentally friendly seafood options becomes increasingly significant (Johnston et al., 2001; Salladarré et al., 2010; Giacomarra et al., 2021).

However, despite their good intentions, ecolabels can sometimes generate consumer confusion in the seafood industry due to several factors explained in Figure 7:

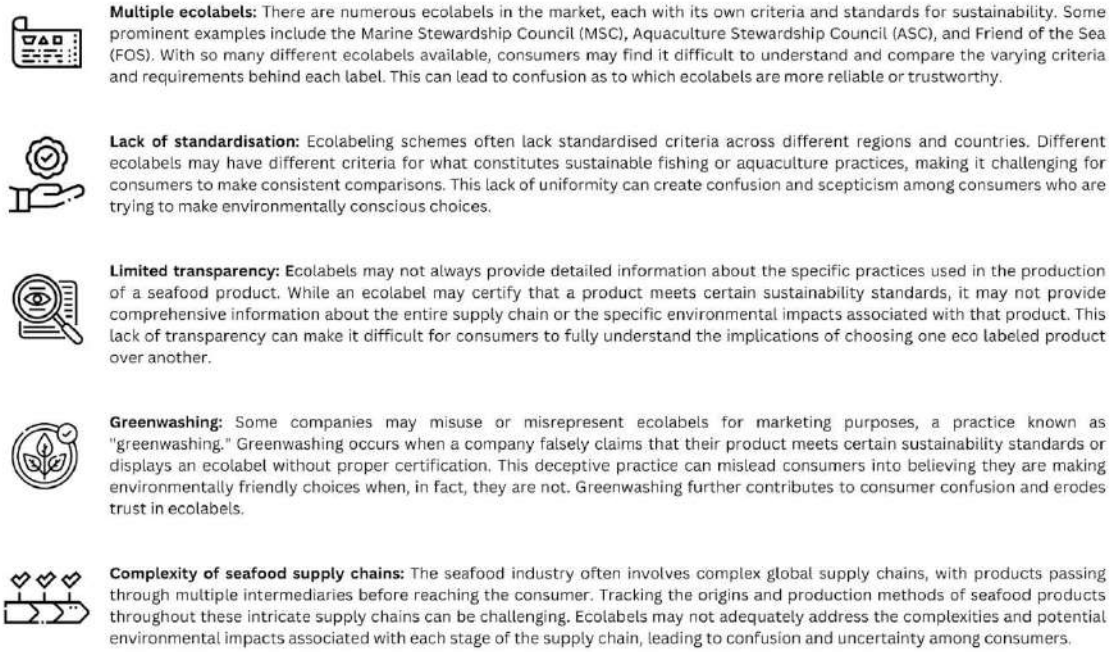


Figure 7. Factors that generate confusion among consumers about seafood labelling. Elaboration from bibliographic research findings.

3.4.4 TRUST

Consumers play a critical role in global supply chains, so providing accurate information about products is essential. This helps encourage industries to adopt sustainable production practices. The right to information for consumers means they should have access to adequate information to make informed choices based on their needs and wishes. This includes protecting from fraudulent or misleading practices and receiving factual information to make informed decisions (He, 2022).

In their paper "How to Define Traceability," Olsen and Borit (2013) offer a concise and precise definition of traceability. They define it as the capacity to access and retrieve specific information at any stage of an item's life cycle, facilitated by recorded identifiers.

Traceability is vital for businesses to meet government regulations on food safety, recalls, and country-of-origin labelling. Conversely, consumers rely on government regulations and brand reputation to ensure responsible sourcing, product safety, quality, and accurate labelling (Tamm et al., 2016).

Traceable seafood and labelled products provide consumers with a guarantee of food safety and quality assurance. With traceability, consumers can track the origin and processing of the product, ensuring that it meets established safety standards and regulations (Penca 2020; Alfnes et al., 2017). This knowledge helps build trust and confidence in the product, encouraging consumers to purchase.

The primary aim of traceability in food supply chains has been to regain or strengthen consumer trust by preventing or restricting the spread of food safety incidents (Sterling & Chiasson, 2014). However, the last 20 years have significantly changed consumer attitudes and trust toward corporate brands and the government. The following, taken from Tamm, 2016 summarises the significant changes within the seafood traceability system:

- Although the ideas behind Hazard Analysis Critical Control Point (HACCP) were developed decades earlier, it was in the 1990s that the first generation of HACCP for food traceability was implemented. HACCP focused on food safety, involved one-up-one-down[3] traceability, and was paper-based. The seafood industry needed to prioritize implementing HACCP, particularly for live shellfish like clams, mussels, and oysters, as these types of shellfish are especially susceptible to natural and artificial environmental toxins, making effective safety measures essential.
- The second generation of seafood traceability emerged in response to mounting apprehensions among consumers regarding the lack of trust in both government and business and an increase in environmental consciousness. In the 1980s, a significant movement was initiated to boycott canned tuna from fisheries that were detrimental to dolphins. This campaign resulted in the creation of the "dolphin-safe" ecolabel in 1990, followed by the introduction of the first certification, the Marine Stewardship Council (MSC), in 1996. These certifications were implemented as a market-based solution to address both actual and perceived inadequacies by the government and businesses in sustainably managing fisheries.
- Traceability entered its third generation in the mid-2000s, driven by significant technological advancements, concerns about illegal fishing and seafood fraud in the market, and changes in consumer preferences. During this period, cloud-based software that enables full-chain traceability was introduced. Consumers can now track the origin of their seafood through websites and smartphone applications.

Over the last ten years, many electronic traceability systems have been created that allow the public to trace their products. These systems often include mobile apps, websites, scannable QR codes, or traceable alphanumeric codes for online engagement.

Since the mid-2000s, consumers have had more opportunities to trace their food products. However, there is limited data and research on the consumers who are most likely to engage in tracing, their motivations, and their response rates when given a chance to trace their products (Tamm, 2016).

[3] One-up- one-down means that food and feed business operators can identify from whom they have been supplied with a food, feed, or food-related item (one-down), and they can identify to whom their products have been supplied (one-up).

In Europe, seafood traceability is regulated by several policies and regulations aimed at ensuring the sustainability of fisheries, protecting consumers, and combating illegal unreported, and unregulated (IUU) fishing. Some of the key policies and regulations governing seafood traceability in Europe include:

- Common Fisheries Policy (CFP): The CFP is the primary policy framework for managing fisheries in the European Union (EU). It includes provisions for traceability and aims to ensure sustainable fishing practices, promote transparency, and combat IUU fishing.
- Regulation (EU) No. 1379/2013 on the Common Organization of the Markets in Fishery and Aquaculture Products: This regulation establishes rules for the marketing and trade of fishery and aquaculture products within the EU. It includes provisions for traceability, labeling, and the information that must be provided to consumers.
- Regulation (EU) No. 508/2014 on the European Maritime and Fisheries Fund (EMFF): The EMFF supports the implementation of the CFP and provides funding for various measures, including those related to traceability and control of fishing activities.
- Regulation (EU) No. 2017/2403 on the Sustainable Management of External Fishing Fleets: This regulation aims to ensure the sustainability of fishing activities by EU vessels operating outside EU waters. It includes provisions for traceability and control of catches.
- Regulation (EU) No. 1005/2008 on Illegal, Unreported and Unregulated Fishing (IUU Regulation): The IUU Regulation aims to prevent, deter, and eliminate IUU fishing practices. It includes provisions for traceability, certification, and import control of fishery products.
- Regulation (EU) No. 2019/1241 on the Conservation of Fisheries Resources through Technical Measures: This regulation establishes technical measures to protect fish stocks and promote sustainable fishing practices. It includes provisions for traceability, recording and reporting of catches, and the use of electronic systems for data collection.
- Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy: came into force in 2010 to provide a system of monitoring, inspection and enforcement for fishing operations in EU waters and activities of the EU fleet globally.

These regulations, among others, contribute to establishing comprehensive traceability systems in Europe's seafood supply chain, enabling tracking of fishery products from their source to the consumer. They enhance transparency, promote sustainable practices, and help combat illegal fishing activities. The European seafood traceability policies are subject to ongoing evolution, with regulations that can undergo dynamic changes over time.

Many companies use traceability information to promote their seafood products, and consumers are becoming more interested in the story behind the seafood. Companies are sharing more information through social media, websites, and in-store displays to meet this demand. Some private companies and third-party solutions offer web-based interfaces that integrate with supply chain traceability tools to give customers transparency about the source of their seafood, including information about the fishers who harvested it. These systems use unique identifiers

to track products by shipment, batch/lot, or individual fish. Customers can access this information on the packaging, through phone applications, QR codes, or by entering a code on the company's website (Lewis & Boyle, 2017).

The following Table 1, provides examples of seafood traceability apps and websites for consumers to support them in making responsible decisions when buying seafood:

Table 1. List of app and website for consumers

Name	Short description	Link
GulfWild	TransparenSea is a real-time web interface that takes seafood traceability to new levels. While the boats are on the water, and as soon as the fish are landed, comprehensive data transfer employing the TransparenSea system takes place, capturing, compiling and sharing information about each and every fish that is caught. This program is especially important to retailers, restaurateurs and consumers who want to know more about the integrity and authenticity of the fish they purchase.	https://www.gulfwild.com/Main/Programs/TransparenSea
Verifik8	Designed as a user-friendly mobile and web application, Verifik8 enables real-time data collection from your farms, suppliers, and processors. Using an extensive number of indicators, aligned with industry- and commodity-relevant standards and conventions, Verifik8 monitors the socio-environmental responsibility of your farms.	https://www.verifik8.com/
Shellcatch	Through Shellcatch fisheries management and control tools, companies can validate and show their responsible fishing practices to end consumers	https://web.shellcatch.com/ecommerce
ThisFish	An online Trace app by Ecotrust to empower consumers to trace their seafood back to the harvester who caught it	https://this.fish/about/our-story/

Name	Short description	Link
FishTrax	By entering some simple information into the FishTrax platform, you can find your fish - and in the process, learn about the community of people, starting with the fisherman and crew.	https://marketplace.fishtrax.org/fyf
SeaFood Watch	A web-based platform powered by Monterey Bay Aquarium which help consumers in taking informed choices	https://www.seafoodwatch.org/
Ethic Ocean	Mobile application powered by Ethic Ocean, which publishes each year the Species Guide for professionals (chefs, fishmongers, supermarkets, etc.) to help them obtain sustainable supplies and thus preserve the resources of the ocean. The Ethic Ocean app is intended for the general public and consumers who wish to consume while respecting marine resources. The app helps you choose seafood products (fish, crustaceans, molluscs) from sustainable fishing or responsible aquaculture	https://www.ethic-ocean.org/application-ethic-ocean/

3.4.5 CONSUMER ENGAGEMENT AND AWARENESS CAMPAIGNS

The concept of sustainable consumption is closely linked to sustainable production, and both have been reintroduced as Goal 12 in the United Nations' 2030 Agenda for Sustainable Development, adopted in 2015. It is important to note that sustainable production addresses the issue of pollution and environmental degradation, whereas sustainable consumption emphasises the need to monitor our consumption levels and patterns.

Eco-labelling is the dominant market-based tool for educating consumers on environmentally responsible choices. However, voluntary information disclosure has been found to, at best, consolidate the existing set of eco-sensitive consumers rather than expand environmental awareness society-wide (He, 2022). To promote responsible seafood consumption and sustainability, an engagement process is necessary. This process should focus on increasing public awareness and encouraging stakeholders to adopt sustainable practices. This includes influencing consumer behaviour towards sustainable options (Balan et al., 2021).

To promote transparency and consumer engagement, States should focus on:

- improving their national Internet infrastructure,
- expanding distribution networks,

- encouraging the use of interactive tools on personal mobile devices.

These tools can range from simple QR codes to more advanced augmented reality experiences for shopping and dining. Additionally, sustainability education programs that utilise interactive, audio-visual, and community-based approaches can be effective in smaller settings.

Product information and traceability systems are in high demand as people seek to take control of their sustainability literacy. Retailers, processors, and distributors must collate and customise key messages for consumer-friendly interfaces. By doing so, retailers can confidently communicate their roles to consumers in physical and online stores, ultimately promoting sustainability on a broader scale. Improved visual accessibility will be crucial in achieving this goal (He, 2022).

Several NGOs and aquariums have started campaigns to influence consumer behaviour towards sustainable seafood. These campaigns include seafood wallet cards allowing consumers to identify which fish are ecologically better and worse. These campaigns aim to discourage the consumption of non-sustainably caught seafood and to help revive fish stocks that are in danger of collapsing (Jaquet et al., 2007), and aiming to make consumers more responsible for their choices, influence seafood companies, and drive regulatory policy changes.

Table 2 provides examples of awareness campaigns addressing consumers and stakeholders of the last part of the value chain to promote responsible consumption and support the traceability of the seafood value chain.

Table 2. Examples of awareness campaigns and initiatives addressing consumers and other relevant stakeholders

Name	Short Description	Link
FishForward	WWF's campaign, active in 11 European countries, raises awareness about overfishing and promotes sustainable seafood choices. The campaign aims to empower consumers to contribute to a more responsible global economy by making conscious and independent choices to buy sustainable products. It includes public events, educational programs, and information dissemination through various media channels.	https://www.fishforward.eu/en/fish-forward-project/the-project/

GoodFish Guide	A Campaign, powered by the Marine Conservation Society, promotes sustainable seafood choices by engaging with stakeholders like retailers, restaurants, and consumers to encourage responsible sourcing and fishing practices.	https://www.mcsuk.org/goodfishguide/
#FollowTheFish	The Follow the Fish movement, backed by Oceana, unites chefs, seafood businesses, and consumer organizations to urge EU decision-makers for transparent information on the sustainability of fish we buy and eat.	https://europe.oceana.org/follow-the-fish/
Ocean Action #47382	The Portuguese fish valorization project, led by Docapesca, enhances sustainable and nutritionally rich species through awareness campaigns. These campaigns involve "above the line" media like television, press, and social networks, as well as "below the line" actions with local Chefs promoting product experimentation in markets, supermarkets, and festivals with a total of 40 annual actions.	https://sdgs.un.org/partnerships/continue-raising-awareness-sustainable-fish-consumption-till-2030
Cephs&Chefs	The project aims to: a) Enhance cephalopod products through new initiatives and market opportunities. b) Understand the entire value chain and factors affecting sustainability, both short and long term. c) Study consumer habits and acceptance of new cephalopod food products in North and South Europe. d) Ensure fishing sustainability by evaluating stocks, fisheries, and ecosystems using biological and socioeconomic indicators.	https://www.cephsandchefs.com/

4. STAKEHOLDER IDENTIFICATION

4.1 STAKEHOLDER IDENTIFICATION FOR WP2

Having an agreed definition of the stakeholder concept is crucial for paving the way for the stakeholder engagement strategy. As already mentioned in D1.1, SEA2SEE adopts the broad definition of stakeholders as follows:
Stakeholders are individuals and organisations actively involved in the SEA2SEE solution design and development or whose interests may be positively or negatively affected as a result of the solution execution or successful project completion.
More specifically, WP2 consider as relevant stakeholders individual persons, organisations, private companies and the general public (consumers) who are actively involved in:
- buying and/or consuming seafood,
- promoting responsible seafood consumption
- promoting seafood sustainability
- create an awareness campaign on seafood sustainability.

4.2 GUIDELINES FOR IDENTIFICATION, SELECTION AND PRIORITIZATION OF STAKEHOLDERS

To successfully run the SEA2SEE project, it is crucial to identify and select the appropriate stakeholders. To supplement the information provided in D1.1 regarding Stakeholder Engagement, WP2 carried out several activities with partners to get a more detailed map. During the brainstorming phase, the focus was primarily on stakeholders directly involved in the seafood value chain's final stages, such as consumers and supermarkets, and secondary stakeholders who may have some level of influence or relationship with them, such as NGOs and media outlets.
To involve our partners in the process, WP2 organised a brainstorming session to generate a list of potential stakeholder groups for targeted WP2 actions. The following is a non-exhaustive list of stakeholder groups identified during this process:

1. Individuals & consumers segments
2. Public Administration & Institutions
3. Consumer clusters (groups of consumers, eco-consumption groups, local associations)
4. Supermarkets (small, medium, big size)
5. Public markets (e.g., fish auction, local markets, Fishmongers)
6. HORECA
   6.1 Hotels
   6.2 Restaurants (owners and chefs)
   6.3 Catering companies
7. Social services and municipalities (e.g., public places where food is offered for low-income citizens)

8. Canteens (e.g., in schools, universities, public administration premises, private companies)
9. Cooking Schools
10. Knowledge Brokers
11. Consultancy and advocacy organisations or individuals
12. NGOs
13. Twin project & similar initiatives
14. Networks (e.g., COST Actions)
15. Media
    - 15.1 Local & National press agencies
    - 15.2 TV & Radio Shows (e.g., podcasts)
    - 15.3 Food & Sustainability Influencers
16. Seafood ambassadors
    - 16.1 Food Influencers
    - 16.2 Food writers
17. Educational stakeholders
    - 17.1 Formal education (private and public)
    - 17.2 Non-formal education

This list covers various stakeholders relevant to seafood consumption, promotion, education, and awareness. It encompasses diverse actors, from individual consumers to media, influencers, and advocacy organisations. Engaging with these stakeholders can achieve a more holistic and practical approach to promoting sustainable seafood consumption.

After identifying a list of stakeholder groups, WP2 partners agreed upon criteria and characteristics to prioritise stakeholders. These criteria serve as a checklist for selecting new stakeholders based on their nature, commitment, and interests.

We selected a set of primary criteria that could be met in their totality or only partially. According to this, stakeholders that meet all the requirements should be preferred. However, extra efforts will be made to engage with stakeholders that only partially meet the criteria to scale up the impact of the SEA2SEE project.

The interdependence of the criteria "**Linkage with Seafood**" and "**Interest in Sustainability**" generates opportunities for engagement at different multi-stakeholder levels, with the third criterion ", Technology minded", as an asset for increasing the engagement success rate.

We selected the "Linkage with Seafood" as the primary criterion: choosing stakeholders with a direct or indirect relationship with the seafood world is essential. To maximize engagement, it's best to interact directly with stakeholders in the seafood industry, including end-consumers, retailers, and media. Complementary efforts should target those with indirect contact to promote behaviour change and increase consumer acceptance. Stakeholders in the broader food cluster will also be considered.

Furthermore, we selected the "**Technology minded**" aspect as relevant for the prioritisation. The SEA2SEE project has a robust technological component, and we envisage engaging primarily with stakeholders that have a particular interest in technology or might gain interest in technology-based tools. The WP2 engagement activities will give visibility to the SEA2SEE technology system for traceability, providing the stakeholders with information and tools to make informed decisions and shift to sustainable practices.

We positively value the selection of stakeholders that hold an "Interest in Sustainability", given that in the SEA2SEE project, sustainability is a core component. Strategic engagement of stakeholders already involved in sustainability or that might be involved in such narratives effectively channels WP2 efforts. One of the engagement objectives indeed is to raise awareness of the importance of seafood sustainability, so WP2 engagement actions will also target those stakeholders that might not have had any first-hand experience or contact with the subject but that still meet the "Linkage with seafood" or the "technology minded" criteria.

We also identified a set of complementary criteria that could be useful for the identification of individuals or groups of stakeholders as targets for the engagement activities. The interest of stakeholders in one or more of these is a fertile ground for engaging with the SEA2SEE project.

The **attentiveness to transparency and traceability systems** is an asset, especially for supermarkets and restaurants, but also for consumers as an answer to their needs and expectations regarding being informed about seafood products. This criterion goes hand in hand with the following - **reputation** - which can be considered a core value of strategies to gain the loyalty of consumers, especially in supermarkets and restaurants.

A new set of criteria has been identified to engage stakeholders in the seafood industry. An existing **interest in seafood topics** such as seasonality of seafood, local production or Protected Designation of Origin is positively valued. This applies to consumers and consumer segments, supermarkets and HoReCa representatives that might be already prone to listen to such narratives, thus facilitating the engagement success rate. Another example is an **interest in seafood labelling** and its connection to traceability.

1. Primary
    1. Linkage with Seafood (mandatory)
    2. Technology minded
    3. Interest in Sustainability
2. Secondary
    1. Transparency and traceability
    2. Reputation
3. Tertiary
    1. Seafood labelling
    2. Seasonality of seafood production
    3. Local production & Protected Designation of Origin (PDO)

4.3 STAKEHOLDERS MATRIX

Stakeholders in WP2 are categorized based on the involvement criteria outlined in Deliverable D1.1.

- **Level I.** This level includes "Informed" stakeholders, i.e., those provided with information related to SEA2SEE. Communication with these stakeholders is one-way.

- **Level II.** This level includes "Involved" stakeholders, i.e., those directly working with SEA2SEE partners throughout the SEA2SEE design pipeline. Communication with these stakeholders is two-way, where both sides exploit learning.

- **Level III**. This level comprises "Cooperative" stakeholders, i.e., those driving the research and development of the SEA2SEE solution. This level includes all internal SEA2SEE stakeholders.

During the 1-day multi-stakeholder workshop in Spain (see section 5.1.3 for more information), the participants identified and validated the different stakeholder groups, following these steps:

- A list of stakeholder groups, including those at the end of the value chain, was provided to participants.
- The participants were requested to point out any new stakeholder groups that needed to be included.
- The stakeholder group was divided into three levels of involvement (informed, involved, and cooperative) based on the SEA2SEE project's WP2 objectives and actions.
- Participants were asked to locate stakeholders' groups in a Power vs Interest matrix, as seen in Figure 8.

To create this matrix, the workshop participants categorized stakeholders based on their level of interest in the issue (low to high) and their level of power or influence (low to high).

This matrix helps identify which stakeholders have the most significant impact and interest in promoting responsible seafood consumption enabling the partners to prioritise engagement and collaboration efforts accordingly.

Here's a breakdown of the different stakeholder categories:

- *High Power, High Interest:* These stakeholders are influential and intensely interested in promoting responsible seafood consumption. They can influence decision-making, and their interests align with sustainable seafood practices. Engagement with this group is critical, as their support and alignment can significantly drive change and foster responsible practices.

- *High Power, Low Interest:* Stakeholders in this category may have significant power and influence, but their primary interests do not directly relate to responsible seafood

consumption. Engaging them may be necessary, but they may not be proactive champions of the cause.

- *Low Power, High Interest:* These stakeholders are genuinely interested in promoting responsible seafood consumption but may lack the necessary power or influence to drive substantial change on their own. However, their support can still be valuable, especially when forming partnerships or coalitions to implement actions.

- *Low Power, Low Interest:* This category includes stakeholders with minimal interest and influence in the responsible seafood consumption initiative. They may have little impact on the outcome, and engaging with them might not yield significant results.

Figure 8 summarises the results of the exercise completed for the Spanish context:

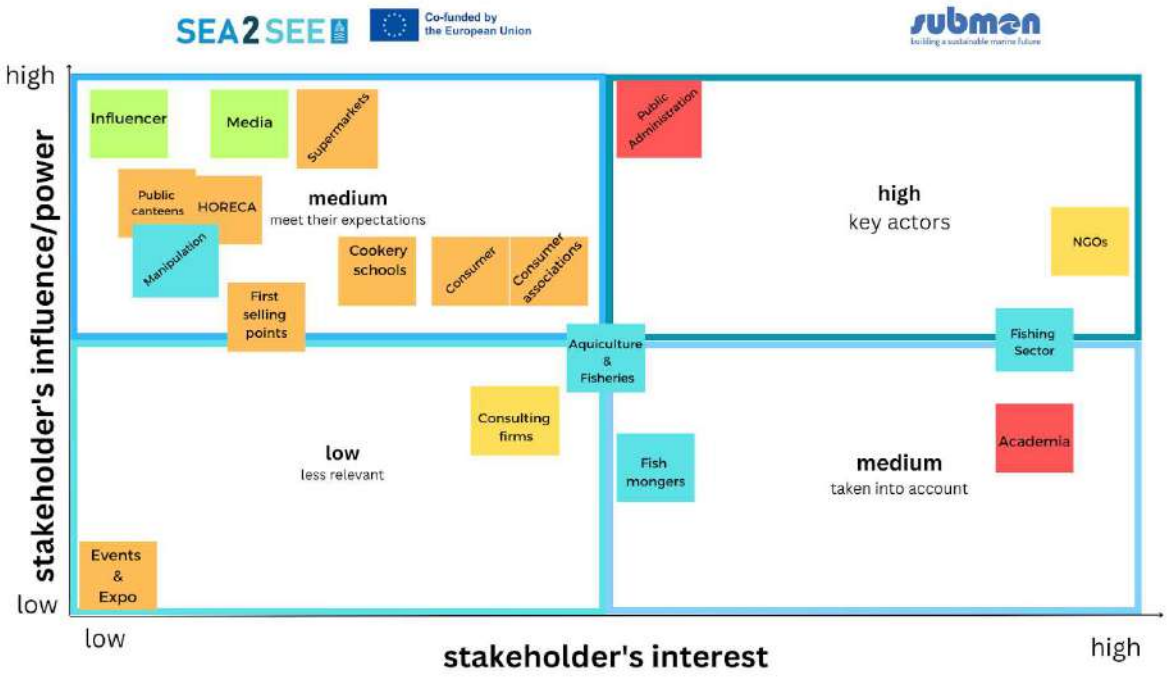


Figure 8. Results of the exercise of identification of stakeholders in a power vs interest matrix.

One possible strategy to promote WP2 objectives is to focus on Media and Influencers. These individuals strongly impact consumer choices but may not be naturally interested in topics like this. Targeting them could be a mutually beneficial strategy. Supermarkets hold significant sway over consumer behaviour through their marketing strategies, which can push the sale of certain products. However, their interest in sustainability may be limited. The same can be said for restaurants and other HORECA representatives, who also have the power to influence consumer choices but may still need to be fully committed to sustainability narratives. In these examples, the engagement strategy aims to increase their interest, bringing them into the quadrant High-Key actors. NGOs can be interested in the project and its objectives, thus becoming good allies in spreading its message. However, their power depends on specific contexts. Consumers are a

primary target of the SEA2SEE stakeholder engagement actions to increase their interest in the sustainability and traceability of seafood products.

A more detailed linkage from this matrix to SEA2SEE engagement actions can be seen in Table 3.

5. IDENTIFICATION OF BARRIERS TO RESPONSIBLE SEAFOOD CONSUMPTION AND PRODUCT ACCEPTANCE

To better understand the challenges faced by European consumers when it comes to seafood consumption, a co-creation process was conducted to prioritise existing barriers and align with the reality of the project countries.

5.1 COLLECTIVE INTELLIGENCE PROCESS (FROM BARRIERS TO ACTION)

Partners used a Collective Intelligence (CI) methodology to involve target group(s) in active, direct participation in the SEA2SEE project. CI is a barriers and value structuring methodology. CI involves critical learning, reflection, and action to enable co-creation with people. Interpretive Structural Modelling (ISM) software facilitates the consultation process. As shown in Figure 9, CI takes participants through four stages: Barrier Generation, Barrier Categorisation, Structuring Barriers, and Generating Options. The ISM software package is utilised during the Barrier Structuring phase: the participants answer a series of relational questions to determine the most aggravating barriers and develop a structural map as the outcome. As part of the SEA2SEE project, we employed this methodology across four countries: France, Greece, Portugal, and Spain, where most of the pilot sites are located. Each partner received prior training to use the methodology, so each workshop could be held in the native language.
For further details about the process, please refer to the Collective Intelligence manual (https://zenodo.org/record/8206979).

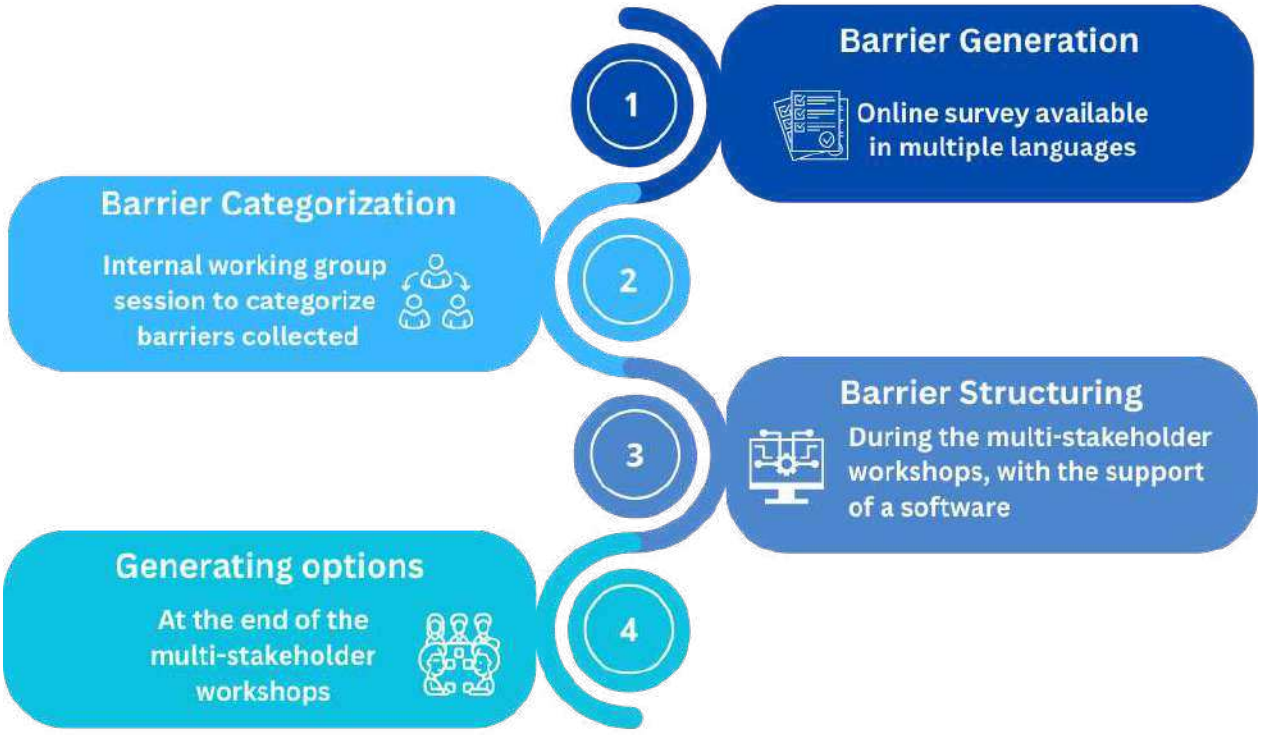


Figure 9. Phases of the Collective Intelligence Process. *1. Online Barrier Generation, 2. Barrier Categorization, 3. Barrier Structuring, and 4. Generating options.*

5.1.1 BARRIER GENERATION – SURVEY DESIGN AND IMPLEMENTATION

SUBMON developed the questionnaire with Ethic Ocean to identify and explore general barriers to responsible seafood consumption and product acceptance in Europe. The information gathered with this survey was used as a baseline for the 1-day multi-stakeholder participative workshops in France, Greece, Portugal, and Spain as part of the Collective Intelligence methodology.

The questionnaire consisted of 4 sections:

- **Section 1** aimed to profile purchasing/consumption habits from respondents and collect data on the knowledge and awareness of seafood consumption.
- **Section 2** was to gather barriers to responsible seafood consumption and product acceptance.
- **Section 3** was to gather demographic information of respondents.
- **Section 4** explored future engagement in the SEA2SEE project.

Two main questions were used to gather barriers:

1. As a consumer, what do you think is lacking for achieving sustainable seafood consumption (both wild captured and farmed)?
2. Based on your experience, what factors are limiting your purchasing of sustainable seafood products?

It is worth mentioning that a discussion arose around sustainable seafood consumption vs. responsible seafood consumption. Although both are related concepts and aim to address the

environmental, social, and economic impacts of consuming seafood, they focus on slightly different aspects of seafood consumption.

Many argue that, semantically, consumption is responsible while production is sustainable, and it is meaningless to define sustainable consumption if production is unsustainable.

Responsibility is in the hand of retailers and end-consumers' choices, while sustainability is in the hand of producers and other actors upstream in the seafood value chain.

Given that there is a lot of fuss around these two concepts and no accepted definition, they have often been used interchangeably in our work. However, we realized that for the engagement strategy of the WP2, it is helpful to define responsible consumption as an attitude that involves making well-reasoned decisions about the seafood products we buy, considering a set of criteria to support our choices.

This concept goes hand in hand with product acceptance, which highly depends on consumers purchasing behaviors and is strictly linked to the cultural importance of seafood in the diet, consumers' sustainability concerns, knowledge, seafood literacy, and market demands.

With the questionnaire, we analyzed current barriers to responsible seafood consumption and consumer non-acceptance of EU seafood products to build a strategy for increasing trust and promoting seafood literacy.

The EU Survey tool, an online survey-management system offered by the European Commission, was used to create and deliver the survey. The questionnaire was translated into Catalan, French, Greek, Portuguese, and Spanish to ensure broader coverage in the involved countries. Each partner contributed to the translation, considering the diverse consumption habits and characteristics of the different countries, which can often be challenging. The questionnaire took approximately 5 minutes to complete. A copy of the survey is enclosed as an Annex 9.2.

We are pleased to report that the survey received an outstanding response from the general public, with 363 answers submitted.

Figure 10 shows an overall view of the demographic data of respondents in each country, together with trends of purchasing and consumption. For further information about the demographic data, please see the workshop reports in the Annex 9.3.

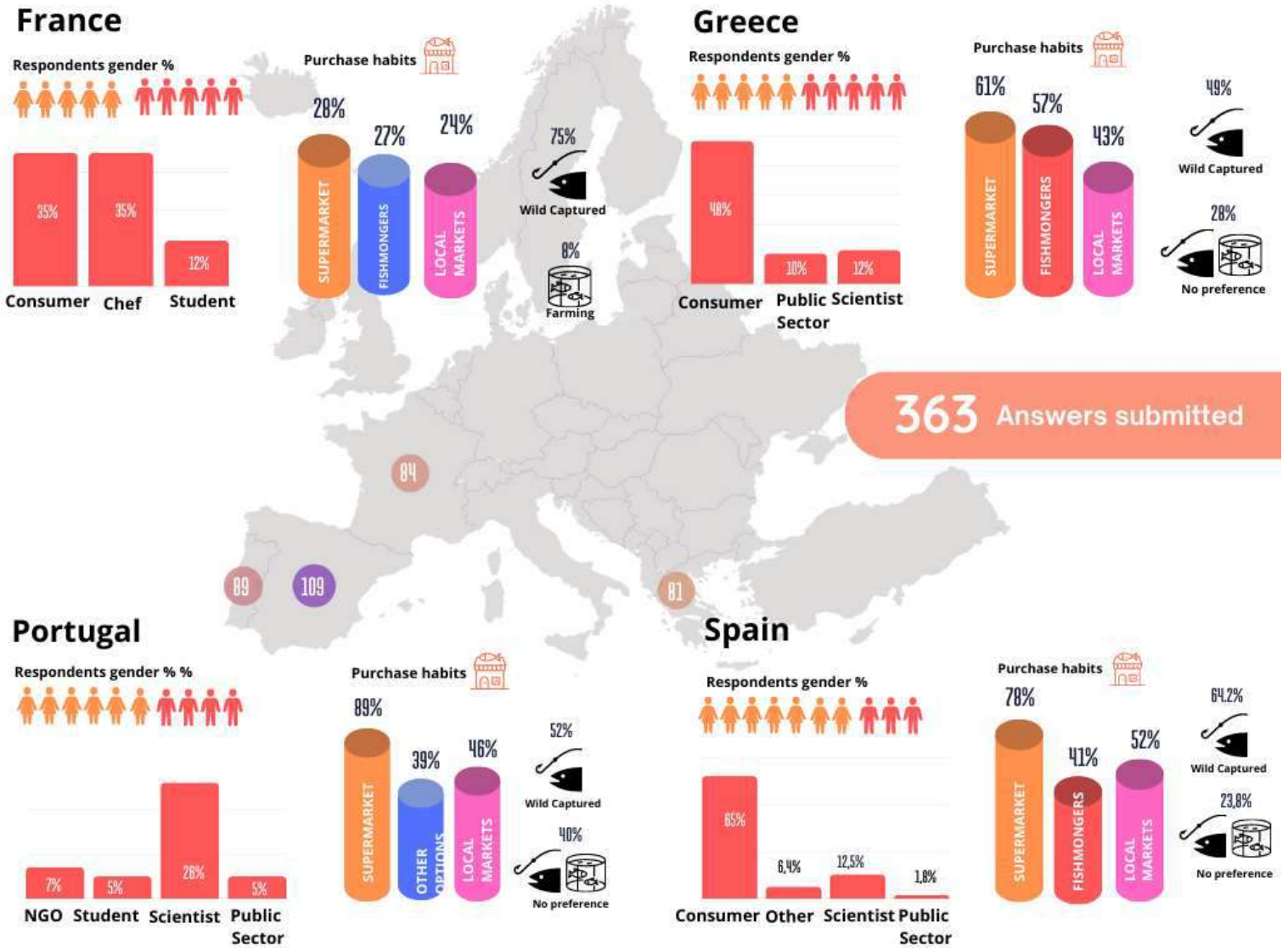


Figure 10. Overview of the demographic data of respondents and purchase habits in France, Greece, Portugal and Spain.

5.1.2 TRAINING ON COLLECTIVE INTELLIGENCE AND ISM SOFTWARE

SUBMON provided training to partners for the smooth implementation of the CI process (Figure 11) to identify and prioritize barriers to responsible consumption and product acceptance in Europe. Partners were trained during in-person sessions to establish the consultation process and use ISM Software. This open-access software package identifies relationships among barriers and imposes structure to manage complexity.

Figure 11. Moments of the Collective Intelligence training session with WP2 partners in France, Greece, and Portugal.

To facilitate the training sessions, SUBMON developed a manual of the consultation process with instructions, best practices and tips for delivering the 1-day multi-stakeholders' workshops (To see and download the manual: https://zenodo.org/record/8206979). (To see and download the manual: https://zenodo.org/record/8206979).

5.1.3 1-DAY MULTI-STAKEHOLDERS WORKSHOPS

Once received answers to the survey, partners organised four Collective Intelligence Workshops:

- 10th May- Spain, Barcelona
- 12th May - Greece, Athens
- 18th May - Portugal, Lisbon
- 14th June - France, Paris

The main objectives of the workshops were:

- To work together to understand barriers.
- To work together to generate options to overcome barriers.

Each partner selected and invited a variety of stakeholders representatives, to ensure an engaging discussion and to hear from different perspectives, as shown in Figure 12 and Figure 13.

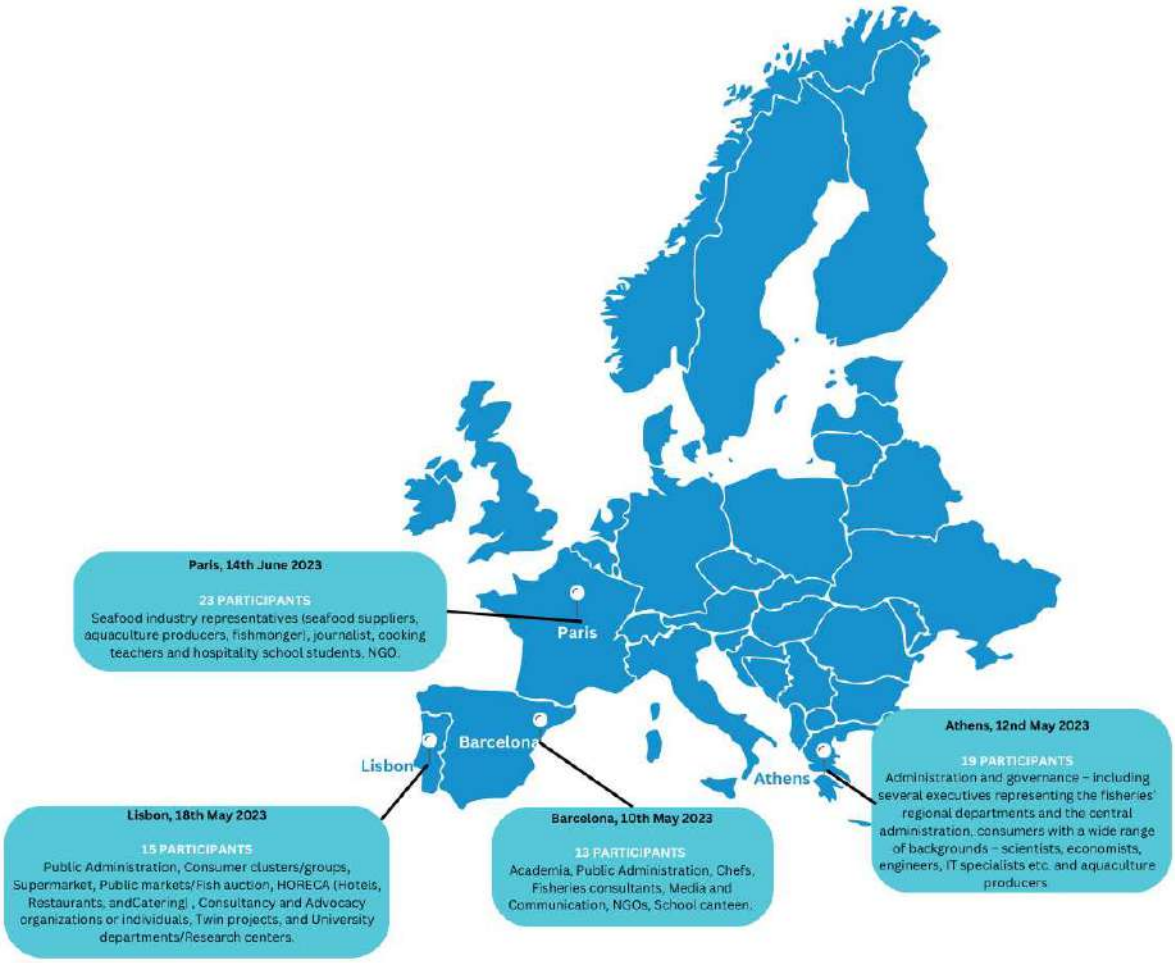


Figure 12. Map of the 1-day multi stakeholder workshops in France, Greece, Portugal and Spain, and participants description.

Figure 13. Moments of the 1-day multi-stakeholder workshops that took place in France (Paris), Greece (Athens), Portugal (Lisbon), and Spain (Barcelona).

5.1.4 BARRIERS ANALYSIS

Analysing the list of barriers and the final structural maps generated during the workshops, it appears clear that some categories of barriers to responsible consumption and product acceptance are common in different countries. Figure 14 shows the categories of barriers identified in each country:

Figure 14. Categories of Barriers approved in each country during the 1-day multistakeholder Workshop.

From an analysis of categories in the different countries, it resulted that there are nine areas of interest, which are summarised in Figure 15 below:

Figure 15. The Big Nine on Seafood Consumption.

One of the most common categories in the countries is the lack of traceability information on seafood, which is also linked to the misunderstanding and confusion generated by labels. On top of that, the lack of seafood literacy and education of consumers is also common in all countries, which seems aggravated by a lack of proper information toward consumers on product features and traceability information. Related to these categories is also the pool of obstacles linked to consumption habits and trends, which are sometimes very rooted in consumers and are difficult to change.

Another category of barriers that appears frequently is related to the economic aspects of the seafood industry, i.e., the lack of explained information about prices and a mismatched perception between price, quality and value of seafood. The affordability of seafood plays a crucial role in influencing consumers' choices when purchasing and consuming seafood products. Also, clever marketing and branding strategies can influence consumers' perceptions of seafood products, affecting their willingness to pay a premium for specific brands or seafood varieties, especially during certain seasons (e.g., Christmas festivities).

It is worth noting that a perception of a lack of legislative support is also identified as a primary obstacle to sustainable consumption in different countries. Poor governance and management mechanisms in fisheries and aquaculture hinder sustainable production and consumption.

Ethics is another aspect that influences seafood consumption: as people become more aware of ethical concerns surrounding the fishing and seafood industry, their choices and behaviours may change.

Also, many barrier statements are almost identical within the categories in the different countries, highlighting that there are shared obstacles which joint initiatives and actions can tackle. Examples of common barriers are:

- Absence of substantial control from the origin to the selling points.
- Failure to implement transparency and traceability along the value chain.
- Lack of correct information that reaches consumers (info on stock status, optimal consumption, respectful fishing gear, local species, species diversity, social aspects, seasonality, morphology).
- Lack of seafood literacy, and consumers education and awareness.
- Prejudice about aquaculture products.
- Unreliable labels that generate confusions rather than guiding consumers.
- Lack of concrete State involvement through information and obligation measures.
- Lack of explanation about the price of products and its relationship with sustainability.
- Morphology of the fish as an important barrier to purchasing and consumption.
- Lack of sustainable offers on the shelves.
- Lack of diversity of seafood products.

Figure 16 presents the barriers that during the workshop were considered as the most relevant, and therefore selected for the barrier structuring process:

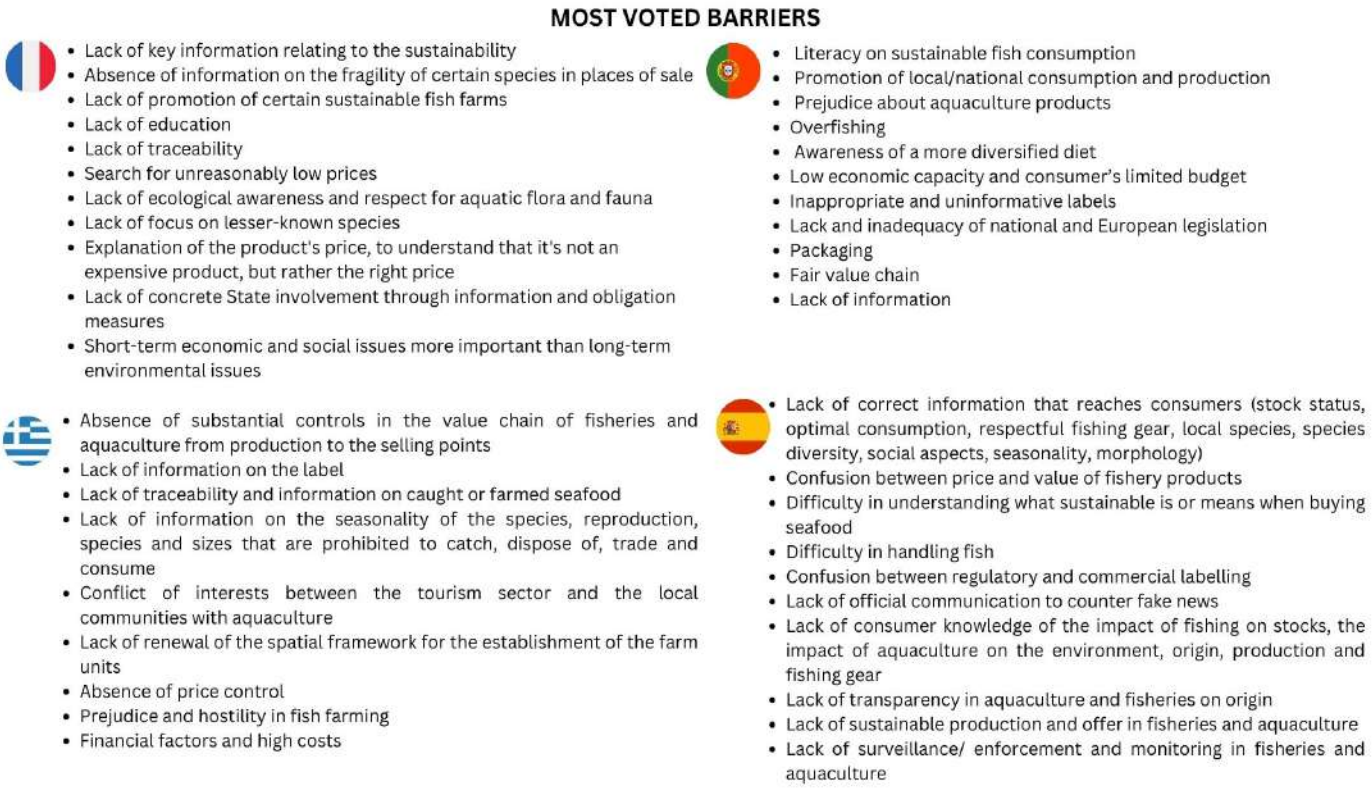


Figure 16. Compilation of the most voted barriers in each country during the 1-Day Multistakeholder Workshop.

5.1.5 STRUCTURAL MAPS

The section below analyses the structural maps generated in each country during the workshop. The structural map is read from left to right, with barriers on the left having the most aggravation.

Multiple paths of aggravation may need to be described, depending on how complex the structure is. Some barriers may be in cycles, i.e., with two or more barriers appearing together in a box, which means these barriers are reciprocally interrelated. For further information about the barrier Structuring process, please read the workshop reports included as Annex 9.3

France

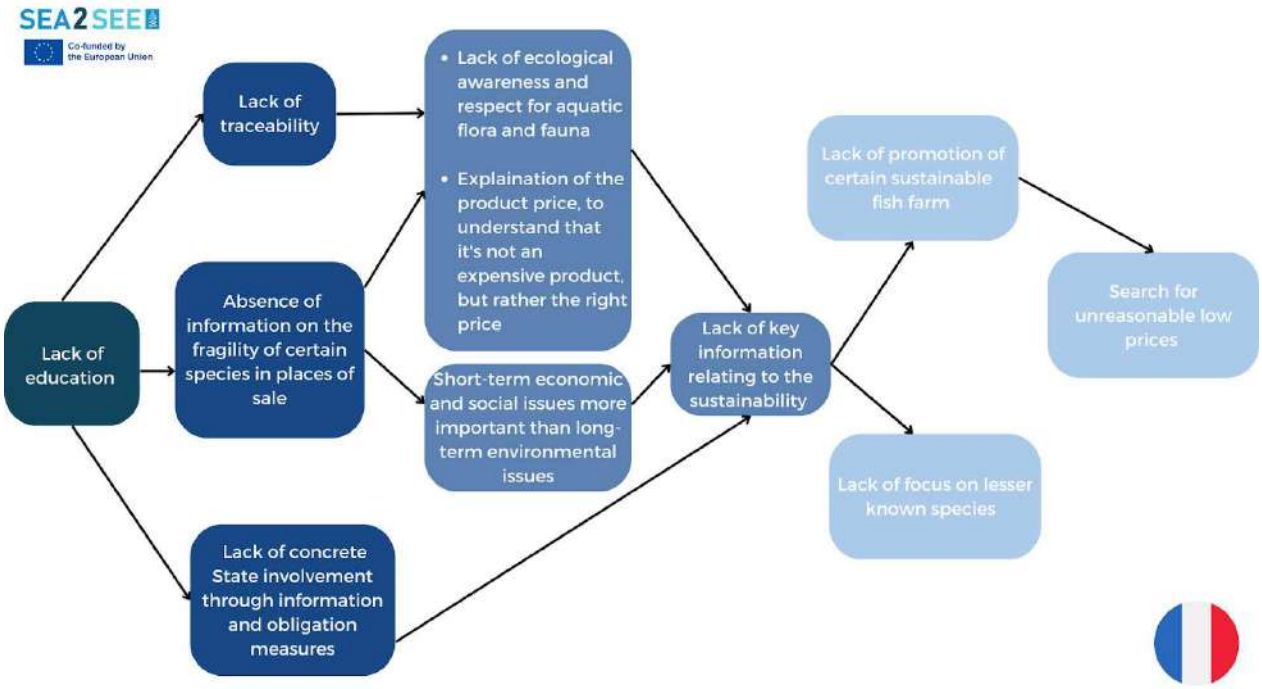


Figure 17. Structural map of Barriers generated in France.

The process of comparison between the different barriers, following the ISM software protocol, has been done. However, this part was questioned by several participants as the process of comparison did not make sense for some of them. Furthermore, the final result was also discussed as the generated graph was not coherent with their analysis from the discussions.
A second graph had to be made, it was better but, but still it did not completely convince the participants either.
Then the graphic below reflects what the participants estimated as the best relations between barriers.

⇨ The “lack of education” is the most important barrier to move towards greater sustainability. This barrier exacerbates the other three major barriers, i.e. “lack of traceability”, “lack of information on the fragility of certain species in places of sale” and “lack of concrete State involvement through information and obligation measures”.

“Lack of education” is the main obstacle, as without education it is difficult if not impossible for consumers to understand why it is necessary to buy sustainable seafood products. Or to know how to do it. And if consumers do not know that it is vital to preserve the sea's resources, why should we change our consumption habits? Then this criterion appears to the participants as the most important one.

⇨ Level 2

“Lack of traceability”. Traceability is an essential tool for assessing the sustainability of a seafood product. Without this information, consumers are prevented from making sustainable purchases, as they cannot find the essential information needed to judge sustainability (fishing zone, fishing technique, etc.). Furthermore, even if European regulations require traceability on labels, it is not uncommon to see incomplete labels on stalls.

- “Absence of information on the fragility of certain species in places of sale”. If consumers are not aware that a species is threatened, they cannot take it into account when making their purchases. This criterion is closely linked to the "Lack of education" criterion. For example, cod is one of the flagship species on the fish shop and on our plates, yet it is a species whose stocks are in increasingly poor condition. And few French consumers are aware of this.
- “Lack of concrete State involvement through information and obligation measures”. The preservation of marine resources does not appear to be a priority for the State, and regulations are not restrictive enough to prevent overfishing. However, according to some workshop participants, the state is an essential pillar. Without legislation to regulate and impose measures, the situation will not change.

⇨ This stage of comparing the different barriers is essential for the rest of the project. It enables us to identify which barriers to prioritize and which will have the greatest impact.

Greece

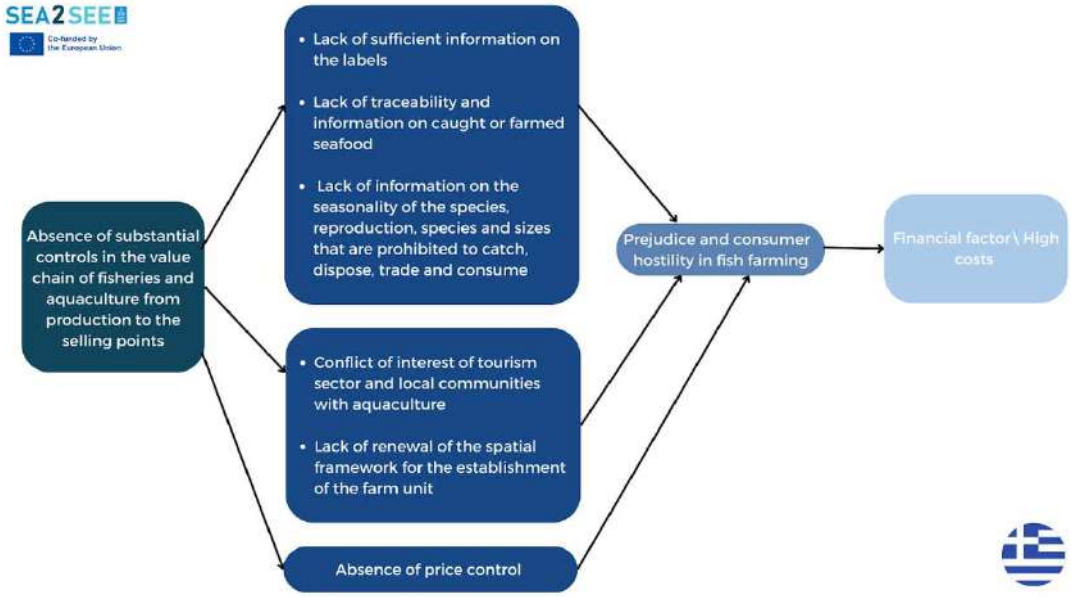


Figure 18. Structural map of Barriers generated in Greece.

The ISM software generated the graph shown in Figure 18, which drew the participants' interest as it matched their opinion of the problems for the consumers' difficulties towards purchasing and consuming sustainable seafood products.

Moreover, they understood how their voting was visualised and were impressed by the software. The facilitator explained the rationale of the graph, meaning that it is read from left to right, with the barriers on the left having the most aggravation. During the meeting, an exciting, vivid conversation was raised on the significance of some of the barriers and their relative gravity, such as prejudice towards aquaculture, which is a common problem and situation faced by the sector in Greece, especially considering the importance of tourism and the conflict of interests with local communities and consumer groups in general. A large part of the discussion was about the lack of a stable, spatial solid framework for establishing aquaculture farms, significantly affecting the opinion formed by the general public.

There seems to be a strong correlation between the existence of an organised spatial framework for the establishment of aquaculture farms and the creation of synergies with other sectors in the coastal zone, such as tourism, and this, in the end, has an impact on the public's experiences about the industry, therefore affecting their opinions. Fishing communities also have much to gain from these synergies, as fishing tourism is an activity with significant potential in Greece. However, fishermen are a particular group with distinct characteristics. Regarding the information on the product label, the aquaculture industry representatives emphasised that the product leaves the facility with a complete label per the strict quality standards that are mandatory to export their product.

However, due to the complexity of the value chain and the many intermediaries, this information ultimately does not reach the consumer in its entirety (or at all), contributing to the uncertainty with which the industry faces, and certain prejudices developed by the public.

Portugal

After creating the first version of the structural map, the group did not fully agree with the location of every barrier. The barriers considered out of place (barrier 3.1 Prejudice about aquaculture products, and barrier 4.1. Literacy on sustainable seafood and fish consumption) were removed and reintroduced one at a time, leading to two new series of relational questions formulated by the ISM Software (one series for each removed and reintroduced barrier). After the restructuring process, it was possible to achieve a map that met the group's expectations, and everyone agreed that the represented relations between barriers were logical (Figure 19).

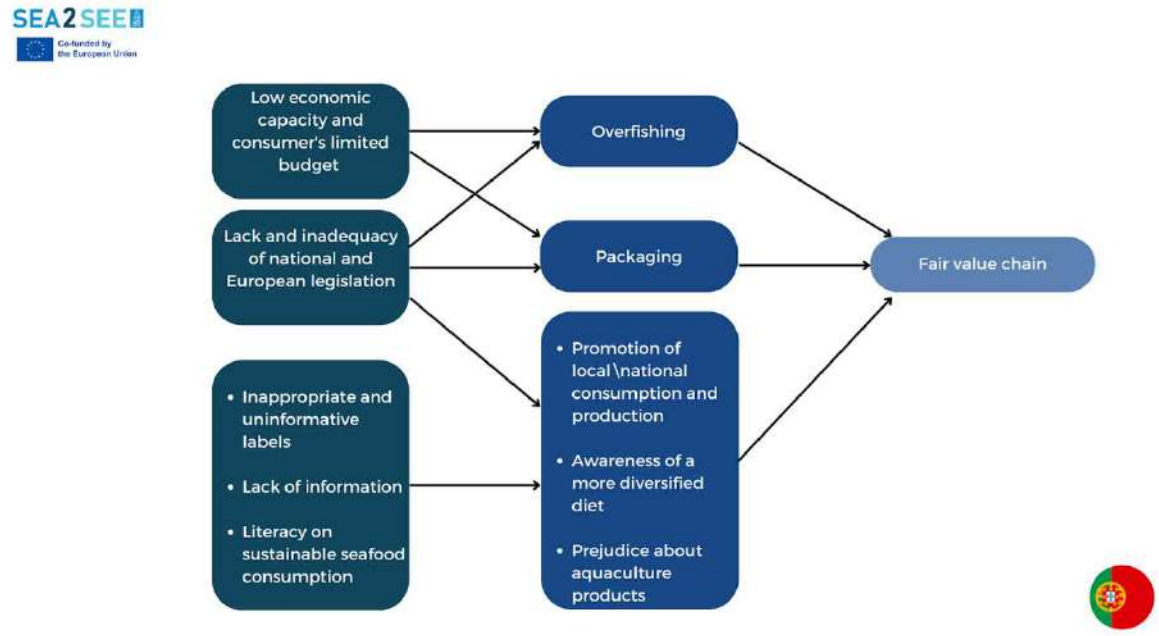


Figure 19. Structural map of Barriers generated in Portugal.

The barrier map that resulted from the structuring process suggests that there are several important barriers hindering the responsible consumption of seafood. Some of which are correlated, consequently, are placed in the same box as "Inappropriate and uninformative labels", "Lack of information" and "Literacy on sustainable fish consumption". The remaining barriers are on the same level of importance and relevance but isolated from one another since they do not resemble this group, they are: "Low economic capacity and consumer's limited budget" and "Lack and inadequacy of national and European legislation".

On the second level of importance, barriers related to "Overfishing" and "Packaging" are influenced by the same barriers: "Low economic capacity and consumer's limited budget" and "Lack and inadequacy of national and European legislation". Several barriers were grouped in the same box - "Promotion of local/national consumption and production", "Awareness of a more

diversified diet" and "Prejudice about aquaculture products" - and all of these are aggravated by the set of barriers from the previous level giving the idea that all of them are, in some way connected to each other.

All barriers identified and displayed on this map will help, directly and indirectly, to resolve the issue of "Fair value chain", a socio-economic aspect that stakeholders have identified as crucial to its resolution. Despite the most voted barrier being "Literacy on sustainable fish consumption", this was placed as one of the least complicated to mitigate and one that would facilitate resolution of other barriers, further emphasizing the need to invest in this area. Overall, the barrier structuring and map generating went well and resulted in a suitable and consistent final result. This was possible because the meaning of each barrier was previously explained to the participants, and collectively discussed one by one. This phase was crucial for the positive development of the workshop and allowed for positive collective work".

Spain

The process of barrier structuring was a core element of the workshop, with many interesting discussions arising from voting "yes" or "no" to the question proposed by the ISM software.

The first structural map did not adequately meet the expectations of stakeholders. The barrier, "lack of official communication to counter fake news and misconceptions", was considered to be in the wrong positioning.

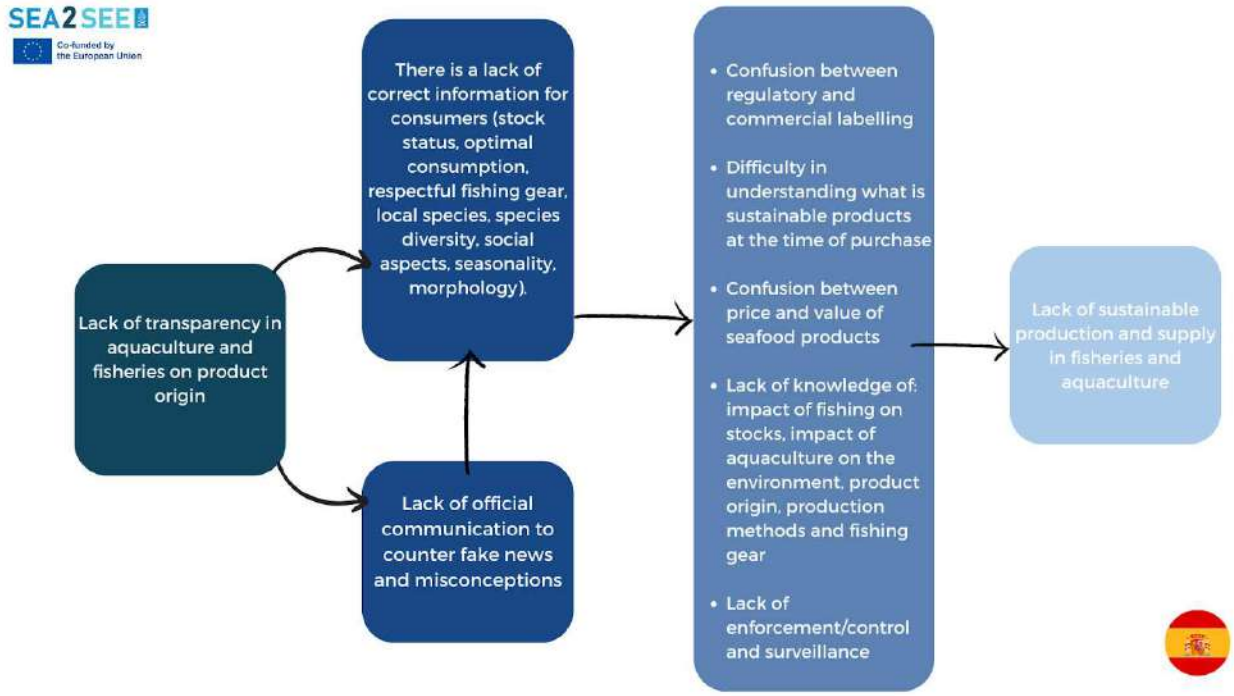


Figure 20. Structural map of Barriers generated in Spain.

Therefore, participants decided to vote again, and the structural map below was generated:

The map of barriers resulting from the structuring process (Figure 20) suggests that the lack of transparency in aquaculture and fisheries - especially regarding product origin- is the most important barrier to responsible consumption.

It follows that the lack of proper communication towards consumers concerning a set of elements - such as the stock status, suggestions about optimal consumption, impacts of fishing gears, local species, diversification of species, social aspects, seasonality, and morphological aspects, hinders the responsible consumption of seafood.

The lack of proper communication is also aggravated by the lack of official channels to counter fake news about the seafood and aquaculture sectors and common misconceptions about seafood.

Several barriers are found in the same box, meaning they feed and aggravate each other: the lack of consumer knowledge and awareness on several aspects of seafood generates confusion between regulatory and commercial labelling, thus deepening the difficulty in understanding what sustainable seafood products are at the time of purchase. Another interesting reflection is the need for clarification and the mismatch between the price and value of seafood products. There is a general perception that sustainability goes hand in hand with higher prices, which sometimes does not get along with the actual value of species. On top of that, the lack of surveillance and control at the production sites and fishing sites hamper transparent communication towards consumers on sustainable practices, thus reinforcing the other existing barriers.

The barriers identified at the left side of the map generate dynamics that make the moment of purchase and choice by consumers even more complex. Eco-labelling has taken hold of the market, and for consumers, it is difficult to understand which labelling to look at when purchasing, in which the absence of standardisation results in further confusion and lack of trust regarding consumers' choices.

A lack of proper communication and information on the side of retailers, such as supermarkets, fishmongers and selling points, worsens consumers' lack of knowledge about seafood products, fishing, and aquaculture practices and generally about which products are sustainable or not.

All in all, given that the consumers have the power to drive the market dynamics and, therefore, the production, a lack of seafood-literate consumers might decrease the demand for sustainable production in fisheries and aquaculture, which is the barrier found as the least aggravating factor.

Interestingly, one of the most voted barriers - the morphology of the fish - was not represented in the structural map, probably because it does not have any aggravating relationship with the other identified barriers. However, participants suggested that this significant barrier should receive proper attention when finding solutions to promote consumption and product acceptance. The morphology of the fish is a primary barrier for consumption and manipulation

in school canteens/restaurants and for the younger generation. An example of a solution to this challenge is the experience of the UK, where fish is not sold as a whole in selling points, or, in Spain, some supermarkets offer the service of preparing fish meals for customers. Customers can choose their desired seafood product to be cooked.

Discussion of the outcomes

Even though each country generated a different structural map, there are some similarities in the pattern of barriers.

For instance, the lack of education and seafood literacy is a highly aggravating barrier in all countries, and the lack of transparency and traceability system throughout the sea value chain was identified as an essential obstacle. Furthermore, the absence of accurate information accessible to consumers and inadequate labelling poses significant challenges to responsible consumption and product acceptance.

Labelling came up repeatedly, and developing a single solution that works for everyone is challenging, making it one of the most difficult topics discussed.

People may need more support and involvement from Authorities regarding legislation for sustainable production and responsible seafood consumption. Additionally, better communication strategies must be used to persuade consumers to change how they view seafood resources.

Many people find it challenging to differentiate between seafood prices because they need a clear and concise explanation. This confusion makes it hard for individuals to discern seafood's value, quality, and sustainability.

5.1.6 SOLUTIONS

The group participants developed solutions for each category of barriers during the final stages of the workshops.

Within the WP2, many solutions will be considered for developing engagement strategies within the SEA2SEE project, especially those addressing consumers and stakeholders of the last part of the value chain.

Some others, which are out of the WP2 and the SEA2SEE project scope, will still be reported to the competent Authorities, such as measures to improve enforcement and compliance with legislation, and economic optimisation of the seafood market. The diverse stakeholder groups attending the workshops could consider solutions in their daily decision-making.

The following section presents a sample of solutions generated by the stakeholders participating in the 1-day workshop in France, Greece, Portugal, and Spain. For the comprehensive lists of solutions discussed in each workshop, please refer to the workshop report in the Annex 9.3.

Based on conversations with stakeholders, it is evident that the primary obstacles to responsible consumption and product acceptance are consumers' lack of awareness, education, and understanding of seafood.

To address this challenge, participants worked on proposals in different countries:

1. Develop marketing and communication campaigns: advertising (digital media), food tasting and gastronomic events, ambassadors' network in points of sale (hypermarkets, supermarkets, restaurants, etc.), technology/information (blockchain apps);
2. Implement large-scale national awareness campaigns to promote consumers' consciousness of seafood values, sustainability, and prices.
3. Create/enhance the educational offer about seafood literacy for elementary and high schools and academia. An example could be summer camps with trips to fish farming plants, fishing vessels, and selling points to bridge the gap between production and consumption.
4. Dissemination of receipts and tutorials on manipulating and cooking seafood products, with particular attention to lesser-known species, to diversify consumers' choices.
5. Set up communication campaigns in supermarkets and on social networks and raise awareness among children from primary school onwards.
6. Propose training programmes about Ocean Literacy and seafood sustainability for stakeholders along the seafood value chain.
7. Implement communication campaigns to give visibility to fisheries and aquaculture to ensure a better understanding of the work and the labour value.
8. Implement actions to raise awareness about the price of seafood products to ensure that consumers will give the correct price value to what they buy.
9. Promote positive messaging about sustainable fisheries and aquaculture to eradicate misconceptions and counteract fake news.
10. Promote the presence of informative posters at the point of sale.

Another relevant category identified by the stakeholders is the difficulty in accessing proper information by consumers, aggravated by the lack of information available on labels and selling points about seafood products. To overcome this issue, the groups discussed the following solutions:

1. Develop actions to bridge the gap between producers and consumers.
2. The information should be easily accessible and conveyed. Additionally, it's crucial to adapt the information to various sales channels to enhance communication with consumers, maintaining consistency in the information provided from credible sources.
3. Different communication formats should be used to adapt the information to the needs and expectations of consumers.

4. IT support can improve consumer communication outlets, complementing flyers and other formats at points of sale.
5. Implement policies about the delivery of information on seafood product labels and promote consistency throughout Europe.
6. Develop more applications and tools to help consumers make informed decisions.
7. Create explanatory QR Codes to display on shelves at selling points.
8. Standardise information included in eco-labels.

6. STAKEHOLDER ENGAGEMENT: ACTION PLAN & TOOLS

6.1 INTRODUCTION

In a world where consumer choices can significantly impact the environment and global food systems, fostering sustainable practices and responsible consumption is paramount. The seafood industry faces unique challenges in this context due to overfishing, habitat destruction, and seafood fraud. Traceability tools that use technology throughout the seafood supply chain can build consumer trust and promote sustainability (OECD, 2008[4]).

To increase product acceptance, an effective engagement strategy must empower seafood consumers, giving more visibility to best practices, making informed choices, and supporting sustainable fishery and aquaculture, contributing to the long-term health of oceans.

The leading purpose of this engagement strategy is to provide seafood consumers with the necessary knowledge, tools, and incentives to become advocates for responsible seafood consumption while gaining their trust and seafood products acceptance. By fostering a deeper understanding of the seafood industry's environmental, social, and economic aspects, consumers can play a vital role in driving positive change and ensuring the viability of our oceans' resources for future generations.

This strategy aims to create a comprehensive framework that combines education, awareness-building, and collaborative initiatives to engage seafood consumers and other relevant stakeholders in the last part of the seafood value chain. This strategy builds upon the results of the Collective Intelligence process undertaken in the different project countries (see Chapter 5). It also recognizes the significance of partnerships among stakeholders, including seafood producers, retailers, conservation organisations, and governmental bodies, to effectively implement and scale up these efforts. By working together, the SEA2SEE consortium can create a more sustainable seafood system that balances environmental preservation, economic viability, and social responsibility.

[4] https://www.oecd.org/greengrowth/40317373.pdf

6.2 GOALS AND OBJECTIVES OF THE CONSUMER ENGAGEMENT STRATEGY

To meet the objectives of the engagement, a strategy has been developed, considering the project's multi-layered context, the outcomes of the bibliographic research and integrating the results of the Collective Intelligence process that provided barriers to sustainable seafood consumption and product acceptance in Europe.

Once again, it is worth mentioning that the engagement activities in WP2 will focus primarily on seafood consumers. Still, they will also target other relevant stakeholders of the last part of the value chain, as identified in the section. 4.2.

The engagement strategy has different objectives, that are summarized in Figure 21:

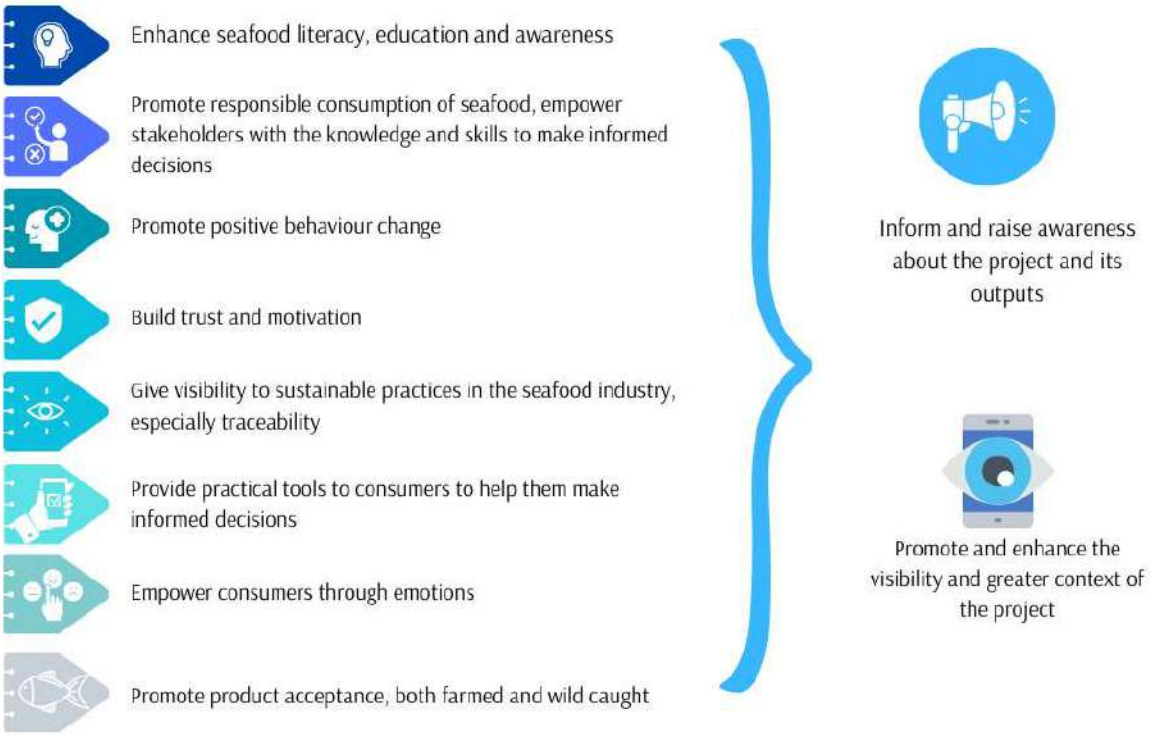


Figure 21. Objectives of the consumer engagement strategy of SEA2SEE

6.3 SWOT ANALYSIS OF STAKEHOLDER (CONSUMERS) ENGAGEMENT STRATEGY

The SWOT analysis is a vital tool for any engagement plan as it provides valuable insights into the current status of the SEA2SEE project and the factors that can impact its success or failure in terms of engagement. By conducting this analysis, we have thoroughly examined the project's weaknesses, strengths, threats, and opportunities in terms of stakeholder engagement, thereby enabling us to establish clear objectives and select the most appropriate engagement channels.

In the case of the SEA2SEE project, conducting a comprehensive SWOT analysis takes on particular significance. It allows us to identify the key challenges and capitalise on the opportunities. The SWOT analysis feeds the stakeholder (consumers) engagement strategy serving as a roadmap for implementing actions and activities until the end of the project. Therefore, this analysis serves as a crucial initial step towards ensuring the success of our engagement plan, guiding our efforts in the right direction (Figure 22).

STRENGHTS

Clear and compelling objectives

The SEA2SEE project's engagement strategy effectively connects with a broad audience, increasing awareness about responsible seafood consumption. Our analysis identified that consumers desire a transparent and trustworthy seafood industry, so offering solutions will make stakeholders more inclined to collaborate and be empowered to achieve the goals.

Technology for consumer's engagement

The SEA2SEE project has indeed a strong technological component, not just in terms of final products but also as a channel of communication and engagement of stakeholders (e.g., online MOOC, online Hackathon etc.).
Society is gaining trust in technology to provide solutions to the big challenges we are facing in the XXI century, and it is more used to be contacted and engaged through virtual channels. Coupled with captivating content, SEA2SEE engagement formats will include online and offline tools and opportunities, which meet a variety of consumer needs and expectations.

Multidisciplinary approach

The diversity of perspectives enables engagement efforts along the entire seafood value chain and facilitates collaboration and knowledge exchange with stakeholders from different sectors, including environmental, scientific, social, and economic fields. This fact broadens the potential audience for engagement efforts and opens collaboration and knowledge exchange opportunities with diverse stakeholders.

Collaboration among stakeholders

Engaging various stakeholders, including seafood producers, distributors, retailers, and consumers, can foster collaboration and create a network of partners involved in sustainable seafood. This collaboration can lead to shared knowledge, resources, best practices, and co-creation processes.

Co-creation approach

As part of the engagement process of the project, different activities are based on co-creation methodologies, actively involving stakeholders, such as consumers, in the creation and development of ideas, products, or solutions. By including stakeholders in the decision-making process, co-creation methodologies promote a sense of ownership and empowerment, leading to higher levels of engagement and commitment.

WEAKNESSES

Seafood sustainability as a complex, and multi-layered concept

There is no universal agreement on the definition of sustainability in the seafood industry. This reflects the confusion consumers have when buying seafood at the selling points. Sometimes ecolabels, which should guide consumers, tend to further confuse them, resulting in mistrusts in seafood products. The SEA2SEE project acknowledges the multi-layered concept of sustainability and tries to integrate this component into its outcomes and actions.

Blockchain as a complex concept for consumers

Blockchain system, although becoming very popular, is a complex and very technical element of the SEA2SEE project. The use of technical words to explain such a difficult concept could hamper the success of the engagement, especially of the general public and consumers.

Complexity of policies that regulates fishing/aquaculture and the seafood industry

The complexity of seafood industry policies presents challenges in engaging consumers for responsible consumption. Various governmental bodies regulate fishing, aquaculture, labelling, import/export, and sustainability. These policies can be overwhelming, with legal jargon and conflicting objectives across regions, leading to confusion. Consumers may struggle to connect their choices with environmental and social consequences, reducing motivation to change consumption behaviour.

Time required to generate results and outputs

The delayed results and outputs hinder timely stakeholder engagement, such as with the long process of building a blockchain system. However, the consumer engagement strategy won't heavily rely on the blockchain, mitigating the impact on overall success.

OPPORTUNITIES

Importance of seafood in the diet

Seafood's nutritional value and role in a balanced diet are widely recognized. Engaging consumers through educational campaigns on responsible sourcing and supporting sustainable seafood empowers them to make positive environmental choices.

Diversity of seafood options

Seafood offers a wide range of culinary possibilities. From fish and shellfish to crustaceans, molluscs and algae, there is a vast array of flavours, textures, and cooking techniques to explore.

Growing demand for sustainable products

We are now at a turning point in terms of society's interest in ocean-related topics. Capitalising on international occurrences, such as the UN Ocean Decade, the EU Biodiversity Strategy, COP15 Agenda, SEA2SEE project will find fertile ground for engagement activities for the general public. There is an increasing trend among consumers to seek sustainable and ethically sourced products, including seafood.

Networking opportunities

SEA2SEE Consortium will seek for collaboration of NGOs, entities, and individuals for the delivery of the engagement strategy, thus establishing new collaborations and promoting co-creation of engagement opportunities. Joining forces with entities and individuals that already foster responsible seafood consumption through traceability solutions, will help reiterate the SEA2SEE messages and objectives, reinforcing and making them more effective and consistent for the consumers.

Innovation for engaging seafood consumers

SEA2SEE project's diverse engagement formats like Hackathons, MOOCs, recipe books, videos, and workshops offer an excellent opportunity for responsible seafood consumption and product acceptance. Novel and creative approaches capture consumers' attention, generating curiosity and paving the way for discussions on responsible consumption.

THREATS

Engagement fatigue and competition with other similar projects

Engagement fatigue occurs when individuals feel overwhelmed or disinterested due to constant information and campaigns. SEA2SEE's engagement strategy aims to promote responsible seafood consumption, but if consumers already experience fatigue, it may hinder effective communication. Competition with other projects can add confusion and repetition, making consumers apathetic and reducing overall effectiveness for the stakeholder engagement.

Lack of seafood literacy and consumer education

Lack of seafood literacy, and more generally of ocean literacy can lead to the misconceptions and scepticism around the seafood industry. Widespread scepticism can lead consumers to avoid seafood altogether, or increase non-responsible practices, and not listen to sustainable narratives, rather than seeking out sustainable options and trust traced seafood products. Preconceived notions about certain fish species and seafood's prestige can also influence consumer choices. Misinformation on safety and quality may also discourage the engagement, along with ethical concerns of aquaculture and fisheries.

Opposition from stakeholders

Stakeholders, including industry representatives and influencers, can affect consumer preferences through marketing and endorsements. If they oppose responsible seafood practices, they may promote unsustainable options, reinforcing harmful choices. This situation poses a barrier to consumer engagement in responsible seafood consumption. Additionally, vegan, or vegetarian activists may oppose SEA2SEE's narrative, boycotting engagement activities and causing conflicts.

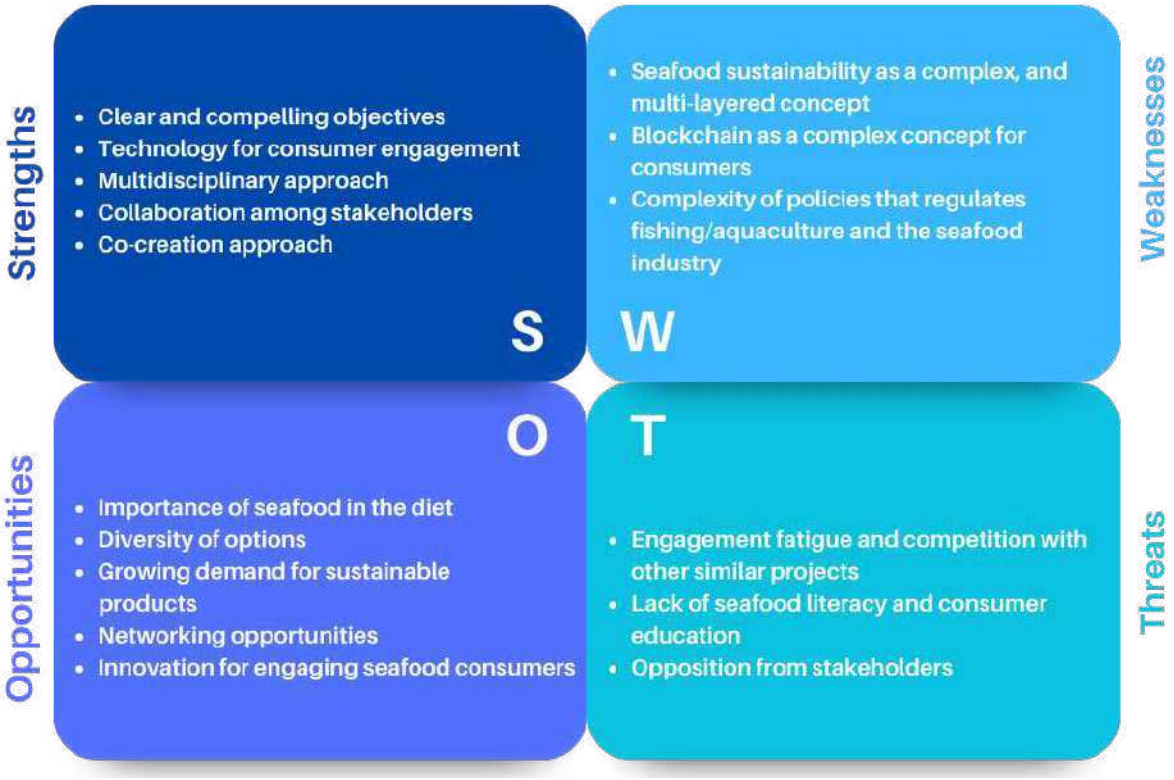


Figure 22. SWOT analysis for the consumer engagement strategy.

6.4 CAME ANALYSIS OF STAKEHOLDER (CONSUMERS) ENGAGEMENT STRATEGY

The CAME analysis (Figure 23) provides a comprehensive framework for addressing the challenges and opportunities within the framework of the WP2, focusing on the consumers' perspectives on the seafood industry. In correcting weaknesses (C), the strategy looks to empower consumers through education and clear communication by breaking down complex concepts and organising workshops; the project seeks to prepare consumers with the knowledge to make informed decisions, ultimately driving positive change in seafood consumption. To adapt or/and adjust to potential threats (A), a multi-faceted engagement strategy is proposed, in which collaboration, and assertive communication, are essential factors to avoid engagement fatigue, dispelling misconceptions, and establishing lasting habits of responsible seafood consumption. Finally, maintaining strengths (M) and exploiting opportunities (E) are the critical challenges through emotional connections, reinforcing reliable consumption narratives, and creating a sense of community, to drive engagement and appreciation for sustainable seafood choices.

CORRECT THE WEAKNESSES - C.
To overcome the detected weaknesses, some of the actions that are planned and will contribute to these barriers are:

- Develop clear and accessible educational but engaging resources, leveraging the popularity of technology, sustainability, and policies in the seafood industry. Consumers will be capacitated, educated, and empowered about the advantages of these approaches, such as enhanced transparency, product authenticity, and support for sustainable fishing practices, through actions like the SEA2SEE MOOC and other channels to empower consumers in making informed decisions.
- Break down the complex concepts into simple, easily digestible information. Use clear and concise language to communicate the key points of seafood sustainability, technologies and policies.
- Collaborate with retailers, restaurants, and influential figures to prioritise sustainable options.
- Involve renowned chefs and influencers to endorse responsible seafood consumption.
- Organise workshops and events to enhance capacity building, targeting consumers and educating about responsible choices.
- Highlight success stories to inspire positive contributions to responsible seafood consumption, keeping stakeholders engaged while longer-term results are generated.
- Identifying and implementing strategies that can deliver immediate results or improvements can be seen as quick wins, which help build momentum, demonstrate the project progress, and keep stakeholders engaged while longer-term results are being developed.

ADAPT TO\ ADJUST TO THREATS- A

To address engagement challenges, we will put into action the following strategies:

- The engagement strategy will prioritise collaboration over competition, working with organisations and initiatives to create a unified message and pool resources.
- Tailoring messages to specific consumer segments will increase relevance, and clear, consistent communication minimises confusion.
- Different engagement channels, including social media, online platforms, events, partnerships, and partners' communication channels, will cater to various communication preferences.
- A long-term focus will combat engagement fatigue, fostering lasting habits in responsible seafood consumption and avoiding high energy investment on short-term campaigns.
- The SEA2SEE project will create a positive message to dispel misconceptions through various formats such as educational videos, MOOCs, recipe books, visiting harbours and conducting workshops with restaurants to increase consumer awareness and foster trust.
- Develop positive relationships with stakeholders based on trust, respect, and mutual understanding to establish a foundation of support and cooperation for engagement success.
- Continuously monitor the progress and outcomes of our initiatives and engage stakeholders in the evaluation process through the collection of feedback.

- Conduct awareness campaigns and educational workshops to address misconceptions and increase their understanding of the context to help them make informed decisions. Feedback on education and engagement activities will also be crucial to reinforce their importance and involvement in the process, building trust and reducing opposition.

MAINTAIN THE STRENGHTS- M

- Clear objectives provide purpose and direction for the engagement strategy. With clear objective and persuasive communications, we will create emotional connections to motivate consumers to adopt sustainable seafood choices and advocate for responsible practices.
- SEA2SEE's technology offers a transparent system tracking seafood from catch to plate, building trust and enabling informed choices for responsible consumption improved by providing an interactive platform that could educate consumers and inspire behavioural changes through engaging learning experiences.
- SEA2SEE utilises a multidisciplinary approach, leveraging partners' expertise to create engaging experiences meeting stakeholder needs. This context facilitates multi-stakeholder dialogue, complementing the engagement activities planned in WP2 and those in WP1 for comprehensive engagement along the seafood value chain.
- Through partnerships with various new and existing stakeholders, the SEA2SEE project aims to expand its engagement efforts and increase its impact.
- By involving consumers, SEA2SEE taps into their insights, preferences, and concerns, empowering them through a co-creation approach. The Collective Intelligence process revealed barriers and paved the way for targeted actions. The upcoming Hackathon will create a complementary blockchain-based tool for informed decisions.

EXPLORE THE OPPORTUNITIES- E

- SEA2SEE can showcase the versatility and excitement of seafood products by engaging consumers through cooking demos, recipe sharing, and food festivals. Sharing the cultural significance and regional heritage of culinary traditions can foster pride in supporting seafood as part of a healthy diet. This emotional connection can motivate consumer engagement and appreciation for seafood.
- SEA2SEE capitalises on the opportunity to use blockchain technology for traceability, enhancing the appeal of sustainable seafood to consumers. Through traceability solutions, the project empowers citizens in the narrative of responsible seafood consumption, reinforced by diverse engagement formats.
- Leveraging new channels enables personalised content delivery, making responsible consumption relatable and relevant. Tailored messages through diverse communication channels can increase consumer engagement and behaviour change. Also, integrating social sharing fosters a sense of community and amplifies the impact of responsible consumption messaging.

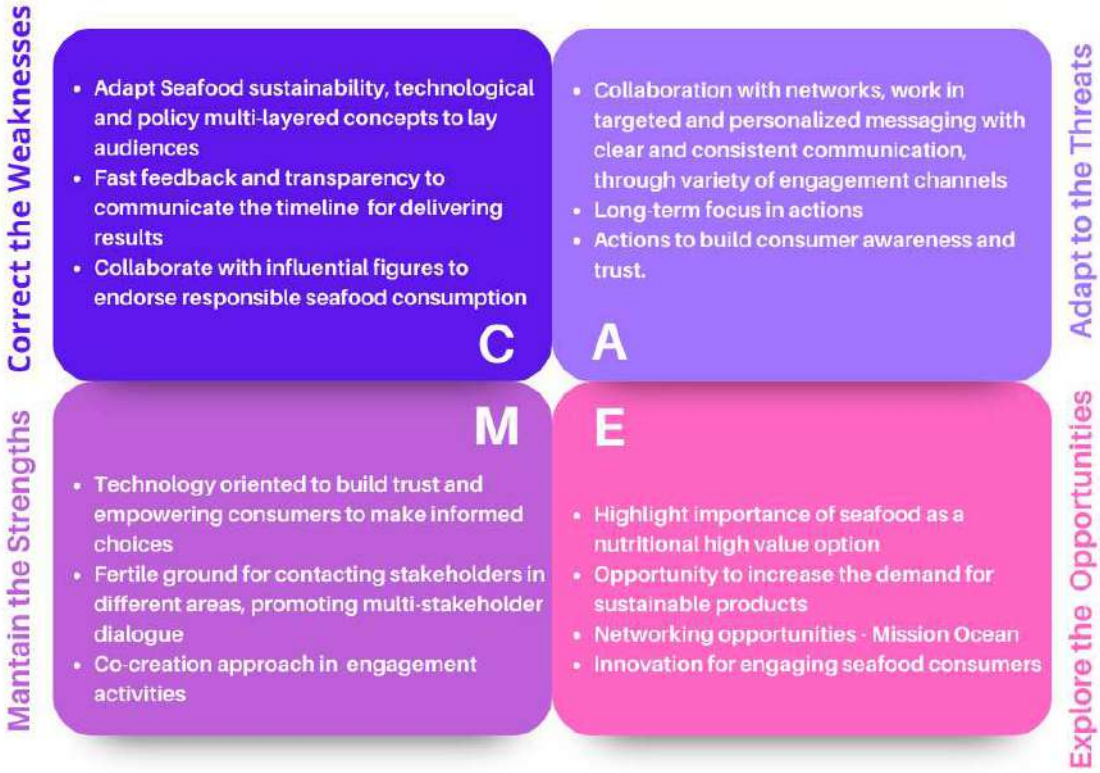


Figure 23. CAME analysis for the consumer engagement strategy.

6.5 WIN-WIN STRATEGIES FOR CONSUMER ENGAGEMENT

Following the results from the one-day multistakeholder workshop, and the SWOT and CAME analysis, we came across four pillars for the engagement actions (
Figure 24), to achieve successful consumer engagement in responsible seafood consumption in Europe.

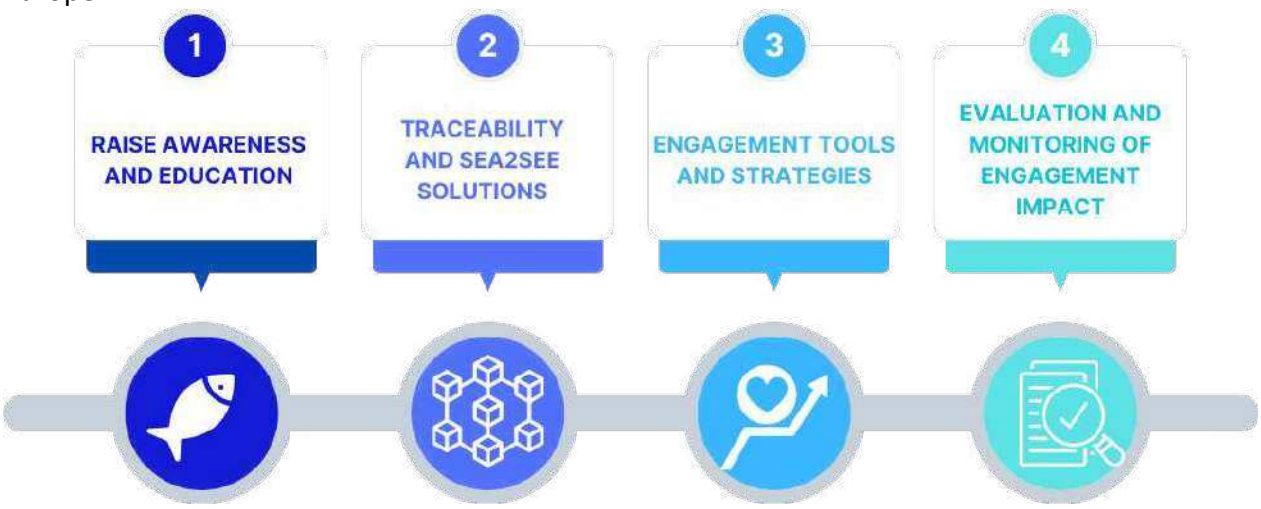


Figure 24. Roadmap for consumer engagement within the SEA2SEE project.

1) Raise Awareness and Education:

- Work with NGOs, government agencies, HoReCa representatives, food influencers and seafood industry experts to create educational campaigns that emphasise the significance of responsible seafood consumption. These campaigns should cover sustainable fishing practices, aquaculture, ecolabelling, environmental impacts, and best practices.
- Encourage educational programs and awareness campaigns in schools, supermarkets, and community centres to educate consumers of all ages about sustainable seafood options and the potential consequences of unsustainable practices.
- Use different channels, including websites, social media, and traditional media, to spread educational materials, guides, toolkits, and resources about responsible seafood consumption, addressing the stakeholders at the end of the seafood value chain.

2) Promote traceability and the SEA2SEE solutions:

- Work with retailers, restaurants, and seafood suppliers to prominently display traceability information on seafood products, providing consumers with clear guidelines about sustainable choices.
- Showcase the benefits of the SEA2SEE traceability system to consumers and engage them in the use of tools for making informed decisions at the time of purchasing.
- Showcase SEA2SEE solutions to promote consumers trust and product acceptance.

3) Engagement tools and strategies:

- Engage consumers directly through awareness campaigns, social media engagement, and events that emphasise the benefits of responsible seafood consumption for the environment and their health. By leveraging these channels, SEA2SEE consortium can collaborate with seafood influencers or run campaigns that highlight sustainable lifestyles, eco-friendly seafood products, and responsible consumption habits, thereby influencing consumer choices and promoting a positive behaviour change.
- Provide accessible and user-friendly platforms, such as mobile apps or websites, that enable consumers to make informed choices by accessing information on sustainable seafood options, recipes, and meal planning.
- Highlight the cultural significance of seafood and appeal to consumer's emotions to promote positive behavioural change and encourage responsible practices.

4) Evaluation and monitoring of engagement impact

- Actively engage with seafood consumers through surveys, feedback mechanisms, and consumer forums. Seek their input on sustainability initiatives, request their ideas, and address their concerns. This engagement helps build a sense of shared responsibility and empowers consumers to make informed choices.
- It is important to underline that stakeholder’s power and interest can change over the duration of the project. This means that the stakeholder engagement approach and tools will be periodically reviewed to match the needs and priorities of the stakeholders.

- Another relevant aspect of the stakeholder strategy is the timing. Relevant stakeholders for the WP2 activities were identified in the early stages of the project. Selection and prioritisation of stakeholders will be done throughout the project duration, depending on the activities to be undertaken (see the following section 6.6).

6.6 ACTIONS WITHIN THE SEA2SEE PROJECT TO ENGAGE CONSUMERS AND INCREASE SEAFOOD LITERACY AND PRODUCT ACCEPTANCE

In this section, we will present a series of activities under Task 2.2 (
Figure 25) to engage consumers and stakeholders identified as critical players in the last part of the seafood value chain. These actions are based on the barriers identified during the Collective Intelligence Workshop (Figure 17 Figure 18Figure 19Figure 20). The identified barriers will serve as a starting point to develop targeted actions that aim to overcome obstacles, promote seafood literacy, increase product acceptance, and meet stakeholders' expectations. The goal is to raise awareness and empower them to make responsible decisions through sensibilization and educational campaigns.

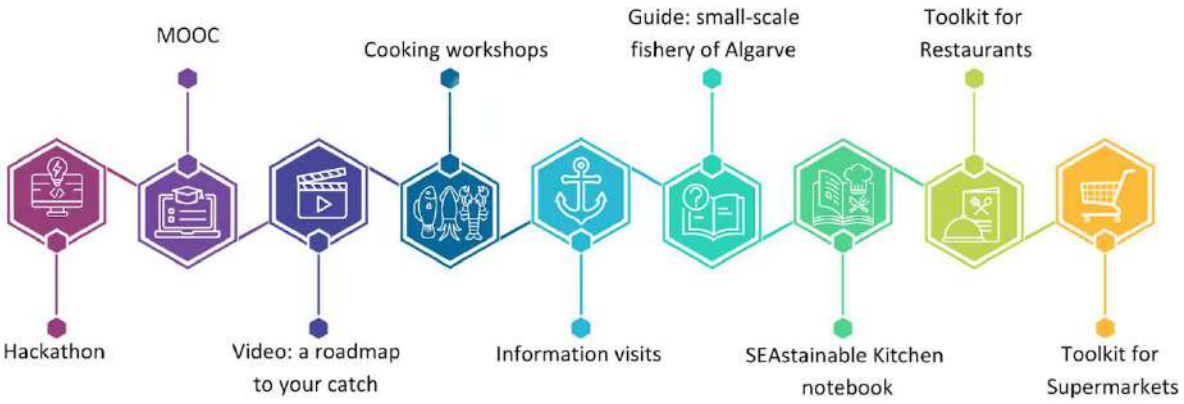


Figure 25. Activities of engagement planned throughout the SEA2SEE project duration.

The following table show which of the stakeholder's groups identified in section 4.2 will be mainly targeted by the actions within WP2 and how they will be involved:

Table 3. Stakeholders involved in the engagement actions of WP2.

Activities	Main Targeted Stakeholders	Engagement Strategy
SEA2SEE Hackathon	• Educational stakeholders • Individuals & consumer segments • Consultancy and advocacy	The Hackathon targets students and professionals with diverse backgrounds, involving them in co-creation. More experienced professionals and university

	organizations or individuals • Networks	professors will mentor the groups and check the participants' progress. The solution will be implemented to support consumers in making informed decisions while buying or consuming seafood.
MOOC	• Educational stakeholders • Individuals & consumers segments • Public Administration & Institutions • HoReCa • Cooking Schools • Consultancy and advocacy organisations or individuals • NGOs • Media • Seafood ambassadors	The MOOC targets various stakeholder groups, with learning modules and content adapted to different audiences. The MOOC's materials cover various topics related to the seafood industry, making it suitable and adaptable for different contexts. The MOOC will contain tips for responsible consumption and content to boost seafood literacy.
Video: a roadmap to your catch	• Educational stakeholders • Individuals & consumers segments	This video will showcase the value chain of the octopus in the Algarve Region, from capture to market, to inform and empower end-consumers. The video will also be suitable for educational contexts.
Cooking workshops	• Individuals and consumers segments • HoReCa • Cooking schools • Seafood ambassadors • Educational stakeholders • NGOs • Media • School Canteens	The workshops will be an opportunity to engage with HoReCa representatives, chefs, and restaurant owners to include sustainable seafood in their menus. The workshops will involve various stakeholder groups to raise awareness of seafood traceability and sustainability.

Information visits	• Individuals and consumers segments • Public Administration & Institutions • HoReCa • Cooking schools • Seafood ambassadors • Educational stakeholders • NGOs • Media • School Canteens	Visits to the harbours will be organised with various stakeholder groups to showcase sustainable seafood products and valorise the regional culinary heritage.
Guide: small scale fisheries of Algarve	• Individuals and consumers segments • HoReCa • Educational stakeholders • NGOs • Seafood ambassadors • Public markets	The educational contents of this booklet will be suitable for consumers and eco-tourists that want to know more about the small-scale fisheries of octopus in the Algarve Region. The SEA2SEE partners and other stakeholders will be involved in producing this booklet to showcase the cultural heritage of this seafood value chain.
SEAstainable Kitchen Notebook	• Individuals and consumers segments • HoReCa • Educational stakeholders • NGOs • Seafood ambassadors • Supermarkets • Public markets • School Canteens • Consultancy and advocacy organisations or individuals • Media	The main objective of this action is to inspire responsible seafood consumption and raise awareness among consumers. The production of this book will be possible thanks to the collaboration among various stakeholders related to the seafood value chain, and its contents will be suitable for different contexts.
Toolkit for Restaurants	• HoReCa	The toolkit will provide resources and guidelines

	• Individuals & consumers segments	designed to help restaurants and other HoReCa representatives make sustainable choices regarding the seafood they serve. Implementing this toolkit will revolutionize the dining experience for end-consumers.
Toolkit for Supermarkets	• Supermarkets • Public Markets • Individuals & consumers segments	This toolkit contains resources for supermarkets and markets to promote responsible seafood sourcing and support sustainable fishing and farming practices while communicating effectively with clients. End-consumers will also benefit from implementing this toolkit, with educational and informative materials supporting their buying experience.

6.6.1 HACKATHON (M12-M18)

After finalising the CI process, as the first consumer engagement action in WP2, we launched the SEA2SEE Hackathon. This initiative is co-organised in partnership with CBCat's BlockchainxODS project. The goal of this program is to encourage the adoption of blockchain technology in real-life projects by promoting a collaborative approach to supporting the Sustainable Development Goals. The Challenge statement came from an internal discussion around the main barriers to responsible consumption and product acceptance identified through the CI process in the project countries.

The SEA2SEE Hackathon will address SDG 14- Life Below Water with the following Challenge:

"Develop a complementary tool based on blockchain technology designed to assist consumers in making informed and responsible decisions when purchasing seafood."

The timeline of the Hackathon is organised as follows (Figure 26):

Figure 26. SEA2SEE Hackathon timeline.

While prioritising barriers, it was detected that the current system lacks tools and resources for consumers to make informed decisions. This Hackathon aims to create a user-friendly and interactive tool that encourages better consumption habits and empowers people to contribute to the solution.

The call was open to students and professionals interested in the topic, and it highly encouraged the formation of multidisciplinary teams to address the Challenge and mentored by the different partners from the SEA2SEE project, CBCat, and also from University Teachers. The Hackathon kicks off in September 2023 with an introductory session in which students will be trained on the blockchain, the SDGs, the SEA2SEE project and the Challenge.

The incubation process will last until November 2023, and the teams will undergo checkpoints with tutors/mentors to track the progress and improve their solutions.

At the end of the process, a jury will select the best solution. Everyone participating in the Challenge will receive a certificate acknowledging their participation. However, during the award ceremony, only the winning team members will be given a Meta Oculus 2, Immersive All-In-One Virtual Reality Headset.

The following scheme (Figure 27) explains in detail the different steps the SEA2SEE Hackathon will undergo, from the definition of the Challenge until the award ceremony:

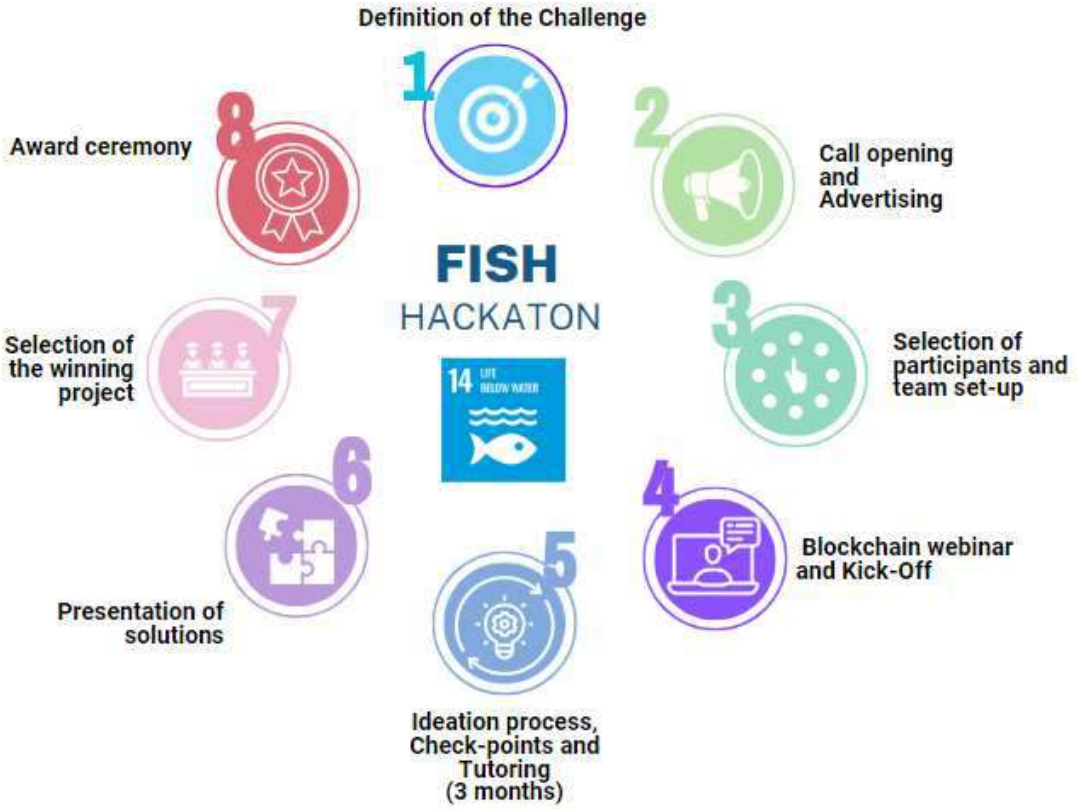


Figure 27. SEA2SEE Hackathon process.

6.6.2 MOOC (M18-M48)

A Massive Open Online Course (MOOC) will be created as part of the project to educate consumers and stakeholders on responsible consumption and sustainable production practices in the seafood industry.

The MOOC will cover various topics, including fish life cycles, fishing methods, aquaculture processes, seafood traceability and guidelines for responsible purchasing and marine conservation. One of the main barriers identified in the Collective Intelligence process was, in fact, a lack of seafood literacy in society, and the MOOC will provide resources to help overcome this obstacle.

The primary audience for the MOOC is consumers and stakeholders in the last part of the seafood value chain, including market owners, fishmongers, chefs, restaurant owners, food bloggers and influencers, and supermarket representatives. It also targets educators and teachers, who can use the MOOC resources to complement their classes in schools and other non-formal educational contexts.

The course will use recorded presentations and video capsules to deliver the content, with additional support materials like summaries, infographics, and animated videos also available.

The primary language for presentations and materials will be English, but subtitles and summary materials will be translated at least into Portuguese, Spanish, French, and Greek.
The course will be offered in four editions, each lasting two months, and updated based on teacher and student feedback. Between each edition, the educational materials will be revised and updated as necessary according to teachers' and students' comments and suggestions.

6.6.3 A ROADMAP OF YOUR CATCH (M24-M48)

"*A Roadmap of your catch*" video from capture to market (including, e.g., information about the vessel/fisher/gear which captured the product) based on the case study of the Algarve octopus fishery.in English and Portuguese.

6.6.4 STAKEHOLDER COOKING WORKSHOPS (M24-M48)

Four workshops will be held in Catalonia and France to encourage chefs to include sustainable seafood in their menus. The awareness activity will count on the support of "chef ambassadors" in each country.
Actions will also target cooking school students to raise awareness of seafood traceability and sustainability in the future generation of chefs and restaurant owners.
Activities will include cooking and tasting sessions with fish farmers, fishermen and blind tests with less known fish, wild and farmed fish.

6.6.5 INFORMATION VISITS WITH STAKEHOLDERS (M24-M48)

Visits to the harbours will be organised in Spain, Portugal, and France, with various stakeholder groups (e.g., consumers, restaurant owners and chefs, media, supermarket owners etc.) to showcase sustainable seafood products. These activities aim at valorising the regional seafood culinary heritage, bridging the gap between fishers and end consumers, and showcasing sustainable practices.

6.6.6 SMALL-SCALE FISHERIES OF ALGARVE GUIDE (M24-M48)

The production of a "guide to the Algarve traditional small-scale fishery" focused on the Algarve octopus fishery and its cultural heritage in the format of a booklet, targeting consumers and eco-tourists, including a map of what to visit and information about sustainable consumption, socioeconomic importance of the fishery and cultural heritage.

6.6.7 THE SEASTAINABLE KITCHEN (M24-M48)

The notebook "SEAstainable Kitchen: A Culinary Journey Towards Responsible Seafood Consumption" will be a culinary guide that blends delectable recipes and captivating food heritage to inspire responsible seafood consumption. This notebook will be a culinary guide that combines delicious recipes and fascinating food heritage to encourage responsible seafood consumption, drawing upon the importance of sustainable practices and ocean conservation. Resources like this one serve as a powerful tool to raise awareness about the impact of our food choices on the environment and marine ecosystems.

Each chapter showcases a cuisine that reflects the local cultural identity, traditional fishing practices, and unique seafood dishes related to the pilot sites, providing practical tips and guidelines for making environmentally conscious choices when purchasing seafood and empowering readers to make informed decisions when shopping for ingredients. Additionally, insights from marine biologists and ocean conservationists (video pills) underscore the importance of safeguarding the marine ecosystem for future generations. The online notebook will be produced in English, French, Spanish, Portuguese and Greek, drawing upon the importance of sustainable practices and ocean conservation.

6.6.8 TOOLKIT FOR RESTAURANTS (M24-M48)

The toolkit will contain comprehensive resources and guidelines to help restaurants make sustainable choices regarding the seafood they serve. It aims to educate restaurant owners, chefs, and staff on the importance of sustainable seafood practices. It provides practical strategies for sourcing, preparing, and promoting seafood in an environmentally responsible manner. The toolkit will include educational materials, sourcing guidelines, suggestions for creating seafood menus that focus on sustainable options and seasonal recommendations. It will also have guidelines for effectively communicating a restaurant's commitment to responsible seafood choices to customers.

Also, examples of other restaurants or businesses that have successfully implemented sustainable seafood practices and experienced positive outcomes will be featured. These success stories can serve as inspiration and demonstrate the benefits of responsible seafood consumption.

Furthermore, local restaurant interventions will be planned: for example, in Portugal, personalised table sets will be created, with QR codes to check information about the origin of products.

6.6.9 TOOLKIT FOR SUPERMARKETS (M24-M48)

This toolkit aims to promote responsible buying of seafood and support sustainable fishing practices within the supermarket industry. This toolkit empowers supermarkets to make informed decisions, improve their seafood sourcing, and communicate effectively with their customers about sustainable seafood options by providing practical resources, guidelines, and educational materials.

It will contain seafood sourcing guidelines for supermarkets to emphasise the importance of selecting products from well-managed fisheries and aquaculture operations and give visibility to traceability practices.

The toolkit will present an overview of the seafood certification programs and explain their significance: this will help supermarkets identify certified products and build trust with consumers, knowing that the seafood has been sourced sustainably.

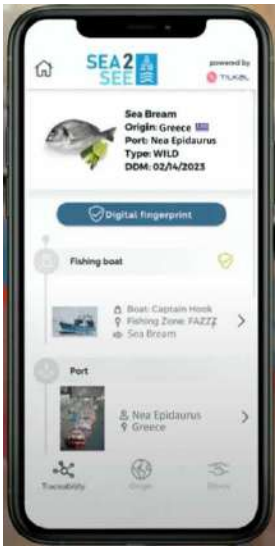
It will also include customizable educational materials (e.g., posters, brochures etc.) to raise consumers' awareness of the importance of sustainable seafood consumption and the positive impact of responsible decisions.

Last, but not least, it will also include some tips for marketing and communication strategies to communicate effectively to consumers about complex topics of the seafood industry through a positive messaging and storytelling approach.

6.7 CONSUMER INTERACTION WITH THE SEA2SEE BLOCKCHAIN-BASED PLATFORM

Spotlight is one of the four modules that make up Tilkal's traceability and transparency platform. It is a web application (digital product passport) that radically transforms the purchasing experience in an environment where client demand for transparency is increasing. The tool allows industrials and brands to interact with their customers through a 100% transparent and dynamic experience. It shows them their favourite product's entire journey: where it comes from and how it was made, based on secured traceability information.

Thanks to a QR code on traced products' packaging, consumers can access proof-based information specific to the product they have in his/her hands. Spotlight provides them with comprehensive and auditable information on sourcing, suppliers, certifications, manufacturing, transportation, storage conditions, impact, etc. The application also includes a section for consumers to rate their transparency experience and share their comments with the manufacturer, opening a brand-new digital communication channel with no equivalent. This tool builds trust and enhances customer engagement by allowing them to make an informed purchasing decision aligned with their values. It drives brand/sector advocacy by contributing to proving its commitments.



Consumer-friendly application, to increase trust and social acceptance of sustainably fished and farmed seafood.

In the SEA2SEE project's context, a transparency web app backed by a secure, auditable data collection system can drive positive change, promoting legal & ethical fishing, environmental

sustainability, food safety, and a social component as worker welfare, building consumers' trust within the European seafood industry. With Spotlight, consumers can make informed choices and support responsible fishing practices while enhancing confidence in the seafood they purchase.

7. COMMUNICATION PLAN FOR CONSUMER ENGAGEMENT

7.1 COMMUNICATION ACTIONS AND TOOLS

The Communication & Dissemination Plan (D.7.2) will serve as a roadmap, containing guidelines on communicating and disseminating the SEA2SEE actions and results to the relevant stakeholders.

Given that the WP2 actions target various stakeholders, especially consumers, we will plan specific communication assets for each event, tool, and activity in captivating formats. With the help of partners involved in the particular engagement action, we will give visibility to its objectives, contents, and opportunities for stakeholders, creating dedicated communication campaigns following the SEA2SEE project communication strategy.

In general, each activity will be featured in the following channels:

- SEA2SEE website: the section "Get Involved" is a dedicated page where stakeholders can find further information and how to participate in activities proposed by the consortium.
- SEA2SEE social media channels (LinkedIn, Instagram, Facebook, Twitter, YouTube) to engage with the community and promote dialogue and interaction. For social media, various formats (videos, stories, feed posts) are envisaged, which will be recognisable using the SEA2SEE brand manual guidelines.
- SEA2SEE Partners social media and websites by reposting news and other communication assets.
- SEA2SEE newsletter, which redirects interested stakeholders to the project website.
- External channels: European Commission website and affiliated channels; Ocean Decade channels
- Other formats: brochure, flyers, video capsules.
- Media coverage: it is expected that the engagement initiatives will receive attention from local online and offline media (Radio, TV, magazines, News etc.) to encourage local realities to take part in the SEA2SEE events and opportunities. When considered appropriate, WP2 actions will be featured in press releases.

The communication assets will always reflect the SEA2SEE project brand manual, and the consortium will approve messaging.

We provide a few examples of communication actions developed in collaboration with WP7 to give visibility about the WP2 activities:

- **SEA2SEE flyer for WP2 stakeholders**

SUBMON created a flyer for consumers to summarise the project information and objectives. This resource is an excellent example of how to simplify the multi-layered complexity of the project to be understandable by the general public. This resource has been used during events and fairs to give visibility to the project. The flyer is included as Annex 9.4.

- **Survey to identify barriers to responsible consumption and product acceptance**

A dedicated communication campaign was developed and coordinated by SUBMON in collaboration with WP7, with the creation of flyers and social media posting, supported by all involved partners (Figure 28).

Figure 28. SEA2SEE communication campaign for the consumer survey to collect barriers to responsible seafood consumption and product acceptance in France, Greece, Portugal and Spain.

SUBMON created an article for the SEA2SEE website section, “How to get involved”, explaining the Collective Intelligence process and inviting users to answer the survey (https://sea2see.eu/get-involved/).

- **Hackathon**

As a first step, SUBMON and CBCat created a flyer (Figure 29) and social media posts to promote the Hackathon. To reach broader participation, SUBMON prepared a whiteboard animated video explaining the registration process in a fun way and shared it through the different digital

channels of the other institutions and partners involved (https://www.youtube.com/watch?v=21tj2YTxhCo).

Also, social media publications were made on SEA2SEE accounts and social posting in relevant groups and other EU channels (e.g., EU in my Region, LinkedIn groups about European Hackathon, etc.

The Hackathon was also featured in the SEA2SEE newsletter, as well as the ECOPs Programme newsletter service, which has more than 2000 subscribers.
Specific contacts with European Universities were made to encourage students to participate in the Challenge.

Figure 29. SEA2SEE Hackathon flyer.

7.2 CORE MESSAGES ADDRESSED TO CONSUMERS

Based on the results of the Collective Intelligence Process and internal conversation with WP2 partners, we have defined examples of messages we want to convey to the stakeholders at the end of the seafood value chain throughout the project duration. The identification of core messages is helpful to:

- Support the stakeholder engagement strategy.
- Clarify which objectives we would like to reach in terms of involvement and empowerment of stakeholders" by the end of the project.
- Set out an efficient communication approach.

- Plan better our engagement actions.

The following section presents a non-exhaustive list of topics and messages that will be explored and used to engage stakeholders to support responsible seafood consumption and increase product acceptance.

TOPICS AND MESSAGES

The seafood industry is a complex web of stakeholders, from producers to consumers, each with unique concerns and interests. Implementing blockchain processes in the seafood industry brings added value by ensuring transparency and traceability throughout the supply chain, enhancing the product's value and market placement. Various questions arise about the benefits and trust-building aspects of embracing the SEA2SEE blockchain system in this context. Additionally, the importance of educating and engaging consumers in understanding the blockchain process and dispelling misconceptions about aquaculture and marine fisheries is essential. By unveiling the complexity of the seafood industry and addressing concerns related to human health and seafood consumption, the strategy aims to empower consumers to make informed and sustainable choices. Here are some examples of how a topic can be approached from different perspectives to ensure a comprehensive approach to communication actions.

- **The added value of the blockchain system in the seafood industry**

Blockchain processes guarantee transparency regarding information about the different steps, from production to consumption. A product traceability system increases its value and helps to place the product in the market.

We reflected on the following questions:

- Why should stakeholders embrace the SEA2SEE blockchain system?
- How do stakeholders benefit from using the SEA2SEE blockchain system for the seafood industry?
- How can we gain stakeholders' trust using the SEA2SEE blockchain system?
- How can seafood consumers understand and valorise the information related to the blockchain process?
- How can the blockchain system make the seafood industry more sustainable?

Messages targeting consumers:

- Understanding the blockchain process would help consumers in trusting the products, as well as encourage them to make informed decisions about the seafood they buy.
- Also, it gives the opportunity to learn more about the complexity of the seafood industry, and perhaps could encourage the consumers to be more willing to pay for quality products.

- Furthermore, buying products from a traceability system could also give consumers the power to think that their individual decisions count in counteracting overfishing and marine environment degradation due to fish consumption, empowering them.
- Blockchain could provide extra information about the seafood products – e.g., environmental, ethical, or social characteristics, production techniques and practices, or nutritional information- that might be beneficial for making informed decisions.

- **Eradicate misconceptions about aquaculture**

Several myths and misconceptions are rooted in society, and together with knowledge gaps, often guide retailers' and consumers' intentions while purchasing seafood.

We discussed how, within our project, we could eradicate the misconceptions around aquaculture and renovate trust in this production method. Examples of generally negative perceptions of aquaculture:

- Aquaculture products are full of antibiotics.
- Farmed fish is not safe to eat.
- Farmed fish have lower nutritional value.
- Farmed seafood is only grown on land and close to shore.
- Aquaculture is inevitably bad for the environment.
- Farming conditions are always poor (dirty water and crowded conditions)
- There is plenty of fish in the ocean. There is no need for farmed fish.
- Fish farms use inhumane methods to keep away predators.
- Many believe farmed fish is less fresh than wild-caught fish.

Messages targeting retailers and consumers:

- The European aquaculture system is one of the safest in the world.
- In Europe, aquaculture production is subject to licencing and monitoring procedures.
- EU countries must comply with strict requirements under EU legislation and national legislation to ensure that aquaculture respects human and animal health and the environment.
- The sustainable development of aquaculture is one of the main objectives of the EU common fisheries policy.
- The technology could help prevent damages related to aquaculture discharges to prevent eutrophication of surrounding areas.
- Social justice in aquaculture is possible, and European policies support improving skills and working conditions in aquaculture sectors.

- **Misconceptions about marine fisheries**

As in aquaculture, numerous myths and misunderstandings prevail about fisheries, leading retailers, and consumers to make uninformed decisions when purchasing seafood.

The SEA2SEE project aims to explain these ideas surrounding marine fisheries with actual data and rebuild trust in this production method, giving individuals the tools to empower them to make well-informed decisions.

Some examples of these misconceptions include a less diverse culture of seafood consumption built around a small number of commonly consumed species. Unfortunately, the consumer's favorites come with substantial concerns regarding sustainable fishing.

Several myths and misconceptions are well spread in society, and together with knowledge gaps, often guide retailers' and consumers' intentions while purchasing seafood. We discussed how, within our project, we could understand the misconceptions around marine fisheries, renovate trust in this production method, and give tools to make informed decisions.

Examples of misconceptions around marine fisheries are:

- Is it better to buy local or from selected areas?
- If the fish is in season, it is sustainable.
- Fish is challenging to cook, and fish preparation requires time and skills.
- All the stocks are overfished.
- Fish is full of mercury and therefore not healthy for human consumption.

Messages targeting retailers and consumers:

- The seasonality of seafood is linked to its availability on the markets (then to the period of fishing). When they reproduce, they gather together and are easier to catch. So, the first sustainability criterion to check is the state of stocks.
- Learning basic information about an organism's life cycle could guide consumers' purchasing decisions.
- It is essential to buy only fish that have reached adult size. Fish caught too young have been unable to reproduce and help renew stocks.
- Diversifying consumption: High demand for certain fish and seafood species can lead to overfishing. In contrast, many lesser-known species are available in ample supply and are sustainable. Consumers should look beyond the usual suspects and try something new, discovering new tastes and recipes. Virtually all fish is delicious and easy to cook.
- Understanding the difference in terms of impact caused by different fishing gears could guide consumers' purchasing decisions.

- Europe policies target fishing sustainability and seafood security, supporting the transition to low-carbon fishing and supplying quality and healthy seafood to European consumers.
- In Europe, marine fisheries are subject to licensing and monitoring procedures.
- EU countries must comply with strict EU and national legislation requirements to ensure that marine fisheries respect human and animal health and the environment.
- Social justice in marine fisheries is possible, and European policies support improving skills and working conditions in this sector.
-

- **Unveiling the complexity of the seafood industry**

The seafood industry is one of the most complex food systems for several reasons, e.g.:

- The EU fishing industry is the fourth largest in the world, providing some 6.4 million tons of fish each year and jobs for more than 350,000 people.
- Lack of transparency, absence of traceability, and perverse incentives that encourage unsustainable fishing practices perpetuate poor fisheries and aquaculture management, whereas illegal, unreported, and unregulated (IUU) fishing are the greatest threats to the sustainable exploitation of fish populations.
- The multi-dimensional relations between fishers, traders, and countries for seafood exchange and other interactions add complexity to the system.
- The innate nature of the seafood product brings complexity in terms of logistics (storage, manipulation, labelling, etc.).
- Labelling of seafood is not always trustworthy.
- Greenwashing in the seafood industry.
- Acknowledging this complexity and communicating it properly to our stakeholders could help gain their trust in our project.

Messages targeting retailers and consumers:

- Consumers wield considerable power over the market in fish and seafood products thanks to their buying power.
- Governments and companies wield responsibility for the production and distribution of sustainable products.
- Tools to read correctly labels on seafood could be helpful at the time of purchasing.
- Beware of greenwashing.
- Shading light on the price and values of seafood products to increase the consumers understanding.

- **Concerns about human health and seafood consumption**

Several studies point out the relationship between human health and seafood consumption, stressing some factors concerning consumers when purchasing seafood. Incorrect beliefs about health risks and knowledge gaps regarding the relationship between human health and seafood consumption often guide buying decisions. Examples of widespread knowledge gaps among consumers are:

- Misinformation about health concerns regarding seafood consumption (e.g., microplastics in fish, mercury bioaccumulation).
- Misinformation about the nutritional values of seafood (fished or farmed).
- Misinformation about processed seafood.
- Misinformation about frozen seafood.

Messages targeting retailers and consumers:

- Filling knowledge gaps about human health and seafood consumption by giving precise and relatable information to consumers.
- Give basic information about the marine food web.
- Inform about how microplastics originate and accumulate in marine organisms.
- Inform about the risks of bioaccumulation and biomagnification.
- Inform about quality checks for processed seafood.
- Inform about the manipulation processes of frozen seafood.
- Inform about the EU legislation that regulates the safety of seafood products sold on the market.
- Counteract fake news around seafood safety.

- **Unveiling the complexity of seafood sustainability**

The internal conversation was held around the following questions:

- What does "sustainable seafood" mean for SEA2SEE? Can we agree on a baseline?
- How can we communicate the complexity of sustainability topics in the seafood industry?
- Is "sustainable" a term we want to include in our messages?
- How do "sustainability criteria" change in different seafood products? (e.g., what is sustainable for the octopus value chain might not be sustainable for other seafood).
- What are the perceptions and understanding of the sustainability of our stakeholders?
- What are the main conceptual confusions of sustainable seafood consumption?

Messages targeting retailers and consumers:

- Shine some light on the fuzzy concept of sustainable seafood consumption, acknowledging its complexity.
- Give the information to consumers and let them decide their own boundaries of what "buy wisely and sustainably" means.
- Inform on catching or farming methods, transportation, and packaging and how they influence on how sustainable a seafood product is.

All in all, the communication strategy addressing consumers to raise their awareness and seafood literacy, while promoting product acceptance, will be based on the following pillars:

Know Your Seafood: Educate yourself about the different types of seafood and their sustainability status. Some species are overfished or caught using destructive methods. Opt for alternatives that are abundant and have minimal impact on the marine ecosystem.

Trace Your Seafood: Demand for transparency and traceability of the products you are buying or consuming. Learn information about the origin of the seafood, the fishing gears, or the aquaculture practices. Investigate the steps of the seafood value chain to bridge the knowledge gap from sea to plate.

Diversify Your Choices: Explore a variety of seafood options and try lesser-known species. By diversifying your choices, you reduce the demand for overfished species and contribute to the conservation of marine biodiversity.

Use technological support for your seafood choices: Technological advances can bring information to your hands and it is your responsibility to make use of the available tools for making informed decisions.

Reduce Food Waste: Purchase seafood in quantities that you can consume to minimize food waste. Wasting seafood also means wasting the resources and energy that went into its production and transportation.

Look Out for Sustainable Options: When purchasing seafood, look for labels like MSC (Marine Stewardship Council) or ASC (Aquaculture Stewardship Council) certification. These labels indicate that the seafood has been responsibly sourced and harvested.

Your choices can change the seafood industry: as consumers, you have the right to know information about the products you are buying, but you are also responsible for your choices. Consumers' choices have the potential to change the market toward more sustainable offers if the demand increases.

Spread the Word: Share your knowledge about responsible seafood consumption with friends, family, and colleagues. Encourage others to make informed choices and contribute to the preservation of our oceans for future generations.

8. CONCLUSIONS

In conclusion, this Consumer Engagement strategy of the SEA2SEE project would serve as a guideline to empower consumers in make informed decisions when it comes to sustainable seafood consumption. To achieve this, the promotion of sustainable seafood consumption and addressing misconceptions and concerns about the seafood industry is one critical issue. By fostering seafood literacy and building trust in sustainability, the strategy encourages responsible buying behaviour and lays the foundation for a more informed and engaged seafood consumer. The main pillars to achieve this are based on 7 topics:

1. **Collective Intelligence**: The incorporation of co-creation process to identify and address the specific barriers faced by consumers in adopting responsible seafood practices, enhances the engagement strategy's trustworthiness and credibility making the strategy more inclusive and reflective of the community's concerns and interests.
2. **Fostering Seafood Literacy:** The engagement strategy aims to enhance seafood literacy among consumers, helping them understand the complexities of the seafood industry and its sustainability aspects. By providing clear and relatable information, consumers are encouraged to make conscious decisions about their seafood purchases.

3. **Empowering Consumers:** The engagement strategy successfully empowers consumers by providing them with transparent information about the seafood supply chain through blockchain processes. This transparency builds trust and enables consumers to make more informed and sustainable seafood choices.
4. **Promoting Responsible Seafood Consumption:** The strategy effectively promotes responsible seafood consumption by dispelling misconceptions about aquaculture and marine fisheries. By highlighting the safety and sustainability of seafood products, it encourages consumers to support responsible fishing practices and contribute to marine conservation.
5. **Encouraging Responsible Buying**: The engagement strategy encourages responsible buying behaviors by informing consumers about catching or farming methods, transportation, and their influence on seafood sustainability, supporting environmentally friendly practices.
6. **Collaboration with Stakeholders:** The strategy involves a wide range of stakeholders, an approach that ensures that the message reaches a diverse audience, increasing the impact of the SEA2SEE project's goals.
7. **Bridging Knowledge Gaps:** The engagement strategy will work in bridging knowledge gaps related to seafood consumption, traceability, and sustainability. By providing accessible and understandable information, consumers are more likely to actively participate in making positive changes in the seafood consumption.

9. ANNEXES

9.1 LIST OF RELEVANT PAPERS ON SEAFOOD CONSUMPTION AND CONSUMER ENGAGEMENT

Authors	Year	Title	Topic
Aanesen M., Armstrong C., Bloomfield H., et al	2014	What does stakeholder involvement mean for fisheries management?	Engagement and Awareness Campaigns
Altiok, S., Murthy A, Iha K., et al	2021	Reducing Mediterranean Seafood Footprints: The role of consumer attitudes	Sustainability and Ecolabels
Azevedo Perry E., Thomas H., Samra H., et al	2017	Identifying attributes of food literacy: a scoping review	Seafood Literacy
Bacher K.	2016	Perceptions and misconceptions of aquaculture: a global overview	Seafood Literacy
Bacher K., Gordoa A., Mikkelsen E	2014	Stakeholders' perceptions of marine fish farming in Catalonia (Spain): A Q-methodology approach	Consumers' needs and purchasing trends
Balan C	2021	How does retail engage consumers in sustainable consumption? A systematic literature review	Engagement and Awareness Campaigns
Barclay, K., Miller, A.	2018	The Sustainable Seafood Movement Is a Governance Concert, with the Audience Playing a Key Role	Sustainability and Ecolabels
Batzios C., Angelidis. P., Moutopoulos, D	2001	Consumer's attitude concerning the marine captured fish market in Greece.	Seafood Literacy
Brecard D., Lucas S., Pichot N., et al	2012	Consumer preferences for eco, health and fair trade labels. An application to seafood product in France	Engagement and Awareness Campaigns/ Sustainability and Ecolabels
Bryson J	2004	What to do when stakeholders matter: Stakeholder Identificatixon and analysis techniques	Engagement and Awareness Campaigns
Carlucci D., Nocella G., De Devitiis B. et al.	2015	Consumer purchasing behaviour towards fish and seafood products. Patterns and insights from a sample of international studies	Consumers' needs and purchasing trends

Cawthorn D., Baillie C., Mariani S.	2018	Generic names and mislabeling conceal high species diversity in global fisheries markets	Trust / Seafood Literacy
Cusa M., Falcao L., De Jesus J et al.,	2021	FIsh out of water: consumers' unfamiliarity with the appearance of commercial fish species	Seafood Literacy
Ding L., Liu M., Yang Y. et al.	2022	Understanding Chinese consumers' purchase intention towards traceable seafood using an extended Theory of Planned Behavior model	Consumers' needs and purchasing trends
Duggan D., Farnsworth K., Kraak S.,	2013	Identifying functional stakeholder clusters to maximise communication for the ecosystem approach to fisheries management	Engagement and Awareness Campaigns
Gaviglio A., Demartini E., Mauracher C et al	2014	Consumer perception of different species and presentation forms of fish: An empirical analysis in Italy	Consumers' needs and purchasing trends
Girard, S., & Paquotte, P	2003	The French market for fresh fish: an opportunity for farmed cod XV EAFE Conference, Ifremer, Brest,	Seafood Literacy
Govzman, S,. Looby S., Wang X et al.,	2021	A systematic review of the determinants of seafood consumption	Consumers' needs and purchasing trends
He J.	2022	Sustainable Seafood Consumption in Action: Reinvigorating Consumers' Right to Information in a Borderless Digital World	Engagement and awareness campaigns
Hicks, D., Pivarnik, L., McDermott, R.	2008	Consumer perceptions about seafood – an Internet survey	Consumers' needs and purchasing trends
Hooykaas M., Schilithuizen M., Aten C. et al	2019	Identification skills in biodiversity professionals and laypeople: a gap in species literacy	Seafood Literacy
Iles A.	2007	Making the Seafood Industry More Sustainable: Creating Production Chain Transparency and Accountability	Engagement and awareness campaigns/ Trust
Jacobs S., Sioen I, Marques A et al	2018	Consumer response to health and environmental sustainability information regarding seafood consumption	Consumers' needs and purchasing trends
Jacquet J., Pauly D.,	2007	The rise of seafood awareness campaigns in an era of collapsing fisheries	Engagement and Awareness Campaigns
Jæger, B., Mishra, A.	2020	Iot platform for seafood farmers and consumers	Consumers' needs and purchasing trends

Lamy J., Szejda K	2020	Literature Review Consumer Preferences for Seafood and Applications to Plant-Based and Cultivated Seafood	Consumers' needs and purchasing trends / Engagement and Awareness Campaigns
Lewis S., Boyle, M	2017	The Expanding Role of Traceability in Seafood: Tools and Key Initiatives	Trust
Lucas S., Salladarré F., Brecard D.,	2018	Green consumption and peer effects: Does it work for seafood products?	Consumers' needs and purchasing trends
Mackinson S., Wilson D., Galiay P et al	2011	Engaging stakeholders in fisheries and marine research	Engagement and Awareness Campaigns
Marques M., Torres, C., García-Fernández, F et al	2021	FishChoice 2.0: Information on health benefits / risks and sustainability for seafood consumers	Engagement and Awareness Campaigns
Masi M., Di Pasquale J., Vecchio Y., et al	2022	A cross-sectional study in Mediterranean European countries to support stakeholders in addressing future market demands: Consumption of farmed fish products	Consumers' needs and purchasing trends
Mesnildrey L., Lesueur M., Gouin S.	2010	IIFET 2010 Montpellier Proceedings MOTIVATIONS AND NEEDS OF CONSUMERS OF FRESH SEAFOOD PRODUCTS IN FRANCE: NEW OPPORTUNITIES AND MARKETING STRATEGIES	Consumers' needs and purchasing trends
Costa Leal M., Pimentel, T., Ricardo,F.,Rosa ,R., and Calado, R.	2015	Seafood traceability: current needs, available tools, and biotechnological challenges for origin certification	Consumers' needs and purchasing trends
Mikalsen K., Jentoft S.	2001	From user-groups to stakeholders? The public interest in fisheries management	Engagement and Awareness Campaigns
Miller,D., Mariani, S.	2010	Smoke, mirrors, and mislabeled cod: poor transparency in the European seafood industry	Trust
Mitchell R., Agle B., Wood D	1997	Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts	Engagement and Awareness Campaigns
Oken E., Choi A., Karagas M., et al.	2012	Which fish should i eat? Perspectives influencing fish consumption choices	Sustainability and Ecolabels/Consumers' needs and purchasing trends
Olsen, P., Boris M.	2013	How to define traceability	Trust

Paolacci S., Mendes, R., Klapper, R., Velasco, A et al.	2021	Labels on seafood products in different European countries and their compliance to EU legislation	Sustainability and Ecolabels
Penca J.	2020	Mainstreaming Sustainable Consumption of Seafood Through Enhanced Mandatory Food Labeling	Engagement and Awareness Campaigns/ Sustainability and Ecolabels/ Consumers' needs and purchasing trends
Pieniak Z., Verbeke W., Scholderer J., et al.	2008	Impact of consumers' health beliefs, health involvement and risk perception on fish consumption: A study in five European countries	Consumers' needs and purchasing trends
Reig L., Escobar C, Carrasson M et al.	2019	Aquaculture perceptions in the Barcelona metropolitan area from fish and seafood wholesalers, fishmongers, and consumers	Consumers' needs and purchasing trends
Reinders M., Banovic M., Guerrero L. et al.	2016	Consumer perceptions of farmed fish: A cross-national segmentation in five European countries	Engagement and Awareness Campaigns/ Sustainability and Ecolabels/ Consumers' needs and purchasing trends
Richter I, Kclockner C.	2017	The psychology of sustainable seafood consumption: A comprehensive approach	Trust/ Consumers' needs and purchasing trends/ Sustainability and Ecolabels
Risius A., Hamm U., Janssen M	2019	Target groups for fish from aquaculture: Consumer segmentation based on sustainability attributes and country of origin	Consumers' needs and purchasing trends
Roheim, C.A., Bush, S.R., Sanchirico, J.N., Uchida, H.	2018	Evolution and future of the sustainable seafood market	Sustainability and Ecolabels
Sacchettini G., Castellini G.,	2021	Assessing consumers' attitudes, expectations and intentions towards health and sustainability regarding seafood consumption in Italy	Consumers' needs and purchasing trends
Santiago J, Ballesteros M., Chapela R et al.,	2015	Is Europe ready for a results-based approach to fisheries management? The voice of stakeholders	Engagement and Awareness Campaigns
Scherer C, Holm P	2020	FoodSmart City Dublin: A Framework for Sustainable Seafood	Engagement and Awareness Campaigns
Silver J., Hawkins S.	2017	"I am not trying to save fish, I am trying to save dinner": Media, celebrities and sustainable seafood as a solution to environmental limits	Engagement and Awareness Campaigns
Stancu V., Brunso K., Krystallis A et al	2022	European consumer segments with a high potential for accepting new	Consumers' needs and purchasing trends

		innovative fish products based on their food-related lifestyle	
Sterling B., Chiasson M.A.	2014	Enhancing seafood traceability - Issues Brief	Trust
Tamm E., Schiller L., Hanner R.,	2016	Chapter 2: Seafood Traceability and Consumer Choice	Trust/ Consumers' needs and purchasing trends
Van Cuong C., Dart P., Dudley N, et al	2018	Building Stakeholder Awareness and Engagement Strategy to Enhance Biosphere Reserve Performance and Sustainability: The Case of Kien Giang, Vietnam	Engagement and Awareness Campaigns
Verbeke, W., Vanhonaker F., Sioen, V., Van Camp, J.	2007	Perceived Importance of Sustainability and Ethics Related to Fish: A Consumer Behavior Perspective	Sustainability and Ecolabels / Consumer's needs and purchasing trends
Witter A, Murray G., Sumalia U.,	2021	Consumer seafood preferences related to alternative food networks and their value chains	Consumers' needs and purchasing trends
Zander K., Feucht Y.	2018	Who is prepared to Pay for Sustainable Fish? Evidence from a Transnational Consumer Survey in Europe	Consumers' needs and purchasing trends
Zander K., Feucht Y.	2018	Consumers' Willingness to Pay for Sustainable Seafood Made in Europe	Consumers' needs and purchasing trends

9.2 SURVEY TO IDENTIFY BARRIERS

Barriers to the consumption of sustainable seafood

Fields marked with * are mandatory.

Dear participant,
Thanks on behalf of the Horizon Europe Sea2See project Consortium for taking the time to fill out this questionnaire.

This survey explores consumers' difficulties in identifying sustainable seafood products and making informed decisions when buying or consuming farmed or fished seafood.

We believe that as a consumer, you have the right to know about the products you buy, and you have the responsibility of checking available information for making an informed decision.

The results of this survey will be used to develop actions for supporting consumers in their seafood purchasing and consumption while gaining their trust.
Any information you provide will be confidential and only used for statistical purposes.
The following questionnaire will require approximately 5 minutes to complete.

Disclaimer data protection
[All the gathered information will be handled in anonymity and aggregated, this means that in no way it will be possible to determine your identity. Furthermore, the gathered information will be treated in agreement with the current laws on data protection (REGULATION (EU) 2016/679 of the EU Parliament and of the Council).]
If you have any question or concern about the survey, please do not hesitate to contact us at survey@sea2see.eu

Some information about your purchasing and consumption trends

On average, how often do you eat each of the following seafood categories (wild captured or farmed)?

Some information about your purchasing and consumption trends	More than once a week	Once a week	Every 2-3 weeks	Once a month	4-6 times a year	1-3 times a year	Less than once a year	Never
* FISH (consider all fish – fresh, dried, smoked, frozen, canned, etc.)	○	○	○	○	○	○	○	○
* CRUSTACEANS (Crabs/ lobsters/ shrimps etc.)	○	○	○	○	○	○	○	○
* CEPHALOPODS/ MOLLUSCS (Octopus/ squid/ cuttlefish etc.)	○	○	○	○	○	○	○	○
* BIVALVES (Mussels/ clams/ scallops etc.)	○	○	○	○	○	○	○	○

* Where do you usually buy seafood products? [multiple answers possible]

- [ ] Supermarket
- [ ] Local market (fixed or mobile)
- [ ] Specialized fishmongers
- [ ] Frozen food shops
- [ ] Directly from fishers/ aquaculture producers
- [ ] E-commerce/online shops
- [ ] I do not buy seafood
- [ ] I prefer not to answer
- [ ] Other, please specify:

Other, please specify:

* What is your preference regarding seafood?

- ( ) Wild captured
- ( ) Farmed
- ( ) I have no preference
- ( ) Not applicable
- ( ) Prefer not to answer

What are the main seafood species that you usually buy and consume (fish, crustaceans, cephalopods /molluscs, bivalve)?

* What is important for you when shopping for seafood? [multiple answers possible]

- [ ] Freshness
- [ ] Taste and texture of the seafood
- [ ] Health and nutritional benefits
- [ ] Price
- [ ] Method of aquaculture production
- [ ] Method of fishing (e.g. fishing gear used)
- [ ] Origin of the product
- [ ] Trusted brand
- [ ] Certifications of sustainability by authorized bodies (e.g. MSC, ASC, Friends of the Sea among others.)
- [ ] Certifications of origin (e.g Denominación de origen Delta del Ebro etc.)
- [ ] Certifications of type of production (e.g., artisanal fishing)
- [ ] Certifications of social responsibility (e.g., fairtrade)
- [ ] Certifications of high quality (e.g Galicia Calidade)
- [ ] I don't know
- [ ] Other, please specify:

Other, please specify:

* What information about the seafood product (wild captured or farmed) would you like to be inlcuded in the tag? [multiple answers possible]

- [ ] System of production
- [ ] If wild captured, fishing gear
- [ ] If farmed, the aquaculture method
- [ ] Legal size
- [ ] The scientific name of the species
- [ ] Certification/eco-label
- [ ] Product/capture size
- [ ] If wild captured, country or zone of origin
- [ ] If farmed, country of production
- [ ] I do not buy seafood
- [ ] I don't know
- [ ] Other, please specify:

Other, please specify:

What information would you like to see included in a Restaurant menu, regarding seafood products? [multiple answers possible]

- [ ] System of production (wild captured/farmed)
- [ ] If wild captured, fishing gear
- [ ] If farmed, the aquaculture method
- [ ] Indication of proximity
- [ ] The scientific name of the species
- [ ] Certification/eco-label
- [ ] Product/capture size
- [ ] If wild captured, country or zone of origin
- [ ] If farmed, country of production
- [ ] I do not eat seafood in restaurants
- [ ] I don't know
- [ ] Other, please specify:

Other, please specify:

Your opinion on seafood sustainability and barriers to sustainable consumption

Rate the importance of the following items to ensuring the sustainability of wild captured or farmed seafood:

	Very important	Important	Somewhat important	Not important at all	I don't know	Prefer not to answer
Seasonality (e.g. avoiding certain species during the reproductive season)	○	○	○	○	○	○
Type of fishing gear and related impact on the environment	○	○	○	○	○	○
Type of aquaculture method and related impact on the environment	○	○	○	○	○	○
Type of packaging	○	○	○	○	○	○
Support to local economies	○	○	○	○	○	○
Health and safety standards	○	○	○	○	○	○
Decent and fair working conditions for fishers and aquaculture workers	○	○	○	○	○	○
If wild captured, country or zone of origin	○	○	○	○	○	○
If farmed, country of production	○	○	○	○	○	○
Origin from small-scale or artisanal fisheries	○	○	○	○	○	○
Minimizing unwanted catch of non-target species	○	○	○	○	○	○
Population status (fish stock)	○	○	○	○	○	○
Eco-labelling (e.g. MSC, ASC, Friends of the Sea among others)	○	○	○	○	○	○
Others certifications (e.g. origin, type of production, social responsibility, high quality etc.)	○	○	○	○	○	○

* As a consumer, what do you think is lacking for achieving sustainable seafood consumption (both wild captured and farmed)?
We suggest answering in bullet points, and here is a sample of starter phrases you can use: Failure to.../Lack of.../Hostility toward.../Shortage of.../Inadequate.../Conflict between.../Unwillingness to.../Demand for...

* Based on your experience, what factors are limiting your purchasing of sustainable seafood products?
We suggest answering in bullet points, and here is a sample of starter phrases you can use: Failure to... /Lack of.../Hostility toward.../Shortage of.../Inadequate.../Conflict between.../Unwillingness to.../Demand for...

* Imagine an innovative mobile app has just been released to help you making informed decision when buying seafood. Which information should this app contain to support your purchasing? What you might expect from using this app?
We suggest answering in bullet points

Some information about you

* Gender
- Female
- Male
- Other
- I prefer not to say

* Age:
- <20
- 20-35
- 36-49
- 50-64
- >65
- I prefer not to say

* Please indicate your country of residence

* In which category do you identify the most?
- Chef / cook
- Consumer
- Restaurant owner
- Food blogger
- Supermarket employee
- Seafood producer
- Representative of a packaging company
- Member of NGOs

- Public administration worker
- Media
- Academia/ scientist
- Policymaker
- Environmental consultant
- Member of intergovernmental organizations
- Canteen employee
- Student
- Market owner
- Food retailer
- Fish auction buyer
- Prefer not to say
- Other, please specify:

Other, please specify:

What is the highest educational level that you have achieved to date?

- No formal education
- Primary education
- Lower secondary education
- Upper secondary education
- University Degree or equivalent
- Post Graduate Degree (Master, Doctorate, MBA etc.)

* How far is the place you live from the sea in km (take into consideration the seaside place closest to your home)?

- 0-10 km
- 11-30 km
- 31-60 km
- 61-100 km
- > 100 km

Involvement in the Sea2See project

Thank you once again for dedicating your time to fill in this questionnaire.

This final section explores the options of you getting involved in the Sea2See project, throughout its entire duration (4 years)

Would you like to be involved in upcoming workshops to identify and prioritize the barriers to sustainable seafood consumption and product acceptance?

- Yes
- No

Would you like to receive updates on the Sea2See achievements and outputs?

- Yes
- No

Would you like to take part in future surveys or engagement actions, within the Sea2See project?

- Yes
- No

If you replied “yes” to any of the above questions, please provide your email

9.3 1-DAY MULTI-STAKEHOLDERS WORKSHOP

9.3.1 FRANCE REPORT

COLLECTIVE INTELLIGENCE PROCESS AND REPORT SECTIONS

1 - ONLINE BARRIER GENERATION:

N° of respondents: 84
Nº. of barriers collected: 118

A short summary of data analysis (demographic data, purchasing habits, behavior toward sustainability) *(350 words)*

Demographic data – Main data (graph in annexe)

- The number of men and women responding to the questionnaire was almost the same (53 % men vs 45 % women).
- Almost half of respondents are in the 20-35 age group (48 %).
- Almost all respondents live in France (93 %).
- Consumers and chefs were the main respondents to the questionnaire (35 % each). Next come the students (12 %).
- Almost half of respondents have a degree in upper secondary education (47 %).

Purchasing habits – Main data (graph in annexe)

- Among the various categories of seafood, fish is the most frequently consumed. 29 people eat it more than once a week and 30 once a week. 78 people eat it at least once a month. On the other hand, 3 never eat fish.
- 44 people eat crustaceans at least once a month. On the other hand, 12 people do not eat any or eat it less than once a year.
- 37 people eat cephalopods at least once a month. On the other hand, 11 people do not eat any or eat it less than once a year.
- Bivalves are the least commonly consumed seafood products. 24 people eat bivalves at least once a month. On the other hand, 17 people do not eat any or eat it less than once a year.
- The majority of respondents buy their seafood from supermarkets (28 %), specialized fishmongers (26 %) or local markets (24 %).
- 3/4 of respondents prefer to buy wild seafood.
- The three most important criteria for respondents when they buy seafood are “freshness”, “origin of the product” and “taste and texture of the seafood”. The three less important criteria (among those proposed) are “trusted brand”, “certifications of high quality” and “method of aquaculture product”.
- The three most important criteria for respondents they would like to see included on tags are “ if wild captured, country or zone of origin”, “if wild captured, fishing gear” and “if farmed, country of production”. The three less important (among those proposed) are “legal size”, product/capture size) and the scientific name”. The important thing to note is that all these criteria, with the exception of those relating to size, are compulsory on tags. This indicates either a lack of respect

for the law on the part of retailers, or the fact that consumers are unaware that these criteria are already present on tags.

- The three most important criteria for respondents they would like to see included in a restaurant menu are “system production (wild captured/farmed)”, “if wild captured, country or zone of origin” and “indication of proximity”. The three less criteria chosen are “the scientific name of the species”, “products/capture size” and “if farmed, the aquaculture method”. Note that 4 people never eat fish in restaurants.

Behavior toward sustainability – Main data (graph in annexe)

- The three most important criteria for respondents are "Seasonality", "Population status" and "Type of fishing gear and related impact in the environment". The four less important (Not important at all) are “Eco-labelling”, “Other certifications”, “Support to local economies” and “Health and safety standards”.
- Top 10 most purchased and consumed species:
    - Salmon
    - Mussels
    - Mackerel
    - Cod
    - Prawn
    - Oyster
    - Tuna
    - Scallop
    - Whiting
    - Sardine
- If a mobile application has just been launched to help to choose seafood, consumers would like to have it with them:
    - Quick and easy to use
    - Help to know which species to choose and when to choose it
    - Color-coded according to sustainability
    - Varied and detailed choice of species
    - Presentation of the species (lifestyle, alimentation...)
    - Scientific name
    - Fishing methods
    - Exact origin
    - State of stocks
    - Size of fish
    - Date fished
    - Reproduction period
    - Seasonality
    - Suggested alternative species when a species is overexploited
    - Processing method and production after fishing
    - Qrcode with: stock status of the product, name of the fishing boat, date of catch or time spent in fishing gear, port of landing, seasonality of the product
    - Qrcode for access to product traceability

- Certifications/labels
- Sustainable commitments respected
- Type of farming
- Farming conditions
- State of the water in which it was caught / least polluted fishing areas
- Recipe ideas
- Nutritional and organoleptic quality
- Information on where to buy them near you
- Purchase price
- Means of preservation
- Fair remuneration for fishermen/farmers
- Impact on the environment

2 - BARRIER CATEGORIZATION:

2.1 Composition of the Internal Working Group (number of members and profiles)

- Laura Reyes: European project manager, Vitagora
- Alessia Bacchi: Scientific officer, Ethic Ocean
- Flore Berqué: Project manager, Ethic Ocean
- Aurélie Duriez: Project manager, Ethic Ocean
- Elisabeth Vallet: Director, Ethic Ocean

2.2 The final list of Categories and Barriers to be used at the 1-day multi-stakeholder workshop.

The number of barriers resulting from the questionnaire is significant. This is due to the large number of responses we received, but also to the care we took not to misinterpret responses when they were not clear. Thus a barrier initially written by one respondent may have become several barriers.

The barriers have been divided into 10 categories.
Category 1: Insufficient (available) general information for the consumer

- Lack of consumer information
- Lack of information on the packaging (preserves, processed products, etc.)
- Lack of product information (fish stalls)
- Lack of information from sellers to consumers
- Lack of awareness in places of great consumption and purchases
- Lack of information on the species
- Lack of communication on the seasonality of sea products
- Issue identification of species
- Lack of differentiation between farmed and wild
- Lack of key information relating to the sustainability
- Confusion of species because of the lack of scientific names (written in Latin)
- Lack of information on points of sale

- Lack of communication on the topic
- Lack of explanations from professionals (suppliers)
- Lack of simple information: is it more sustainable to buy a Norwegian farmed product or a French fishing product?
- Too much information contradictory or not easy to assess

Category 2: Lack of fishing information
- Lack of knowledge of fishing conditions
- Lack of actual fishing date
- Lack of information on fishing areas, currently incomprehensible to a consumer
- Lack of origin information
- Absence of the fishing port
- Absence of the type of fishing (artisanal or industrial)
- Lack of information on fishing technique
- Lack of up-to-date information on stock status at points of sale
- Absence of information on the fragility of certain species in places of sale
- Absence of color code in connection with the state of stocks

Category 3: Lack of aquaculture information
- Lack of information on the feeding of products from European farms
- For aquaculture, lack of country of production
- Lack of information on breeding conditions
- Lack of information on the food given in fish farms
- Absence of the date of leaving the water for farmed species
- Density in the basins

Category 4: Lack of knowledge (professionals and consumers)
- Lack of product knowledge
- Lack of knowledge of sellers (retail fishmongers and supermarkets)
- Lack of awareness and information by sellers who should push towards other sustainable products
- Lack of education
- Lack of knowledge on the part of consumers on stocks
- Lack of knowledge on the part of consumers on the seasonality of seafood products
- Lack of training for caterers
- Lack of training
- Lack of knowledge about species other than bass and salmon
- Complex subject for a novice to understand
- Lack of knowledge on the part of professionals (suppliers)
- Lack of awareness among cooks
- Lack of awareness
- Consumer ignorance
- Some industry players are unaware of the importance of sustainable fishing
- Professionals' lack of knowledge of stocks status
- Professionals' lack of knowledge about the fragility of certain species
- Lack of knowledge about the concept of fish stocks

- Lack of consumer education

Category 5: Lack of transparency
- Opacity in reading fishing areas
- Information not reliable
- Lack of transparency about fishing methods
- Lack of transparency on fishing areas
- Lack of transparency at point of sale
- Lack of clarity when buying (display...)
- Insufficiently identified products on fishmongers' shelves
- Lack of traceability
- Explanation of the product's price, to understand that it's not an expensive product, but rather the right price
- Sometimes false labelling leads to mistrust

Category 6: Buying behavior (professionals and consumers)
- Inadequacy between consumers who always buy the same products (salmon, cod, shrimp, etc.) and the state of the resource / production conditions
- Inadequacy of certain restaurateurs' sourcing practices
- Consumer expectations for certain products...
- Refusal to eat "ugly" seafood products
- Search for unreasonably low prices
- Lack of time to get information
- High demand for seafood

Category 7: Lack of ethics from production to consumption
- Lack of professional ethics (fishing and aquaculture)
- Lack of regard for animal welfare
- Lack of animal compassion
- Types of fishing rarely sustainable
- Unsustainable breeding
- For many fishermen, lack of respect for marine life
- Lack of ecological awareness and respect for aquatic flora and fauna
- Lack of consideration for habitats
- Lack of consideration for by-catch
- Lack of interest in the status of fishing areas
- Too much seabed destruction

Category 8: Markets issues
- Lack of offer
- Few sustainable offers
- Lack of choice on the shelves
- Inadequacy between consumers' desire for greater sustainability and the products available on the market (unsustainable and undiversified species).
- Countries of origin too far away (lack of proximity)
- Supply difficulties
- Trivialization of fish in sushi and poke bowl offers

- Distance from sea
- Conservation
- High price
- Increasing prices
- Lack of alternatives to consume something similar without impacting the environment

Category 9: Valuation issues
- Highlighting "noble" fish
- Lack of focus on lesser-known species
- Lack of preparation proposals
- Labels often described as unreliable
- Unreliable labels (no guarantee of good resource management)
- Lack of communication from labels about their criteria for certification
- Labels that cannot be trusted (fishing techniques that have an impact on the environment)
- Insufficient promotion of local and European products vs. imported products

Category 10: Political and regulatory issues
- Legal catch size too low (because below sexual maturity)
- Economic issues / Fishing activity
- Lack of support for sustainable fishing
- Economic conflict between different sectors (fishing and aquaculture)
- Lack of stricter traceability regulations
- Inadequacy between the constraints of fishing professionals and European authorities
- The weight of the fishing giants (economic and political power)
- Too many fishery industry
- Lack of concrete Government involvement through information and obligation measures
- Products on display even during breeding season
- Overfishing
- Lack of scientific data for certain species (not monitored)
- Illegal products for sale
- Not enough selective fishing
- Underpaid fishermen
- Different fishing regulations in different countries (e.g. UK / competing with France on the same zone)
- By-catch fishing
- Depletion of fish stocks
- Failure to comply with quotas
- A lack of stricter regulations
- Lack of management of fished resources leads to a lot of waste

3 - ONE-DAY MULTI-STAKEHOLDER WORKSHOP

Date: Wednesday June 14
Location : FERRANDI Paris, 28 rue de l'Abbé Grégoire, 75006 Paris

Attendees:

- Jérémie BARNAY: cooking teacher, FERRANDI Paris
- Philippe BLAIS: Quality and Sustainable Development Director, Unima
- Corinne COPIN: Manager/Animator of the Knowledge Center, Fondation de la Mer
- Frédéric FAVRET: Previous Seafood Sustainability Director at Pomona Terre Azur
- Christopher LAHAY: Quality responsible, Rooser
- Patricia LE CHEVALLIER: Journalist
- Bastien RIERA: Managing Director, Gloria Maris
- Baptiste SALOMON: cooking teacher, FERRANDI Paris
- Fawze SANNIER: Fishmonger (MOF – Meilleur Ouvrier de France)
- Group of Students - BTS Hotel and Catering Management level

The workshop was organized later than previously planned (April/May) due to the difficult social conditions in France (long period of important strike / retirement reform).
Furthermore, the economic context made the mobilization of stakeholders difficult. Many of them confirmed their interest in the topic of the workshop, but clearly informed us that they may not attend it if other working/business emergency would appear that day.
Then, given the risk of failing to mobilize professionals, and following the interest of some cooking teachers that we approached as stakeholders, there was the opportunity to organize the workshop at the Paris CCI hospitality school, FERRANDI Paris, involving their students (in high level/having also already a professional experience). This was the opportunity to ensure the organization of the event.

We have been successful however, with the participation of 9 representative stakeholders from the seafood chain. But it has not been possible to mobilize representatives from the national administration due to their agenda and social priorities.
The students were divided in 3 groups with 1 voice/vote per group in order to ensure an appropriate representativity with the different stakeholders.

3.1 A summary of the discussion around the second stage of barrier generation and categorization (350 words)

Ethic Ocean presented SEA2SEE project and its objectives. Then the barriers that have been identified through the survey.
As requested in the Submon methodology, time was accorded to the participants so they could analyze and confirm the barriers, changing barriers from category or suggesting creating new ones.
Several proposals were made and discussed and it was the opportunity to have good discussions between stakeholders.

This step took more time than expected as it was important to consider the different requests for category changes or new barriers and discuss it among all the participants. This part led to some great discussions and was very useful for understanding the categories and barriers, and ensuring that the rest of the day proceeded smoothly.

<u>List of new barriers proposed by the stakeholders</u>

Category 1:

- Complete product cycle in terms of carbon (energy expenditure) – "*There is also the environmental impact to consider. We need to take stock of how the fish is caught, transported and preserved.*"

Category 2:

- Lack of information on the life cycle of fish (reproduction period, stock recovery)

Category 3:

- Lack of information on aquaculture products and their respective qualities

- Lack of promotion of certain sustainable fish farms
- Lack of promotion of certain farmed products
- Lack of promotion of new feed inputs (algae, insects, fishery by-products)
- Lack of information on production costs and the resulting selling prices

Category 6:

- Psychological barriers to changing purchasing habits – "*There are certain products that we rarely have the opportunity to eat, even though we already consume unappetizing products because this is linked to our food culture. So, we need to change our eating habits.*"

Category 8:

- Need for the sector to safeguard its income

Category 9:

- Few opportunities to taste

Category 10:

- Short-term economic and social issues more important than long-term environmental issues – "*I think that for politicians, the main issue is to preserve the socio-economic interests of the industry in the short term, with the environment weighing less heavily in the balance*."
- Wastage on board and throughout the industry
- Fishing lobbies too powerful

List of barriers which have changed category

Moved to category 1

- Labels often described as unreliable (was in the 9th)
- Lack of communication from labels about their criteria for certification (was in the 9th)

Moved to category 4

- Lack of alternatives to consume something similar without impacting the environment (was in the 8th)

Moved to category 7

- Unreliable labels (no guarantee of good resource management) (was in the 9th)

Moved to category 8

- Economic issues / Fishing activity (was in the 10th)
- Underpaid fishermen (was in the 10th)

Moved to category 9

- Explanation of the product's price, to understand that it's not an expensive product, but rather the right price (was in the 5th)

3.2 A summary of the process of voting for the most relevant barriers (350 words)

Participants were given 10 red stickers to stick on the barrier they considered most important in each category. Then they were given 4 extra stickers to stick on the barriers they wanted. The protocol described in task 7 "Voting for the most important barriers" was followed.

List of the most important barriers

Category 1: Lack of key information relating to the sustainability
Category 2: Absence of information on the fragility of certain species in places of sale
Category 3: Lack of promotion of certain sustainable fish farms
Category 4: Lack of education
Category 5: Lack of traceability
Category 6: Search for unreasonably low prices
Category 7: Lack of ecological awareness and respect for aquatic flora and fauna
Category 9:

- Lack of focus on lesser-known species
- Explanation of the product's price, to understand that it's not an expensive product, but rather the right price

Category 10:

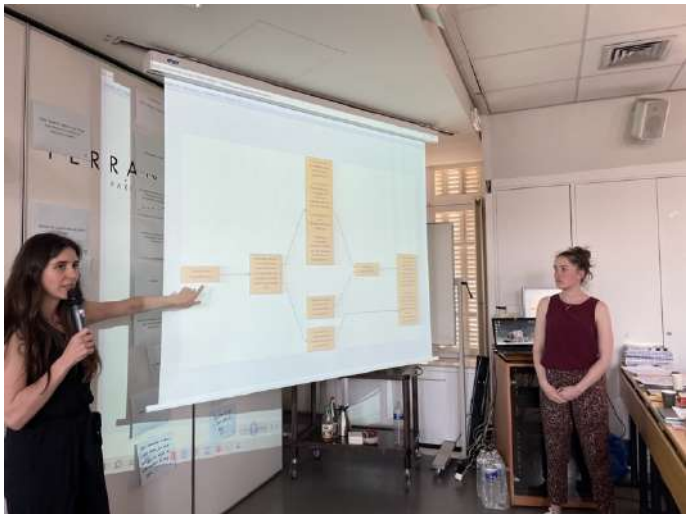
- Lack of concrete State involvement through information and obligation measures
- Short-term economic and social issues more important than long-term environmental issues

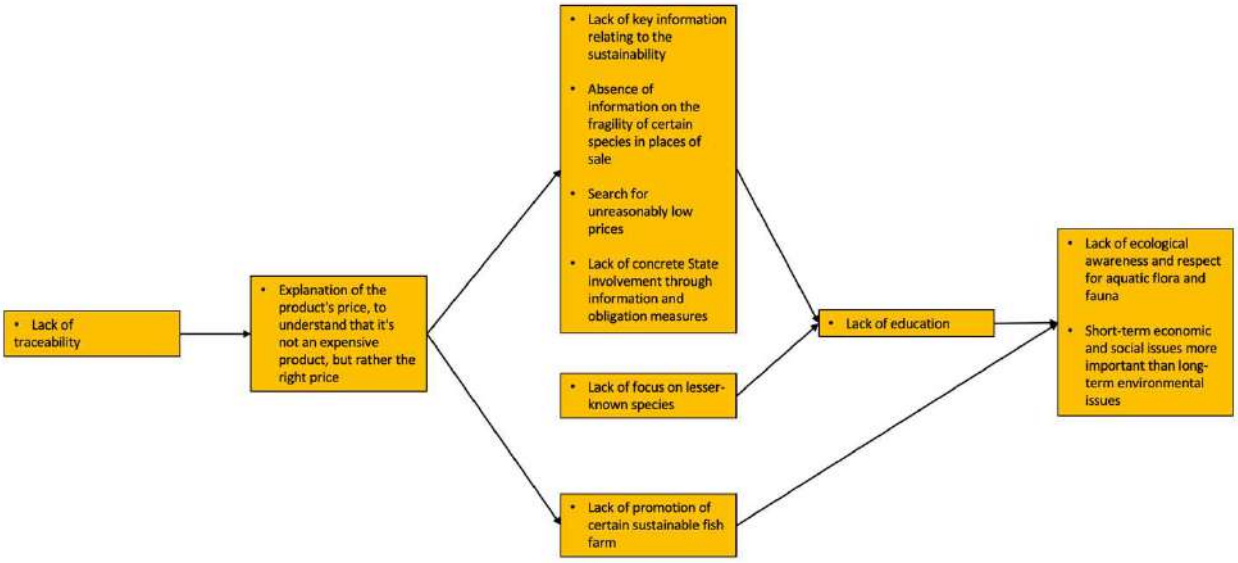
These 11 barriers were entered into the ISM software for the next task “barrier structuring”.

4 - BARRIER STRUCTURING

4.1 Short description of the map of barriers and discussion within the workshop (350 words)

The process of comparison between the different barriers, following the ISM software protocol, was done. However, this part was questioned by several participants as the process of comparison did not make sense for the majority of them. The final result was also discussed as the generated graph was not coherent with their analysis from the discussions.
A second graph had to be made, it was better but participants were still not very convinced by the logic of the graph.





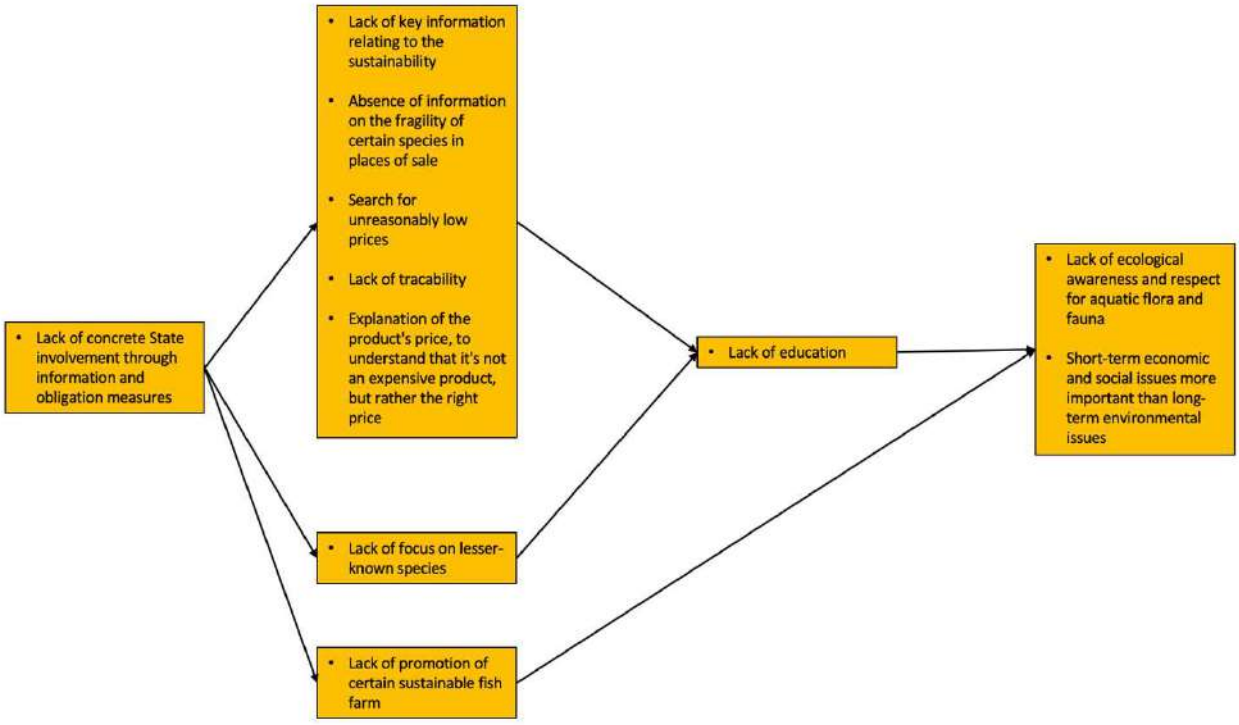
This first graph was the subject of discussion. The participants disagreed about the order of the barriers and did not fully understand how this graph was obtained as it did not reflect their thoughts.

"I don't think the links between cause and effect are obvious, they're too random, it's simplistic compared to what we've done just before."
"The two barriers that appear as the main ones (Lack of traceability & Explanation of the product's price, to understand that it's not an expensive product, but rather the right price) *on the graph are not the main ones for me"*

Then the process was engaged again with the main problematic barriers to generate a second map.

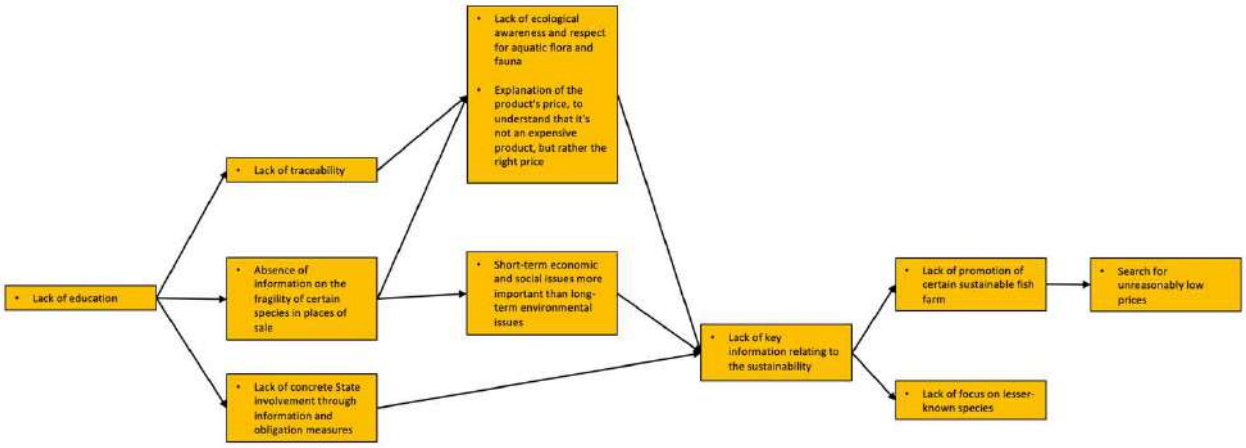
The barriers that were rediscussed and submitted again through the process are the following:

- Lack of concrete State involvement through information and obligation measures
- Lack of traceability
- Explanation of the product's price, to understand that it's not an expensive product, but rather the right price



The results gave a slightly different map, however, it did not completely convince the participants either.
Nevertheless, having the barrier "Lack of concrete State involvement through information and obligation measures" first seems to be more relevant for the stakeholders.

Following the workshop and on Submon's advice, Ethic Ocean/Vitagora team is proposing below the graph that seems to represent the best the stakeholders' thoughts and discussion on the link between barriers.



As shown in this graph the “lack of education” was mentioned as the most important barrier to moving towards greater sustainability. This barrier exacerbates the other three major barriers, i.e. “lack of traceability”, “lack of information on the fragility of certain species in places of sale” and “lack of concrete State involvement through information and obligation measures.

4 - GENERATING OPTIONS

5.1 List of solutions for each barrier category

Stakeholders and students worked together (following the wish of the participants). So 4 groups were formed, made up of stakeholders and students. Each group worked on 2 or 3 categories.

Category 1:

- Improving the health stamp
- Make information on origin and production model compulsory in restaurants

Category 2:

- Add a Qrcode to each product to check traceability

- Create an eco-label that would include together:
    - state of the resource
    - fishing season
    - threatened or non-threatened species
    - fishing method

Category 3:

- Developing semi-extensive aquaculture
- Introduce fishing/aquaculture concepts into the national education program

Category 4:

- Develop more applications or develop them more to be informed more easily
- Workshops/courses with recipe suggestions
- Create explanatory Qrcodes to display on shelves
- Implement large-scale national awareness campaigns
- Uniformity of laws applied in different countries
- Raising awareness among young people
- Create a post-baccalaureate diploma in fishmongery (complementary diploma in fishmongery in catering)
- Imposing training
- Training professionals to transmit
- Regular promotion of little-known fish

Category 5:

- Create a Qrcode with information on traceability, sustainability and culinary combinations (recipe ideas, etc.).

Category 6:

- Encouraging restaurateurs to pay attention to where their fish comes from
- Promote less noble, well-known or "ugly" fish by changing their appearance (fillets or cooked preparations)
- Set up communication campaigns in supermarkets and on social networks, and raise awareness among children from primary school onwards.

Category 7:

- For producers, introduce an ethical tax at European level
    - to finance the transition to more ethical fishing
    - increase the price and achieve a balance between ethical and non-ethical production.
- For consumers, set up a PNNS (national nutrition and health plan) awareness campaign and provide information by adding prevention to schooling (e.g. a sustainable consumption and food subject).

Category 8:

- Sustainability: ensuring that the consumption of products allows resources to be regenerated for future generations.
- Educate:
    - Raising awareness and teaching about sustainable food from an early age
    - Informative posters at the point of sale
    - Raising awareness in large companies
    - We need to raise awareness from the professional to the consumer
- Rebalance: Respect the seasonality of products to create a variation of products. Highlight little-known products

- Structuring the zones:
    - Ban fishing in protected and critical areas.
    - Encourage local trade by adapting prices according to origin.

Category 9:

- Adapting prices to the seasonal nature of species
- Highlighting the dietary properties of lesser-known fish
- Free tasting samples

Category 10:

- Provide financial assistance to fishermen to adapt their fishing methods
- Banning fishing of overexploited species
- Obliging restaurateurs to display the origin and fishing technique used
- Global funding for scientific research
- Adapting marketing sizes to maturity sizes
- Impose fishing standards on factory ships

5.2 A summary of the process of voting for the "SMARTEST" options (350 words)

Participants were given 10 red stickers. They had to stick a sticker for each category on the option that best meets the following criteria:

- Will have an impact
- The option is feasible
- Can be rolled out in a reasonable time-frame
- There are people who could champion the option

Then they were given 4 extra stickers to stick on the option they consider to be of high importance. The protocol described in task 12 "Present and Selection of Option" was followed.

<u>Top 5 options:</u>

- Create an eco-label that would include together:
    - state of the resource
    - fishing season
    - threatened or non-threatened species
    - fishing method

  "*the consumer would see it directly on the label with a logo, and would have all the information on the durability of the product*"
- Introduce fishing/aquaculture concepts into the national education program
- For consumers, set up a PNNS (national nutrition and health plan) awareness campaign and provide information by adding prevention to schooling (e.g. a sustainable consumption and food subject). "*PNNS videos to be shown on TV (along the lines of the 5 fruit and vegetables a day campaign) and incorporating into the science curriculum teaching to raise young people's awareness of fishing*"
- Banning fishing of overexploited species. "*For example, European eels that is critically endangered"*

- Create a Qrcode with information on traceability, sustainability and culinary combinations (recipe ideas, etc.). "*It would enable consumers to obtain information directly rather than buying without knowing what they are buying*"

It should be noted that the options proposed to improve awareness/training came back as a solution in more than one category. The same goes for the options proposing Qrcodes.

6 - OVERALL EVALUATION:

6.1 Did you find any difficulties in carrying out the workshop? If yes, how did you overcome them? (*350 words)*

The main difficulty in carrying out this workshop was to bring together all the stakeholders in the difficult social and economic context presented above.
We overcome this difficulty by ensuring the organization of the workshop through a cooking school who was interested in hosting it, as they are also seafood buyers concerned by the topic of the workshop.
Then Ethic Ocean and Vitagora continued to approach different stakeholders. Ethic Ocean has approached all categories of seafood chain stakeholders they are working with.

6.2 What strengths would you like to point out about the workshop event? *(350 words)*

The internal discussion group was very useful. It enabled us to familiarize ourselves with all the barriers and to anticipate all the concepts and nuances that each one might contain.

One of the strengths of this workshop was the wide range of participants. Their expertise was complementary. The meeting between the various stakeholders was very much appreciated. The discussions enabled us to understand the points of view of the various players and to highlight the challenges they each face in their activities. Moreover, every participant was very interested in the day's theme.
Stakeholders particularly appreciated working with advanced students as "future buyers and consumers" representatives.

One important point is also the good preparation beforehand and Submon's availability to answer our questions.

6.3 Is there any other comment you want to add about the entire process? (*350 words)*

The process presents some interest and the thematic is really relevant.
However, the graph process itself and the results were perceived as not reflecting the work and the discussion among the stakeholders. The various graphs were difficult to explain because of the frequent

illogical links that were created via the software. Then the proposed 3rd graph tends to reflect the discussion of the stakeholders which has been fruitful.

The satisfaction questionnaire was sent to all participants following the workshop. Below are the feedbacks with the averages out of 5 for each criterion given by Submon

- The deadline was met: 4,6/5
- The facilitator helped the workshop run smoothly: 5/5
- The room was suitable for the workshop: 3,8/5
- The process and instructions were clear: 4,6/5
- During the workshop, I had the opportunity to gain a better understanding of the obstacles to the consumption of sustainable seafood products: 4,6/5
- Through discussion, I felt free to express my opinion without being judged: 4,8/5
- During the discussion, my opinion was listened to and taken into consideration: 4,8/5

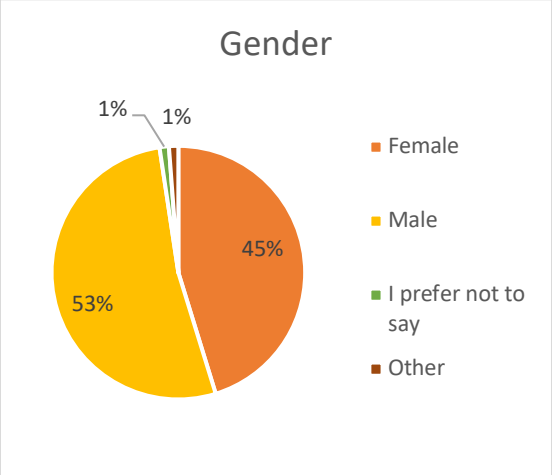
The main thing to note from this questionnaire is that our room was not considered suitable for running this workshop. The amphitheater shape was indeed not the most appropriate format but there was no other choice at that time. The process has been adapted to this constraint.
On the whole, however, the workshop went well, with participants feeling at ease and understanding the day's proceedings and objectives.

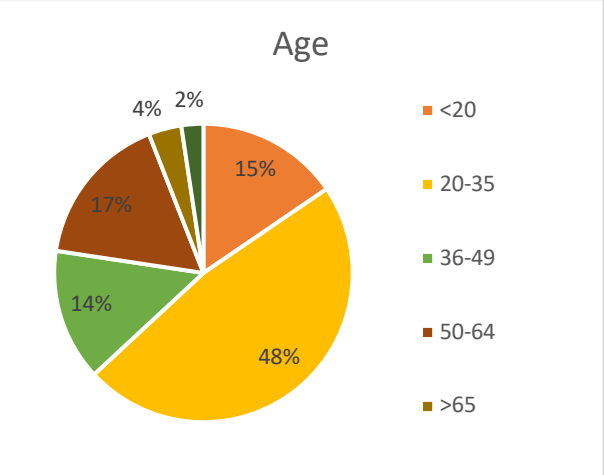
Participants leave some comments to improve the way the workshop was run:

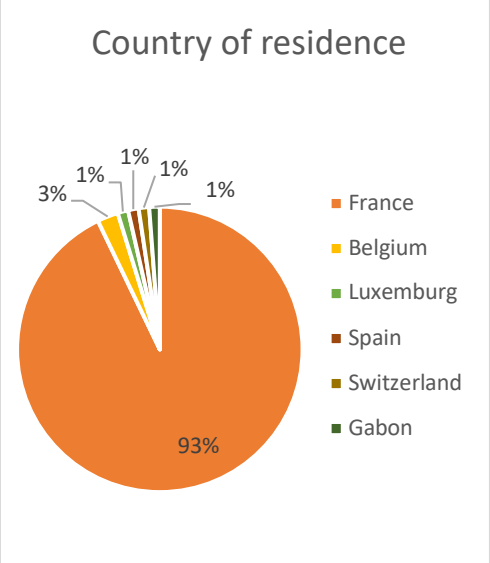
- *"I think there should have been a short vocabulary session at the beginning, or in the form of cards, as the participants were from different backgrounds and didn't put the same concepts behind the words they used."*
- *"A complex subject to tackle in a simple one-day workshop."*
- *"The 2nd vote in the morning (the dots that could be placed wherever you wanted) could have been better exploited by identifying it with a specific color, and by exploiting it specifically because it is a strong vote (it highlights THE choice of each voter). Alternatively, it could also have been organized differently by asking everyone to position themselves on an issue in each category, but giving fewer dots than categories: the aim was to force people to identify the major categories and the important cause within them. In both cases, the approach I'm proposing aims to perhaps caricature the reflection, but with the aim of simplifying it, so that we can then think about solutions that are likely to have an impact (because they act on the major causes)."*
- *"I found that the participants were very involved and the day was stimulating! I regretted that the discussions did not focus more on the psychological and gustatory brakes on the part of consumers, because I think there is a real blockage there."*

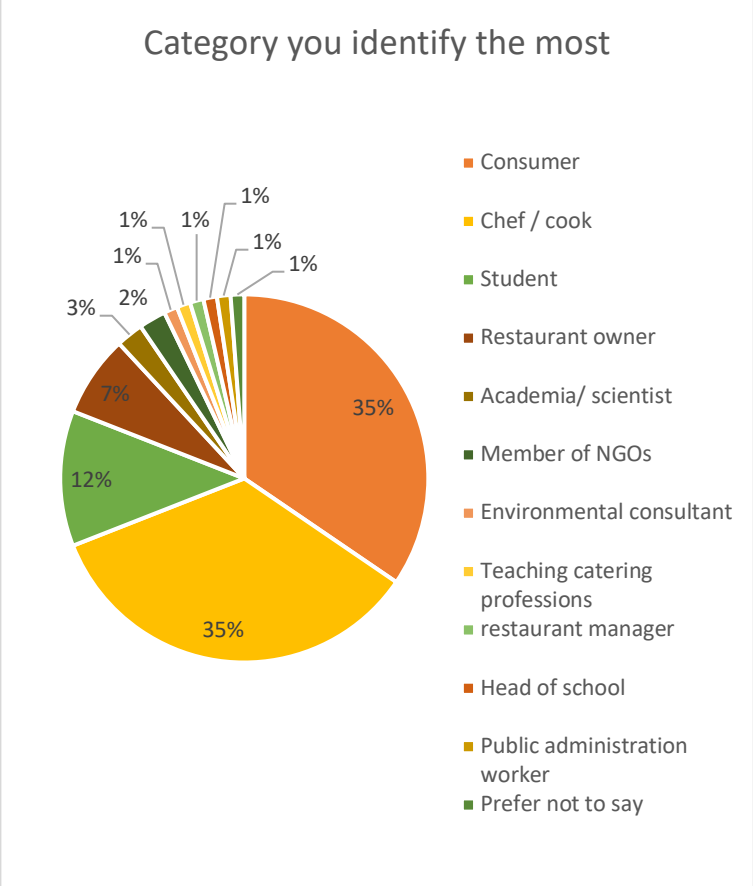
Annexes

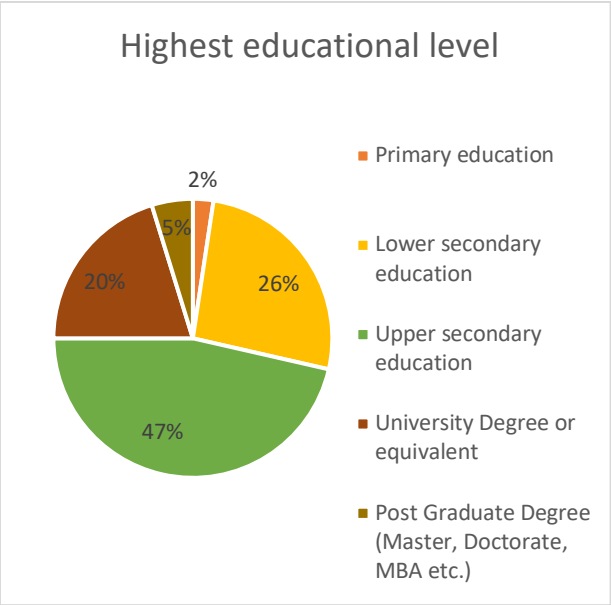
A - Demographic data – Main data

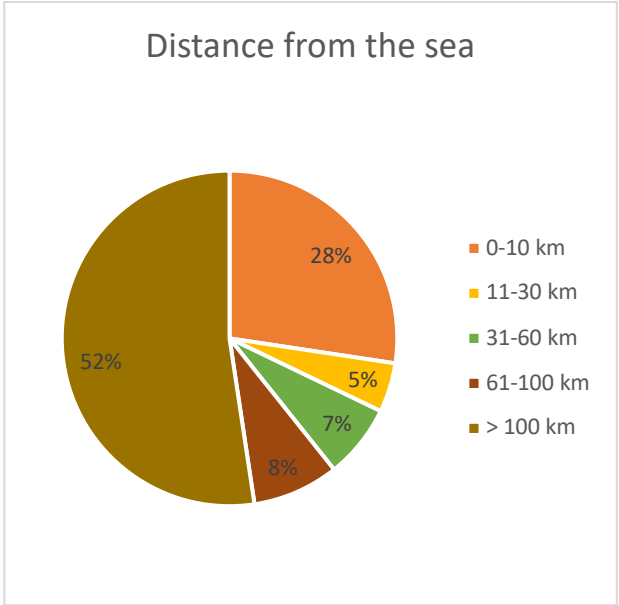




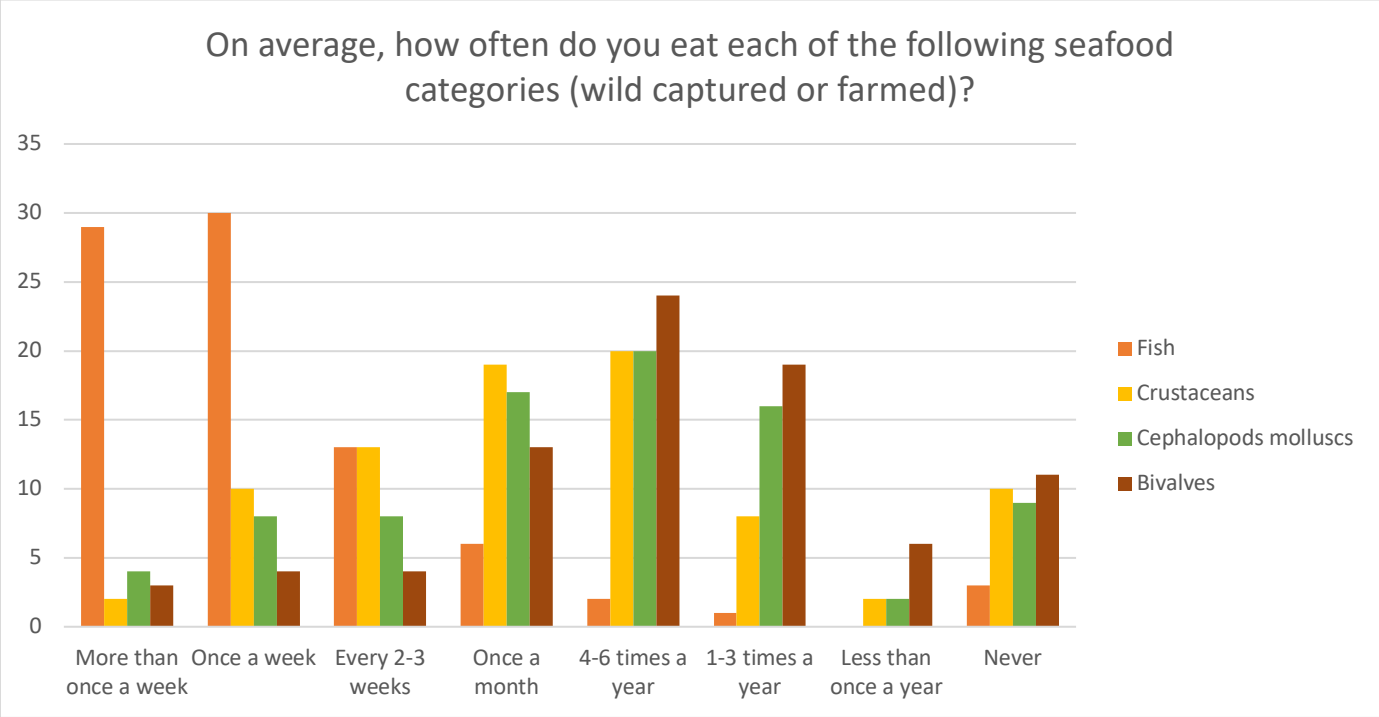


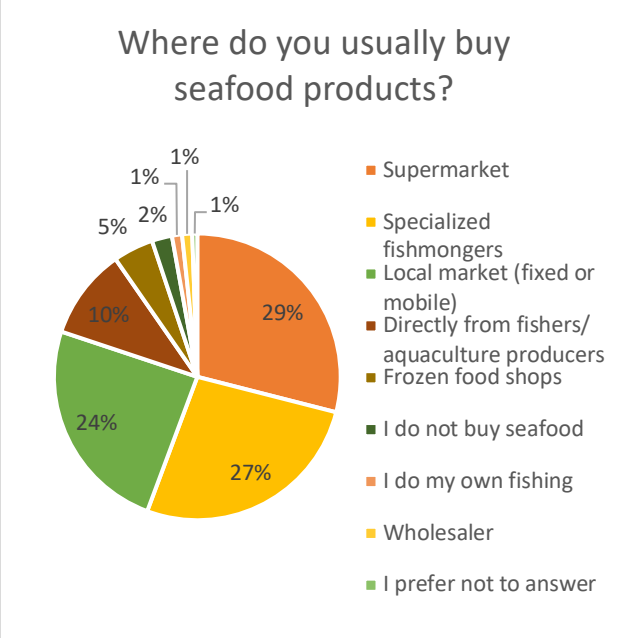


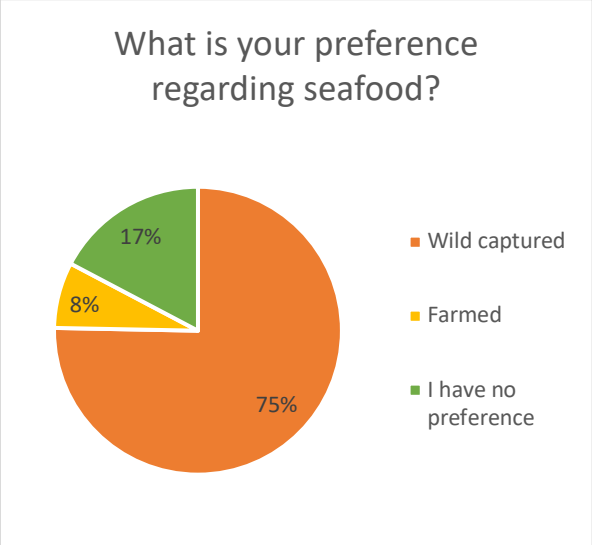


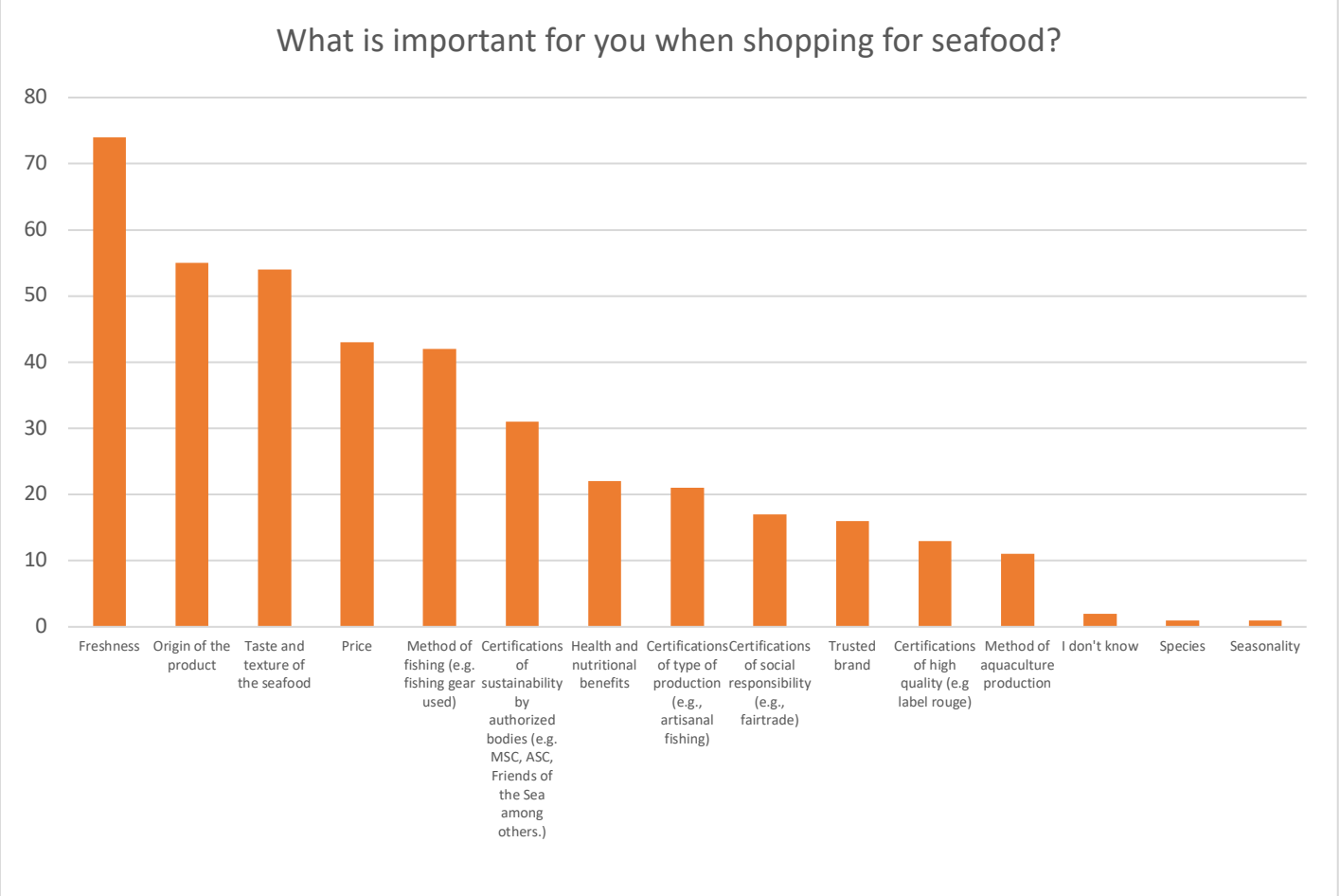


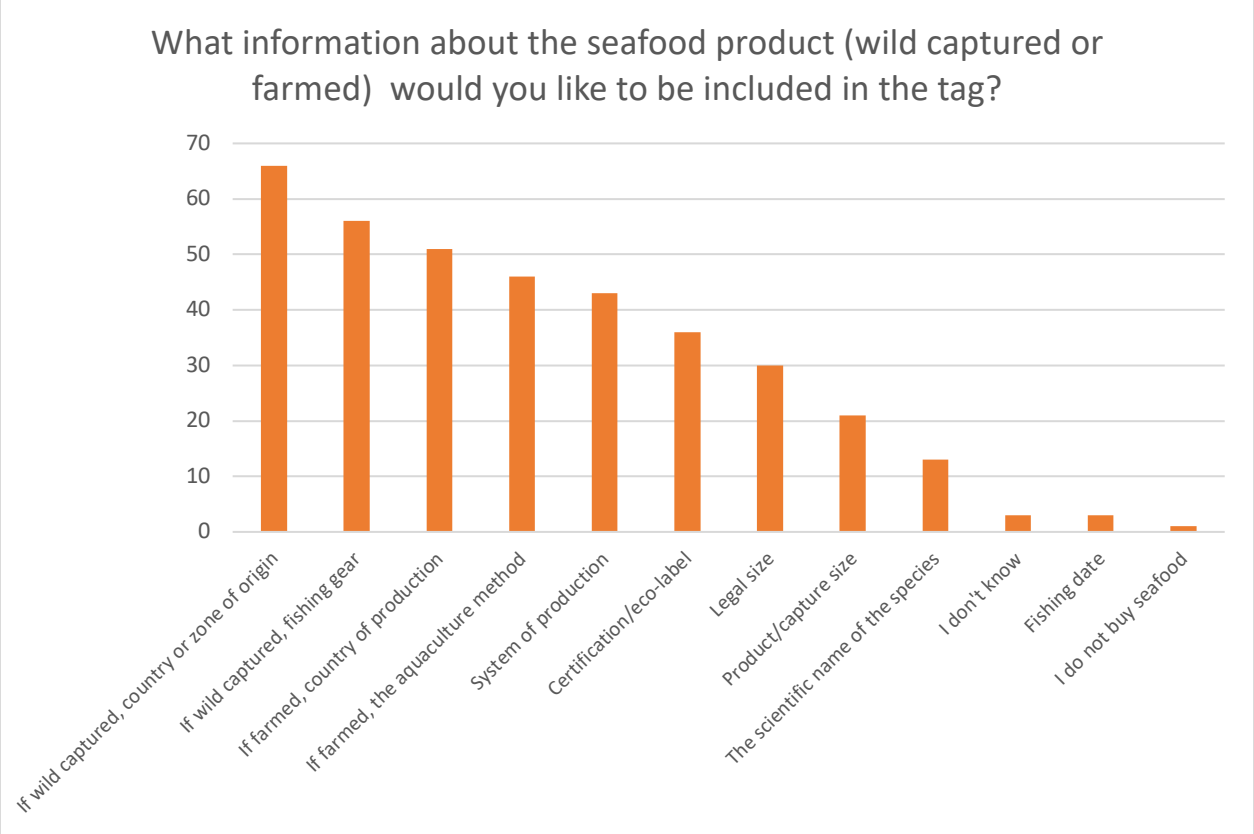
B - Purchasing habits – Main data

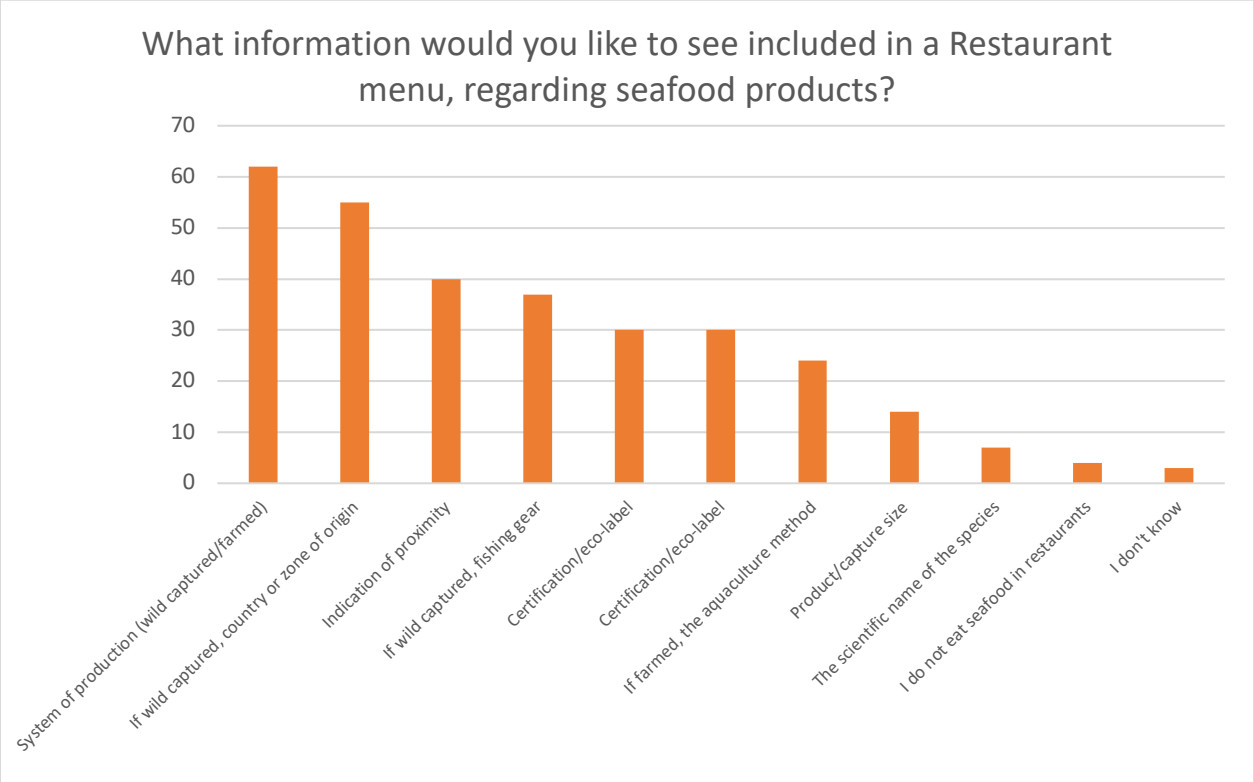



Where do you usually buy seafood products?
29%
27%
24%
10%
5%
2%
1%
1%
1%
Supermarket
Specialized fishmongers
Local market (fixed or mobile)
Directly from fishers/ aquaculture producers
Frozen food shops
I do not buy seafood
I do my own fishing
Wholesaler
I prefer not to answer

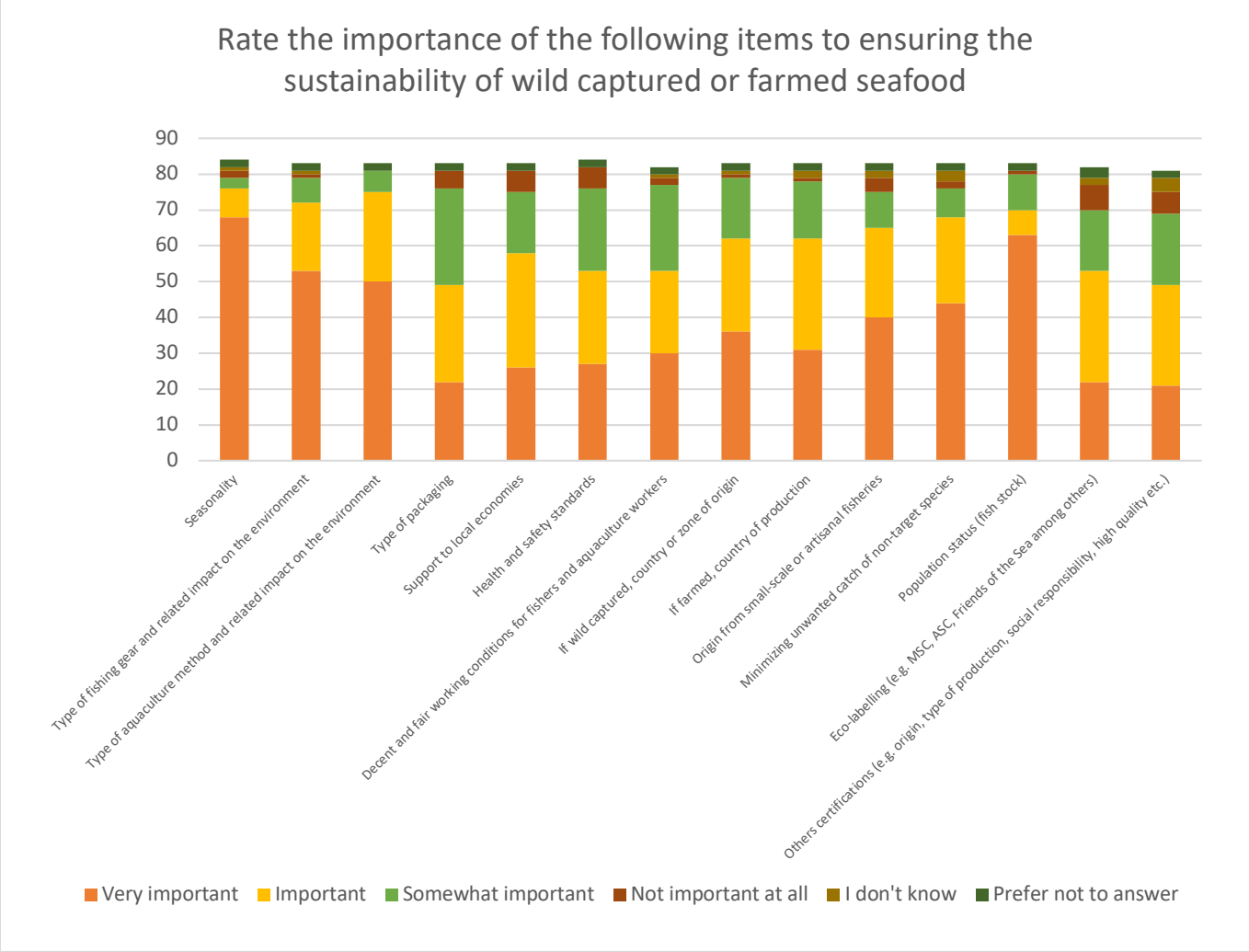

What is your preference regarding seafood?
75%
8%
17%
Wild captured
Farmed
I have no preference


What is important for you when shopping for seafood?
80
70
60
50
40
30
20
10
0
Freshness
Origin of the product
Taste and texture of the seafood
Price
Method of fishing (e.g. fishing gear used)
Certifications of sustainability by authorized bodies (e.g. MSC, ASC, Friends of the Sea among others.)
Health and nutritional benefits
Certifications of type of production (e.g., artisanal fishing)
Certifications of social responsibility (e.g., fairtrade)
Trusted brand
Certifications of high quality (e.g label rouge)
Method of aquaculture production
I don't know
Species
Seasonality


What information about the seafood product (wild captured or farmed) would you like to be included in the tag?
70
60
50
40
30
20
10
0
If wild captured, country or zone of origin
If wild captured, fishing gear
If farmed, country of production
If farmed, the aquaculture method
System of production
Certification/eco-label
Legal size
Product/capture size
The scientific name of the species
I don't know
Fishing date
I do not buy seafood


What information would you like to see included in a Restaurant menu, regarding seafood products?
70
60
50
40
30
20
10
0
System of production (wild captured/farmed)
If wild captured, country or zone of origin
Indication of proximity
If wild captured, fishing gear
Certification/eco-label
Certification/eco-label
If farmed, the aquaculture method
Product/capture size
The scientific name of the species
I do not eat seafood in restaurants
I don't know

C – Behavior toward sustainability – Main data



9.3.2 GREECE REPORT

COLLECTIVE INTELLIGENCE PROCESS AND REPORT SECTIONS

WP2 GREEK WORKSHOP REPORT

JUNE 2023

ATHENS, GREECE

NAYS Team

Ioanna Argyrou

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ONLINE BARRIER GENERATION

Barrier generation took place mainly online, via an online survey (questionnaire) in different languages, which was developed by SUBMON with the support of Ethic Ocean (EO).

The questionnaire addressed to consumers and explored their difficulties in identifying sustainable seafood products and making informed decisions, when purchasing or consuming farmed or caught seafood.

The results of this research, complemented by activities during 1-day consultation workshops that took place in Portugal, Spain, Greece and France will be used to develop consumer support actions regarding the purchase and consumption of seafood products, while strengthening their confidence.

A summary of the data collected **by the Greek survey** are shown below.

- Nº of respondents → 81
- Nº. of barriers collected. → about 167 barriers collected
- A short summary of data analysis (demographic data, purchasing habits, behavior toward sustainability) *(350 words)*

As shown in the charts below most of the replies received were between the ages 36-49 (44.83%) followed by the ages of 50-64 (33.33%). Most of the respondents identified themselves as just consumers (48.26 %) although it should be noted that public administration workers (10.34%) and scientists/academics (11.49%) were also represented in the results.

Regarding the sex of the respondents 51.72% were male and 47.13% were female.

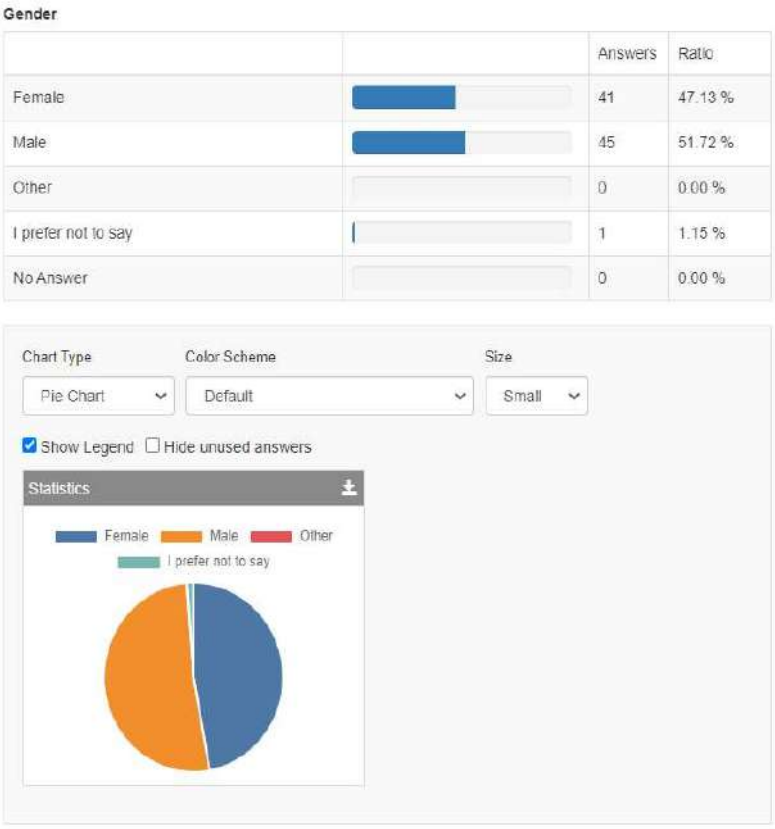


Figure 1: Gender

Age:

		Answers	Ratio
<20		1	1.15 %
20-35		13	14.94 %
36-49		39	44.83 %
50-64		29	33.33 %
>65		5	5.75 %
I prefer not to say		0	0.00 %
No Answer		0	0.00 %

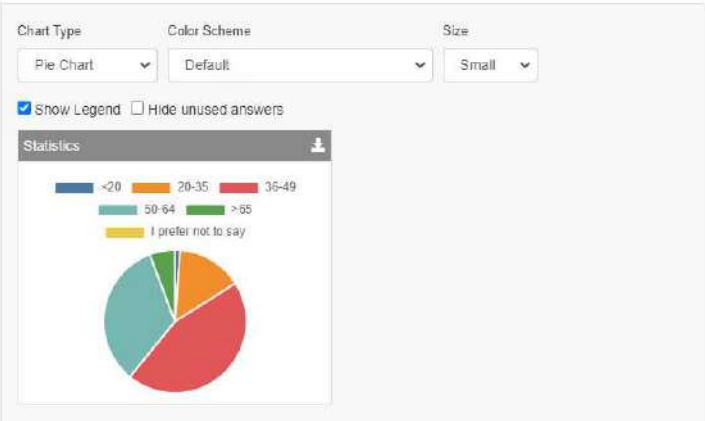


Figure 2: Age

In which category do you identify the most?

		Answers	Ratio
Chef / cook		0	0.00 %
Restaurant owner		0	0.00 %
Food blogger		0	0.00 %
Supermarket employee		0	0.00 %
Seafood producer		5	5.75 %
Representative of a packaging company		0	0.00 %
Member of NGOs		1	1.15 %
Public administration worker		9	10.34 %
Media		1	1.15 %
Academia/ scientist		10	11.49 %
Policymaker		0	0.00 %
Environmental consultant		3	3.45 %
Member of intergovernmental organizations		0	0.00 %
Canteen employee		0	0.00 %
Student		4	4.60 %
Market owner		0	0.00 %
Food retailer		0	0.00 %
Fish auction buyer		2	2.30 %

Figure 3: Identification of consumers

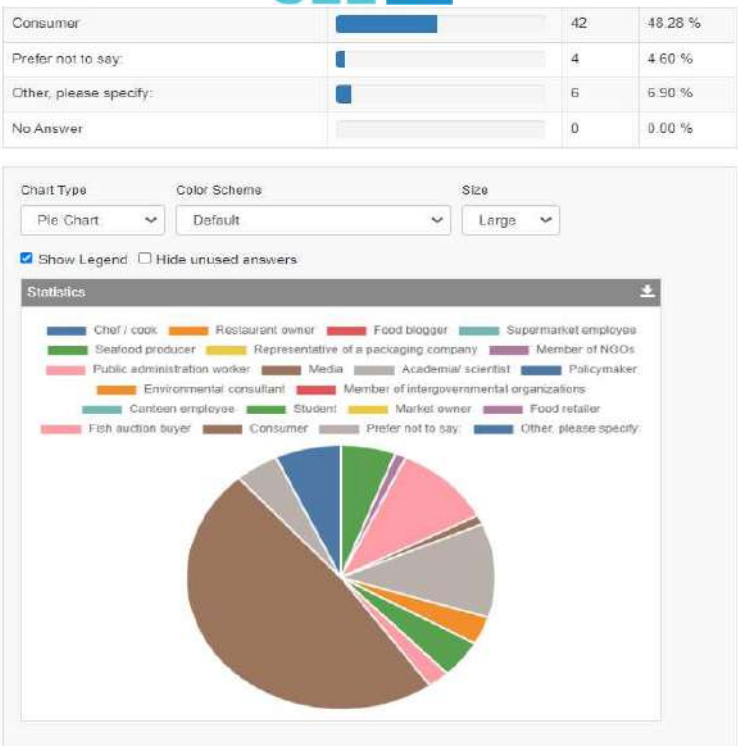


Figure 4: Identification of consumers

The purchasing habits include mainly consumers buying from:

- *the SUPERMARKETS (60.92%),*
- *the SPECIALIZED FISHMONGERS (57.47%) and*
- *the LOCAL MARKETS (42.53%).*

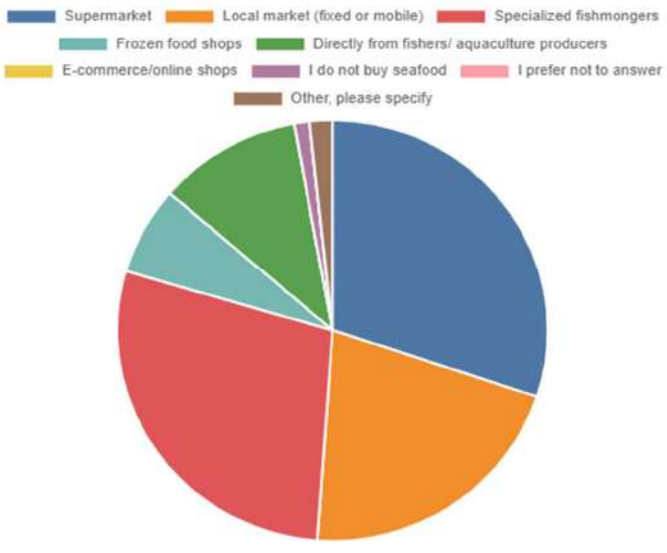


Figure 5: Purchasing Habits pie-chart.

As far as the consumption of the seafood products, most of the respondents (44.83%) eat FISH once a week and CRUSTACEANS and CEPHALOPODS/ MOLLUSCS once a month (26.44% & 31.03%). 24.14% of the respondents never eat BIVALVES.

Furthermore, according to the survey, most of the respondents prefer WILD CAPTURED (49.43%) seafood, followed by a 27.59% of them with NO PREFERENCE.

The most important elements when shopping seafood for the respondents of the Greek survey, are:

- FRESHNESS (86.21%),
- HEALTH AND NUTRITIONAL BENEFITS (60.92%),
- TASTE AND TEXTURE OF THE SEAFOOD (51.72%),
- PRICE (51.72%) and
- ORIGIN OF THE PRODUCT (50.57%).

On the subject of "behavior towards sustainability", the most important items (answered under the field VERY IMPORTANT) are:

- Seasonality (78.16%)
- Health and safety standards (73.56%)
- Type of fishing gear and related impact on the environment (57.47%)
- Minimizing unwanted catch of non-target species (57.47%)
- Population status (fish stock) (56.32%)
- Type of aquaculture method and related impact on the environment (51.72%)
- Support to local economies (51.72%)
- Decent and fair working conditions for fishers and aquaculture workers (49.43%)
- If wild captured, country or zone of origin (48.28%)
- If farmed, country of production (43.68%)

BARRIER CATEGORIZATION

- Composition of the Internal Working Group (number of members and profiles)

  The Internal Working Group of NAYS consisted of 5 persons:
  - Ioanna Argyrou → CEO & Founder of NAYS, Biologist/ Ichthyologist (M. Sc), Facilitator of the workshop.
  - Aikaterini Iordanidou → Head of Studies' Department, Chemical Engineer (M. Sc), Co-facilitator.
  - Marilena Balatsa → Secretarial Support, Philologist, Co-facilitator.
  - Theonia Kollia → Head of Administration, Project Management, Agroeconomist (M. Sc), Assistant.
  - Christos Gkizas → Studies' Department, Ichthyologist, Co-assistant.

  All members of the Internal Working Group successfully collaborated for the processing of the survey results, the necessary stages for the collation of all the questionnaires in order to export the barriers based on the answers given and all the procedures for the preparation of the 1-day multi-stakeholder workshop. Administrative actions such as preparation of the list of participants and the invitations to be sent were also carried out collectively.

- The final list of Categories and Barriers to be used at the 1-day multi-stakeholder workshop.

  The final list consisted of 7 categories with 4-7 barriers in each category.
  The total number of barriers that were introduced by NAYS team to the participants of the workshop, was 37.

Nr	BARRIERS	CATEGORY
1	Absence of substantial government controls in fisheries & aquaculture value chains from production to the selling points	LACK OF A STRONG LEGISLATIVE FRAMEWORK
2	Inability of support to the fishermen by the state and the EU, so that the fishermen remain in their place	
3	Absence of a Serious Fishing Policy from the EU to the Local Government Organizations	
4	Failure of state to manage the situation and fishing grounds	
5	Lack of certification control for authenticity/ traceability	
6	Absence of responsibility of the producer and trader	LACK OF CONSUMERS' CONFIDENCE
7	Absence of consumer confidence in the control mechanisms	
8	Failure to implement transparency along the value chain	
9	Demand only for Greek products	
10	Prejudice and consumer hostility towards fish farming	
11	Absence of freshness of the product	
12	Lack of quality indicators	
13	Absence / Unwillingness to indicate the true origin of seafood in fish shops	LACK OF INFORMATION ON THE LABEL
14	Lack of sufficient information on the label	
15	Tampering / Consumer fraud with the genetic tag	
16	Reluctance of the public to be informed and to know	
17	Lack of consumer knowledge	INSUFFICIENCY OF PROPER UPDATE / INFORMATION
18	Lack of correct / detailed information on quality and benefits of seafood consumption	
19	Lack of traceability and information about wild caught or farmed seafood	
20	Lack of education and awareness of aquaculture farmers and fishermen on the importance of sustainable aquaculture & fisheries	
21	Lack of information to consumers regarding aquaculture	
22	Weakness / Inadequacy of informing the consumer public on the breeding method, fishing of the species & achieving sustainable consumption	
23	Failure to integrate the Greek workforce in the aquaculture sector	
24	Ecosystem disasters	ECOSYSTEM IMPACTS
25	Demand for undersized and prohibited species	
26	Absence of information on seasonality of species, reproduction, species & sizes prohibited for fishing, disposal, trade & consumption	
27	Insufficiency of fish stocks	
28	Financial factors/ High Cost	FINANCIAL REASONS
29	Conflict of price - quality	
30	Demand for consumption of other species from developed countries	
31	Absence of price control	
32	Selective availability at certain stores	
33	Lack of time for shopping and cooking	
34	Conflict of interests of tourism sector and aquaculture	CONFLICT OF INTERESTS
35	Conflict of interest in aquaculture and fisheries	
36	Conflict between the interests of the consumer and the producer	
37	Reluctance of aquaculture farmers to invest in the development of local communities/ Reluctance of agencies to cooperate	

Please note that the above list was changed when introduced to the one-day multistakeholder workshop. During the participatory process, some barriers were split into two separate categories, some were assigned to a different category and new barriers were also introduced. The final list of barriers **(44 barriers in total)** per category is presented below (the barriers that were split or moved to other categories were not assigned a new number, for them to be easily tracked by the Internal Working Group. In red letters in the left column, you can see the split/moved/new barriers:

Nr	BARRIER	CATEGORY
1	Absence of substantial government controls in fisheries & aquaculture value chains from production to the selling points	LACK OF A STRONG LEGISLATIVE FRAMEWORK
2	Inability of support to the fishermen by the state and the EU, so that the fishermen remain in their place	FINANCIAL REASONS
3	Absence of a Serious Fishing Policy from the EU to the Local Government Organizations	LACK OF A STRONG LEGISLATIVE FRAMEWORK
4	Failure of state to manage the situation and fishing grounds	
5	Lack of certification control for authenticity/ traceability	
6	Absence of responsibility of the producer and trader	LACK OF CONFIDENCE OF CONSUMERS
7	Absence of consumer confidence in the control mechanisms	
8	Failure to implement transparency along the value chain	
9	Demand only for Greek products	
10	Prejudice and consumer hostility towards fish farming	
11	Absence of freshness of the product	
12	Lack of quality indicators	
13	Absence / Unwillingness to indicate the true origin of seafood in fish shops	LACK OF INFORMATION ON THE LABEL
14	Lack of sufficient information on the label	
15	Tampering with the genetic tag	
16	Reluctance of the public to be informed and to know	INSUFFICIENCY OF PROPER UPDATE / INFORMATION
17	Lack of consumer knowledge	
18	Lack of correct / detailed information on quality and benefits of seafood consumption	
19	Lack of traceability and information about wild caught or farmed seafood	
20	Lack of education and awareness of aquaculture farmers and fishermen on the importance of sustainable aquaculture & fisheries	
21	Lack of information to consumers regarding aquaculture	
22	Weakness / Inadequacy of informing the consumer public on the breeding method, fishing of the species & achieving sustainable consumption	
23	Failure to integrate the Greek workforce in the aquaculture sector	FINANCIAL REASONS
24	Ecosystem disasters	ECOSYSTEM IMPACTS
25	Demand for undersized and prohibited species	
26	Absence of information on seasonality of species, reproduction, species & sizes prohibited for fishing, disposal, trade & consumption	
27	Insufficiency of fish stocks	
28	Financial factors/ High Cost	FINANCIAL REASONS
29	Conflict of price - quality	
30	Demand for consumption of other species from developed countries	
31	Absence of price control	
32	Selective availability at certain stores	
33	Lack of time for shopping and cooking	
34	Conflict of interests of tourism sector and local communities with aquaculture	CONFLICT OF INTERESTS
35	Conflict of interests of tourism sector and aquaculture	
36	Conflict between the interests of the consumer and the producer	
37	Reluctance of aquaculture farmers to invest in the development of local communities/	
38	Lack of state and EU support to the fishermen for them to be able to work locally (where they live)	LACK OF A STRONG LEGISLATIVE FRAMEWORK
39	Conflict of interet between professional and amateur fishermen	CONFLICT OF INTERESTS
40	Consumer fraud with the genetic tag	LACK OF CONFIDENCE OF CONSUMERS
41	Reluctance of agencies to cooperate	CONFLICT OF INTERESTS
42	Absence of strategic marketing	INSUFFICIENCY OF PROPER UPDATE / INFORMATION
43	Absence of control of the implementation of the Legislative framework	LACK OF A STRONG LEGISLATIVE FRAMEWORK
44	Lack of renewal of the spatial planning framework for aquaculture farms	

1-DAY MULTI-STAKEHOLDER WORKSHOP

- Date → The workshop was held on 12th of
- May 2023.
- Location → The venue chosen for the workshop was located in Plaka, in the center of Athens (Greece).
- Information on the attendees (number, stakeholder groups, profiles etc.)

The total number of attendees of the workshop was 19 individuals, emerging from various groups of the value chains of fisheries and aquaculture. The main groups that were represented within the workshop were administration and governance – including several executives representing the fisheries' regional departments and the central administration, consumers with a wide range of backgrounds – scientists, economists, engineers, IT specialists etc. and aquaculture producers. Age range of the participants was roughly 28-70 and the male/female ratio was 8/11.

- A summary of the discussion around the second stage of barrier generation and categorization *(350 words)*

After being presented with the list of barriers that had also been sent via email to the participants some days before, the participants engaged in discussions, reconsidered the categories and the related barriers and some of them had already come up with proposed changes. A fruitful discussion was raised for some barriers to be moved to another category or split into 2 categories, which was more popular. Also, new barriers were introduced as a result of this process. Finally, through these steps that were facilitated by NAYS team, **the barriers reached up to 44,** regarding the 7 categories initially created. The feedback from the audience on this procedure was quite encouraging, as they were able to retrieve important knowledge from each other and find common grounds. The DEPARTMENT FOR COMMON FISHERIES POLICY & COMMON MARKET ORGANIZATION representative, who participated in the workshop, had a very important contribution, as he explained to the audience many details about the fisheries and aquaculture value chain functions, making matters for consumers significantly easier to understand. Also important was the contribution of the officials of the Directorate of Agricultural Affairs of the Decentralized Administration of Attica, who added to the proposed barriers, a new dimension related to the issue of the existence of a spatial framework for the installation of aquaculture units, which according to the discussions held, is also a factor of great importance in terms of the consumer's perception towards the final product and the opinion they form on the aquaculture industry. A new barrier was added to the list, due to this contribution, which also appeared in the final graph produced by ISM software.

- A summary of the process of voting for the most relevant barriers (350 words)

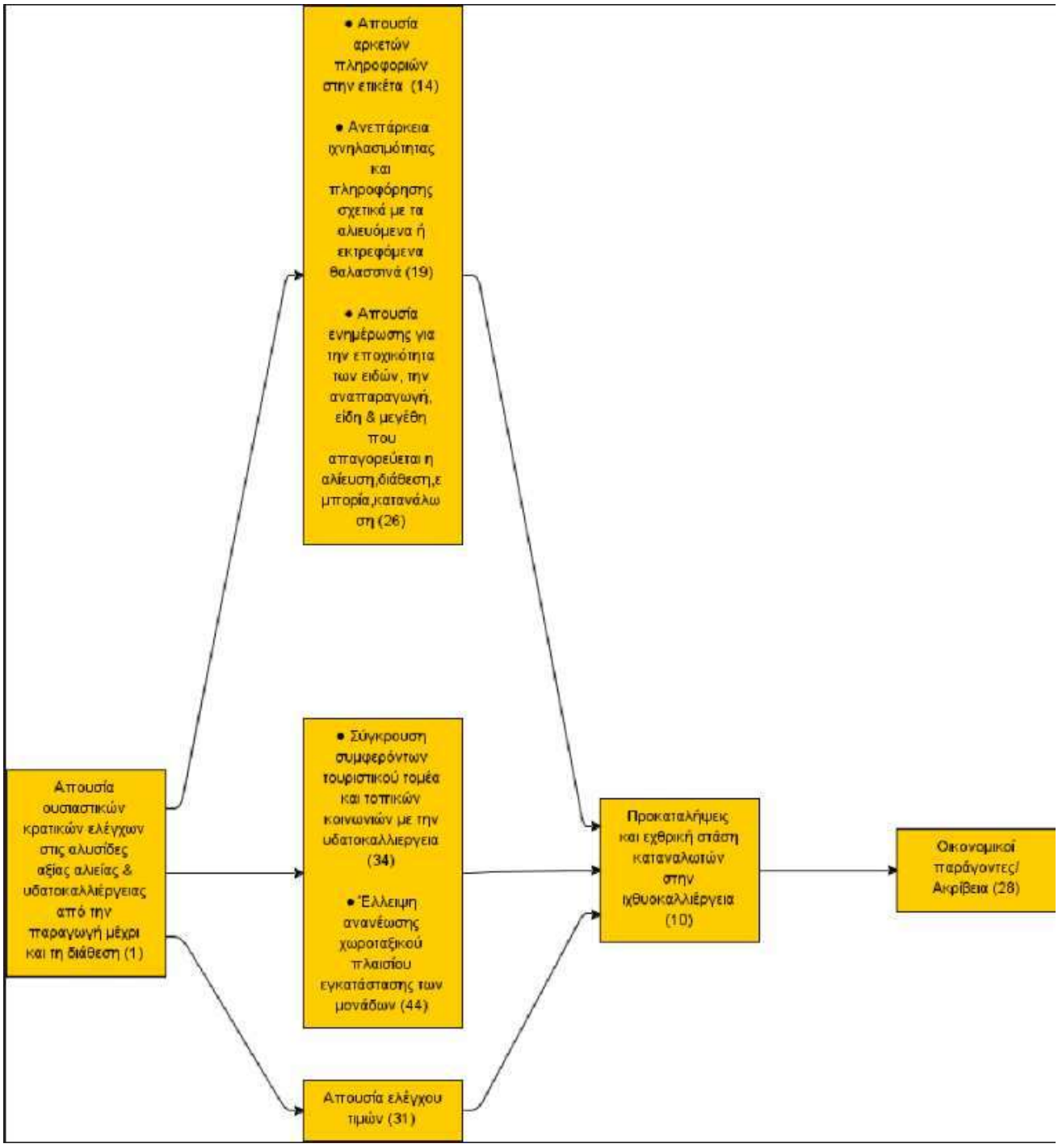
Following the second stage of barrier generation and categorization, participants were called upon to vote with placing red stickers on the barriers that they believed were of most importance. This activity was very interesting for the participants and sparked a lot of conversation between them, as well as with the NAYS team. The facilitator remained neutral during the whole process. The facilitator and co-facilitators extensively explained the rules of this procedure and the precision required, that is why we gave the audience the proper time to comprehend the listed barriers for the votes to be as representative as possible. NAYS team made sure everybody voted in both sub-stages of the vote, even though the coffee break was in progress.
After that, the Internal Working Group had to enter the votes into an excel file, from where they were sorted in descending order and then the most popular barriers (from 10 votes and above) were collected to be entered into the ISM software. Next, **the 9 top voted barriers** were moved into the structuring field in the ISM software, to continue with the pre-structuring voting. During these actions, the audience had the chance to have lunch and engage in social networking. After lunch, NAYS team gathered the participants and explained in detail the ISM voting procedure. The participants showed great interest in this stage and during the first 5-6 questions they engaged in lengthy discussions with each other regarding the connection of the barriers in each side of the question "Does barrier A aggravate the Barrier B"? NAYS made significant efforts to keep the discussion in short lengths in order to not to be thrown off time frame. The vote was smooth and the

discussion between was targeted enough for the software to reach a conclusion in 35-40 minutes, resulting in the below map of barriers.

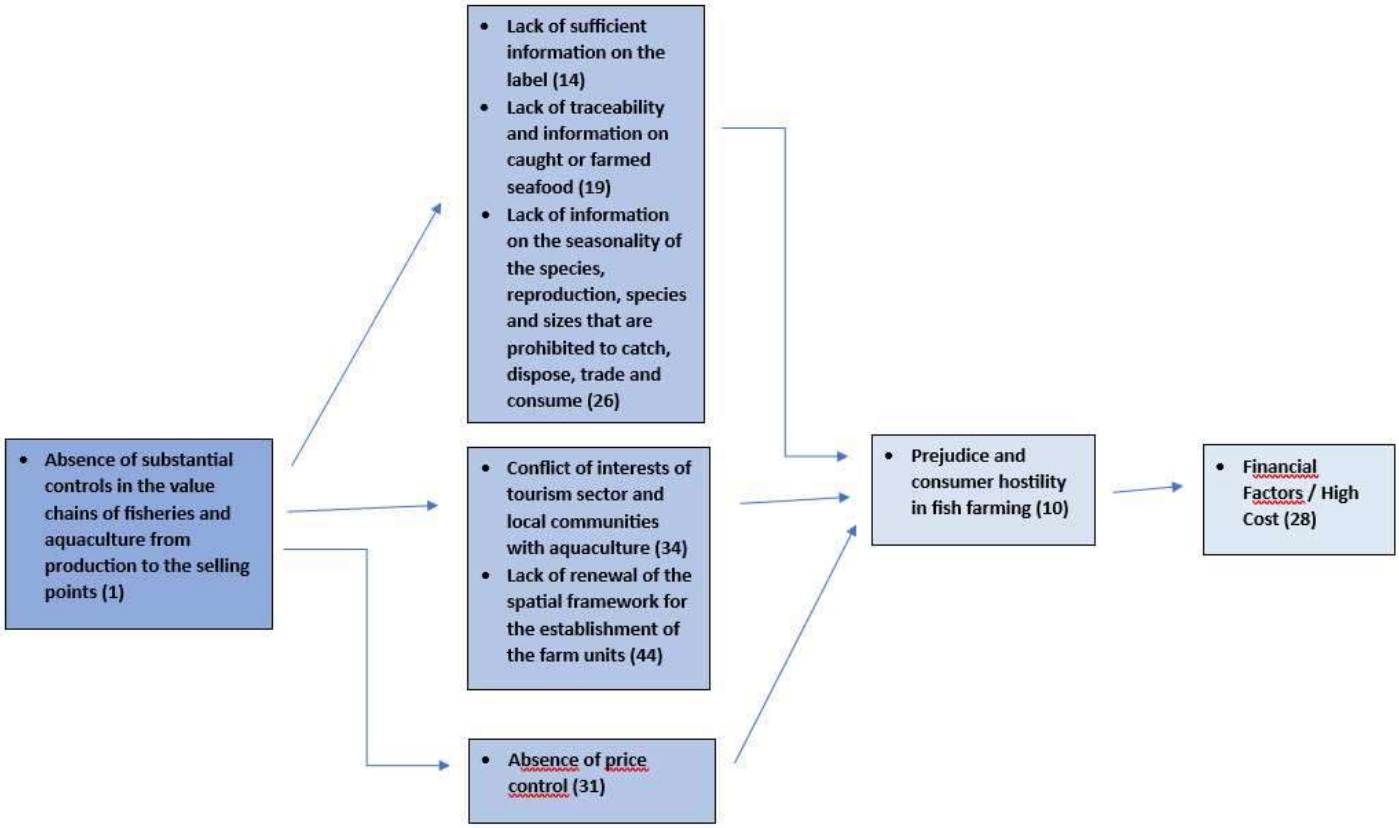
BARRIER STRUCTURING

- Map of barriers (jpg file)

PRODUCED BY THE ISM SOFTWARE (IN GREEK):



TRANSLATED IN ENGLISH FOR THE SCOPE OF THE REPORT



- Short description of the map of barriers and discussion within the workshop (350 words)

The graph that was generated by the ISM software drew the interest of the participants as it matched the participants' opinion of the problems responsible for the consumers' difficulties towards the purchase and consumption of sustainable seafood products.

Moreover, they understood how their voting was visualized and were impressed by the software itself. The facilitator explained the rationale of the graph, meaning that it is read from left to right, with the barriers in the left having the most aggravation. A very interesting, vivid conversation was raised on the significance of some of the barriers and their relative gravity, such as prejudice towards aquaculture, which is a common problem and situation faced by the sector in Greece, especially considering the importance of tourism and the conflict of interests with local communities and consumer groups in general. A large part of the discussion was about the fact that the lack of a stable, strong spatial framework for the establishment of aquaculture farms significantly affects the opinion formed by the general public. There seems to be a strong correlation between the existence of an organized spatial framework for the establishment of aquaculture farms and the creation of synergies with other sectors in the coastal zone, such as tourism, and this, at the end, has an impact on the public's experiences in relation to the sector, therefore affecting their opinions. Fishing communities also have a lot to gain from these synergies as fishing tourism is an activity with significant potential in Greece, however fishermen are a special group with distinct characteristics. Regarding the information on the product label, the representatives of the aquaculture industry emphasized that the product leaves the facility with a full label, in accordance with the strict quality standards that must be followed in order for them to be able to export their product. However, due to the complexity of the value chain and the many intermediaries, this information ultimately does not reach the consumer in its entirety (or at all), which contributes to the uncertainty with which the industry is faced, as well as certain prejudices developed by the public.

GENERATING OPTIONS

- List of solutions for each barrier category

The list of solutions resulting from the option generating stage of the workshop is listed below. The options are presented in order of number of votes, in total from both voting procedures carried out in the workshop.

Nbr	CATEGORY	PROPOSED SOLUTIONS
1	1 LACK OF A STRONG LEGISLATIVE FRAMEWORK	There are often political reasons that lead to inexistent application of the current legislative framework on controls for the traceability of fishery products (Regulation 404/2011). These are controls carried out at the source (boat, loading ports) by inspectors - Icthyologists, throughout Greece. The legal framework for the Board of Inspectors to function has not been drawn up. This has to be combined with administrative actions towards the creation of a system/platform to record all the sale points to facilitate controls.
6	3 LACK OF INFORMATION ON THE LABEL	Encourage policies to be applied by the competent authorities (e.g. Ministry of Rural Development and Food, regional authorities) in order to motivate producers to effectively apply and also to continue applying actions related to the completeness of the information on the product label, without it being altered or changed along the value chain: data on the fishing area, fishing season and the species' common name which is usually what the consumers are familiar with, date and size of harvest as well as the product's nutritional value and nutrient information.
4	2 LACK OF CONFIDENCE OF CONSUMERS	Re-orientation of the existing educational system towards providing **basic education** on the importance of the fishing and aquaculture sector for the country, the product of the sector as an exportable good as well as its nutritional value. This will have a cascading effect towards reshaping the communities' opinions on aquaculture and its supplementality with the fishery sector *(COMMENT:currently there is no official informative framework from the state, on the contribution of fishery products to food security and their nutritional value)*
14	6 FINANCIAL REASONS	Create a special platform (observatory) solely for fishery and aquaculture products, following the paradigm of fuel prices control platform, that will also be supervised by the Ministry of Development where the prices of catches will be listed in order for the prices to be controlled through the demand, as the consumer will be able to compare the prices.
9	4 INSUFFICIENCY OF PROPER UPDATE / INFORMATION	Design and implementation of active consumer information strategies so that the consumers know what to look for and what information to require/demand when purchasing fishery products.
12	5 ECOSYSTEM IMPACTS	Creation and distribution by the media, social networks, services of the Ministry of Rural Development and Food as well as the Ministry of Development and also at the school/educational level (Ministry of Education), of informational material (e.g. brochures, special classes, webinars, workshops, presentations at schools, educational visits) with the required information about the seasonality of the species and its importance for the sustainable consumption of fishery products.
13	5 ECOSYSTEM IMPACTS	Developing measures prohibiting the free and uncontrolable mooring of boats in areas with posidonia meadows, which constitute a protected habitat, to more effectively limit the impacts of tourism on the marine ecosystem, for which aquaculture is basically blamed - smoothing out contrasts in relation to the procedures followed for tourism which are generally smoother and quicker. These measures can be developed and applied in cooperation with Navy General Staff will have an important impact on environmental preservation of protected marine habitats.
5	2 LACK OF CONFIDENCE OF CONSUMERS	Create a barcode/ QR code that will be easy and fast to the consumer to "read" all the basic and more important info for the entire value chain
21	7 CONFLICT OF INTERESTS	Reforming the institutional framework for the licensing of touristic units with more complex procedures so that there is no strong inequality with aquaculture, which is a form of environmentally friendly activity.
3	1 LACK OF A STRONG LEGISLATIVE FRAMEWORK	Re - orientation of scientific and academic efforts as well as administrative actions for the formulation of licensing procedures, towards the development of innovative installation and inspection systems for the farms, suitable for the open sea, in view of the climate change that will drive the farms away from the coastal zone in the near future.
16	6 FINANCIAL REASONS	Plan and conduct state financial support for the development of the fishing industry and/or its continuation by the younger generations at the local level and in combination with other business actions (e.g. tourism) in order to be easier and encouraging to remain at their place of residence, especially reffering to small islands and villages.
7	3 LACK OF INFORMATION ON THE LABEL	Establishment of regular and unannounced controls at the points were fishermen land their catch.
11	4 INSUFFICIENCY OF PROPER UPDATE / INFORMATION	Set up Synergies and programmes between the State (Ministry of Rural Development & Ministry of Education) and the aquaculture producers to create educational summer camps at aquaculture farms, in which children and youngsters will come across all the stages of aquaculture farming up to the point of distribution and be fully briefed.

17	**7 CONFLICT OF INTERESTS**	Creation of synergies and promotion of good practices, in order to form growth poles from the combination of aquaculture with tourism (fishing tourism, ecotourism).
18	**7 CONFLICT OF INTERESTS**	Initiatives on creating compensatory benefits offered to the local communities through the leases for marine areas and employment opportunities.
20	**7 CONFLICT OF INTERESTS**	Building strategies towards the inclusion of aquaculture in the touristic product of the region - establishment of combined actions, e.g. organizing and promoting educational and recreational visits to aquaculture farms.
22	**7 CONFLICT OF INTERESTS**	Adjustment of the state's promotional policy towards aquaculture by creating incentives, e.g. for the lease of lagoons for aquaculture activities that are more traditional and closer to rural life and experiences.
15	**6 FINANCIAL REASONS**	Plan and conduct a lower taxation policy for the fishermen, especially reffering to small islands and regions.
10	**4 INSUFFICIENCY OF PROPER UPDATE / INFORMATION**	Conduct of a more targeted marketing policy (e.g. campaigns) for a more wholesome informative experience on the sustainability in general and its application in seafood consumption in particular.
2	**1 LACK OF A STRONG LEGISLATIVE FRAMEWORK**	Acceleration of the renewal of the spatial planning framework for aquaculture.
8	**3 LACK OF INFORMATION ON THE LABEL**	Development and establishment of an instant registration system of the sales of the fish by the fishermen to the fish auctions and/or fish mongers at the exact moment.
19	**7 CONFLICT OF INTERESTS**	Local community education actions, mobilization of key influential people (not elected rulers) to change the mindset towards aquaculture and the possibilities it offers.
	***COMMENT (options 6, 9, 12, 13)** : These barriers in the graph produced by the ISM software were reciprocally inter-related.*	
	***COMMENT (option 4/category 2)** : A typical example was given by an official of the Decentralized Administration dealing with the licensing of aquaculture units, as follows: 20-30 years before, in Greece, the profession of a veterinarian was mainly associated with the care of farm animals and rural work. Today this profession is much more appreciated as their focus is not limited to pets and farm animals but also to aquaculture where his role is particularly important. This is a very good example of a change in attitude towards animals, their welfare and also professions that were considered less prestigious, which is a very encouraging factor to be taken into account when considering progress and a change in attitude towards the aquaculture industry, that can be fostered through the basic levels of education.*	
	***COMMENT (category 7):** Such actions will have a special weight in the areas of organized aquaculture development, eg Evia, Thesprotia, etc. or even areas with touristic character e.g. Paros.* *It should be noted that Fishing Tourism is currently only locally based and organized, when just recently the Ministry of Tourism and the Ministry of Rural Development and Food signed a cooperation memorandum to promote fishing tourism on a more centralized level.* *Regarding the option on education actions, these are measures that, in the long run, could also help face other challenges under different categories, such as "Prejudice and consumer hostility in fish farming".*	

- A summary of the process of voting for the “SMARTEST” options (350 words)

The 19 workshop participants were divided into 4 groups out of which one group consisted of 4 people and the remaining 3 consisted of 4 people each. We made sure that each group had sufficient representation both from public authorities who offered their knowledge and experience in administrative and institutional processes, as well as from the industry and consumers. The groups were left for about 15 minutes to discuss within their team and propose a set of solutions per group, as follows: the group of 4 participants was asked to present solutions for 1 category of barriers - namely Category 7, while the other groups took it upon themselves to present solutions, each for 2 categories. The discussion progressed smoothly and resulted in the above table, where the proposed solutions regarding the barriers to the sustainable consumption of fishery products are presented. Then, all the participants were invited to vote firstly, one solution for each category they considered most important and then in a second vote, the most important overall solutions to the barriers presented in the workshop, having previously analyzed the graph resulting from the software.

- Please also attach the ism software file (rename it as "country_Sea2See_seafood_barriers)

  The GREECE_Sea2See_seafood_barriers file is digitally attached to the current report.

RESULTS OF THE STAKEHOLDER MAPPING EXERCISE

- A short summary of the exercise and the delivery of the exercise

Unfortunately, due to the lack of time that was utilized for the stage of option generation, there was not sufficient time to proceed with this exercise.

Nays is planning to contact participants to discuss the already produced mapping of the identified stakeholders reported in the relevant deliverable.

OVERALL EVALUATION

- Did you find any difficulties in carrying out the workshop? If yes, how did you overcome them? (*350 words)*

NAYS Team was faced with a difficulty concerning the ISM Software and the limitation regarding the votes per participant: the software can take up to 5 votes per participant and for this reason it was necessary that the results were primarily entered into an excel file. Next, the voted barriers were categorized in ascending order, and we selected those that had been voted with 5 or more votes, so that we could proceed with the structuring. This was something we did not anticipate but we were able to tackle the problem without getting out of schedule.

Overall, it was a very educative experience for everyone involved as it demonstrated the possibilities offered by participatory processes in problem solving and strategy planning. The audience gave very good feedback, and it was a good opportunity for social networking, learning new things and finding common ground between different groups of stakeholders. The success of such initiatives not only relies on the level of preparation done a priori but also, on the diversity of the participants and the representation of as many stakeholder groups as possible. This in general could be planned better in a similar future event.

- What strengths would you like to point out about the workshop event? *(350 words)*
  - *Internal Working Group: the cohesion and collaboration level were satisfactory and the feedback from the audience was very positive. It was a good chance for NAYS to introduce itself and for the team to familiarize itself with key stakeholders.*
  - *The Collective Barrier Generation was a very interesting exercise for us to understand how people think, in relation to their background and/or administrative position. Also, it was very satisfying to see that the attendants exchanged opinions and even changed their minds when discussing with an attendant with a different background. The audience was very active and added more barriers.*
  - *The barrier structuring process and the question wording brought up a very fruitful conversation everyone at the workshop learned a lot from.*
  - *The audience/participants were engaged throughout the workshop, also were very resourceful.*

- Is there any other comment you want to add about the entire process? (*350 words)*

The workshop clearly illustrated the creative potential of conflicts in participatory design. The results were very indicative of the need to engage in of co-creation processes that involve every stakeholder, as it is crucial to achieve win-win situations, especially in complex cases like the one involving the different interests of tourism – fisheries – aquaculture and local communities. Greece, holding the 1st place in the ranking of countries with the longest coastline in the Mediterranean and the 11th place in the corresponding global ranking, means that the problem of bringing together

different players in the coastal zone is very real and complex. It is also known and accepted that, in order to achieve sustainability, it is considered necessary to organize the activities through spatial planning or mapping of collective spaces and foster harmonious coexistence with other activities of the coastal zone (tourism, industry, housing, environmentally protected areas, etc.), so that conflicts over spatial issues, which are usually a good basis for prejudices and predispositions of the community towards aquaculture, are minimized or even avoided. It has been made clear that different actors' agendas could be negotiated and conciliated to solve problems, rather than dominating the other players (win-lose situation), as the latter does not bring as many benefits to either side. The workshop raised awareness of the importance of taking part in understanding the problem and consequently, proposing options to tackle it. It also demonstrated that while applying pressure to producers to share data and info on their product, administrative willingness to act towards substantial changes in controlling that the legislative framework is being applied is a key aspect. Also, educational reforms targeted at the early stages of education (e.g., elementary school) are needed because people are not sufficiently familiar with fishery products, aquaculture, their significant contribution to food security and high nutritional value. Such participatory processes can bring up a lot of solutions towards sustainable development in general, if they are inclusive and different interests are adequately represented.

9.3.3 PORTUGAL REPORT

Collective Intelligence Process and Report Section

“Barriers to sustainable Seafood Consumption in Portugal”

Report: Multi-Stakeholder Workshop: "Barriers to Sustainable Seafood Consumption in Portugal"

June 2023

Contents: Associação Natureza Portugal in association with WWF

Review: CCMAR, University of Algarve; CESAM, University of Aveiro; SEAentia

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1. ONLINE BARRIER GENERATION

Sea2See Online Survey
Nº of respondents: 89
Nº of barriers collected: 242

1.1. A short summary of data analysis (demographic data, purchasing habits, behavior towards sustainability)

- From the 89 people who answered the online survey (Figure 1), 57% were women and 43% were men.
- Most respondents (53%) were between 20 and 35 years old, 27% between 36 and 49 years old, and 18% between 50 and 64 years old. Respondents over 65 years old only represented 2% of the sample.
- Regarding seafood consumption, 52% of respondents showed a preference for seafood products from fisheries, while 40% did not indicate any preference. Only 6% of the respondents reported preferring seafood products from aquaculture.
- Concerning the distance of the household from the coast, more than half of the respondents (61%) indicated living more than 10 km away from the sea, 21% between 11 and 30 km, 13% between 31 and 60 km, 3% between 61 and 100 km, and only 2% indicated living more than 100 km away from the coastline.
- With regards to the place/way to obtain seafood, the great majority of respondents (89%) indicated going to the supermarkets, 46% to local markets and 39% stated other options, such as buying online, buying from specific fishmongers or directly from fishermen, buying seafood in shops as frozen products, or even capturing their own fish.

Figure 1 - Dissemination post for the online survey (with QR code).

2. BARRIER CATEGORIZATION

2.1. Composition of the Internal Working Group (number of members and profiles)

Internal Working Group Date: May 2, 2023 Location: ANP|WWF Headquarters, in Lisbon

Before the Internal Working Group session developed to prepare the stakeholder workshop (Figure 2), the answers to the online survey containing more than one barrier were separated and duplicates were removed. During this session, which took place on the 2nd of May 2023, the barriers identified in the survey were categorized. There was also the need to group similar barriers, in order to decrease their number so the following steps of the methodology were easier to follow (the initial number of barriers was 242, these were grouped into 54 barriers after analyzing and interpreting each one of them). The grouping task was considered time consuming. For that reason, the team had to review the outcome afterward. The Internal Working Group session counted with the following participants:

- Cristina Pita - CESAM|UA
- Gisela Costa - CESAM|UA
- Mafalda Rangel - CCMAR
- Matilde Almodovar - ANP|WWF
- Nuno Leite - SEAentia
- Pedro Ramos - ANP|WWF
- Rita Sá - ANP|WWF
- Sofia Alexandre - CCMAR

Figure 2 - Internal Working Group session for categorization of the barriers.

2.2. The final list of Categories and Barriers with added input from the 1-day Multi-Stakeholder Workshop

The first stage of the participatory workshop was the review of previously categorized barriers. Throughout this phase, the barriers were analyzed one by one, generating several exchanges of ideas, which resulted in some changes to the initial categorization, namely with the addition of some new barriers (Table 1).

*Table 1 - Categories and Barriers that resulted from the Internal Working Group session and categories added during the Multi-Stakeholder Workshop (with *).*

Categories	Barriers
1. Product's quality, public health and animal welfare	1.1. Animal welfare
	1.2. Ethical issues
	1.3. Food safety
	1.4. Use of antibiotics in aquaculture
	1.5. Product's quality (from fisheries or aquaculture)
2. Sustainability and fisheries management	2.1. Fishing gear's impact
	2.2. Minimum catch size (MCS) and breeding season
	2.3. Bycatch
	2.4. Lack of regulation of fishing quotas
	2.5. Stock assessment
	2.6. Overfishing
	2.7. Ghost fishing
	2.8. Issues related to Marine Protected Areas (MPAs)*
3. Perception of aquaculture sustainability	3.1. Prejudice about aquaculture products
	3.2. Environmental impact of aquaculture
	3.3. Low quantity of aquaculture products
	3.4. Low diversity of species produced in aquaculture
4. Knowledge, access to information and awareness	4.1. Literacy on sustainable seafood and fish

Categories	Barriers
	consumption
	4.2. Literacy and awareness of actors across the seafood's value chain
	4.3. Awareness of a more diversified diet
	4.4. Literacy about aquaculture products
	4.5. Lack of information
	4.6. Inappropriate and unappealing dissemination
	4.7. Digital literacy*
	4.8. Culinary skills*
5. Traceability, certification and labeling	5.1. Traceability
	5.2. Environmental sustainability certification
	5.3. Lack of information and certification on seafood and fish origin
	5.4. Lack of information and certification of capture method
	5.5. Inappropriate and uninformative labels
	5.6 Difficulty in interpreting the labels*
6. Support for the economy of local/national seafood and fish products	6.1. Promotion of local/national consumption and production
	6.2. Lack of support for small scale fisheries (SSF)
	6.3. Lack of support for fishermen and producers
	6.4. Lack of incentives for sustainable production
	6.5. Fair value chain
7. Consumption habits and choices	7.1. Packaging
	7.2. Seasonality
	7.3. Lack of availability and supply of sustainable products
	7.4. Excessive consumption and demand

Categories	Barriers
	7.5. Lack of diversity of supply
	7.6. Lack of consumption of more abundant species
	7.7. Consumption trends*
	7.8. Consumption seasonality*
8. Legislation, enforcement, bureaucracy and non-compliance	8.1. Existing law enforcement
	8.2. Lack of supervision and control
	8.3. Lack and inadequacy of national and european legislation
	8.4. Lack and inadequacy of punishments and fines
	8.5. Political will to promote seafood and fish's sustainability
	8.6. More restrictive fishing policies
9. Purchasing power and high cost	9.1. High price
	9.2. Low economic capacity and consumer's limited budget
	9.3. Quality/price ratio
	9.4. High cost of more sustainable options

3. 1-DAY MULTI-STAKEHOLDER WORKSHOP

MULTI-STAKEHOLDER WORKSHOP
Date: May 18, 2023
Location: ANP|WWF Headquarters, in Lisbon

3.1. Information on the attendees (number, stakeholder groups, profiles, etc.)

The Multi-Stakeholder Workshop was attended by 15 participants (Figure 3) representing different stakeholders groups, namely: Public Administration, Consumer clusters/groups, Supermarket, Public markets/Fish auction, HORECA (Hotels, Restaurants, andCatering) , Consultancy and Advocacy organizations or individuals, Twin projects, and University departments/Research centers. The Sea2See Portuguese team was represented by nine participants: six as specialists in seafood production and consumption (representing both fisheries and the aquaculture sector), and three as facilitators.

MULTI-STAKEHOLDER WORKSHOP ATTENDEES

- Public Administration:
  - Alda Centeio - DGRM Fisheries
  - Rui Oliveira - DGRM Aquaculture
- Consumer clusters/groups:
  - Mária Pombo - DECO
- Supermarkets:
  - Carolina Garcia - MAKRO
- Fish auction:
  - Felipe Pedro - DOCAPESCA
- HORECA - Restaurants (chefs) and Catering:
  - Patrícia Borges - MARE IPLeiria
  - Sofia Sousa - Nutritionist
- Consultancy and Advocacy organizations or individuals:
  - Nuno Nobre - Seafood Critic
- Twin projects:
  - Narcisa Bandarra - IPMA|FishEUTrust
  - Sónia Pedro - IPMA|FishEUTrust
- University depts/ Research centers:
  - Cristina Pita - CESAM|UA (Sea2See Team)
  - Gisela Costa - CESAM|CCMAR (Sea2See Team)
  - Mafalda Rangel - CCMAR (Sea2See Team)
  - Nuno Leite - SEAentia (Sea2See Team)
  - Sofia Alexandre - CCMAR (Sea2See Team)
- Facilitation:
  - Matilde Almodovar - ANP|WWF (Sea2See Team)
  - Pedro Ramos - ANP|WWF (Sea2See Team)
  - Rita Sá - ANP|WWF (Sea2See Team)

Figure 3- Photo of participants in the Multi-Stakeholder Workshop "Barriers to Sustainable Seafood Consumption in Portugal".

Report Multi-Stakeholder Workshop: "Barriers to Sustainable Seafood Consumption in Portugal" on May 18, 2023 in Lisbon - Project Sea2see

3.2. A summary of the discussion around the second stage of barrier generation and categorisation

Before starting the second stage of barrier generation and categorisation, the process to obtain the presented barriers was explained:

> the online survey resulted in **89 responses** ⇨ corresponding to **242 barriers**
> later grouped in **54 barriers** ⇨ organized in **9 categories** during the internal group session

During the Multi-Stakeholder Workshop, the 54 barriers and 9 categories were presented and individually discussed. This allowed the establishment of a common understanding for each barrier, and clarified their meaning. Throughout this phase, some barriers were changed (e.g., the expression "lack of" was removed from every barrier, to homogenize them, since some barriers had a positive connotation and others a negative one) and five new barriers were added (highlighted in Table 1 with an *).

3.3. A summary of the process of voting for the most relevant barriers

The voting process allowed for a quick and easy identification of the most relevant barriers, in the end 11 barriers were selected (see Table 2). The previous explanation of every barrier made the voting process faster and more clear for the participants.

Table 2 - *Voting results on the most relevant barriers*

NO. OF VOTES	MAIN BARRIERS
14	4.1. Literacy on sustainable fish consumption
13	6.1. Promotion of local/national consumption and production
10	3.1. Prejudice about aquaculture products
9	2.6. Overfishing
9	4.3. Awareness of a more diversified diet
9	9.2. Low economic capacity and consumer's limited budget
9	5.5. Inappropriate and uninformative labels
8	8.3. Lack and inadequacy of national and european legislation
7	7.1. Packaging
7	6.5. Fair value chain
7	4.5. Lack of information

4. BARRIER STRUCTURING

4.1. Short description of the map of barriers and discussion within the workshop

The process of structuring barriers ran smoothly. Participants answered the relational questions generated by the ISM software as a group, and answers were consensual.

After creating the first version of the structural map, the group did not fully agree with the location of every barrier. The barriers considered out of place (barrier 3.1 Prejudice about aquaculture products, and barrier 4.1. Literacy on sustainable seafood and fish consumption; numbers 13 and 17 in the ISM software, respectively) were removed and reintroduced one at a time, leading to two new series of relational questions formulated by the ISM Software (one series for each removed and reintroduced barrier). After the restructuring process, it was possible to achieve a map that met the group's expectations and everyone agreed that the represented relations between barriers were logical (Figure 4).

Overall, the barrier structuring and map generating went well and resulted in a suitable and consistent final result. This was possible because the meaning of each barrier was previously explained to the participants, and collectively discussed one by one. This phase was crucial for the positive development of the workshop and allowed for positive collective work.

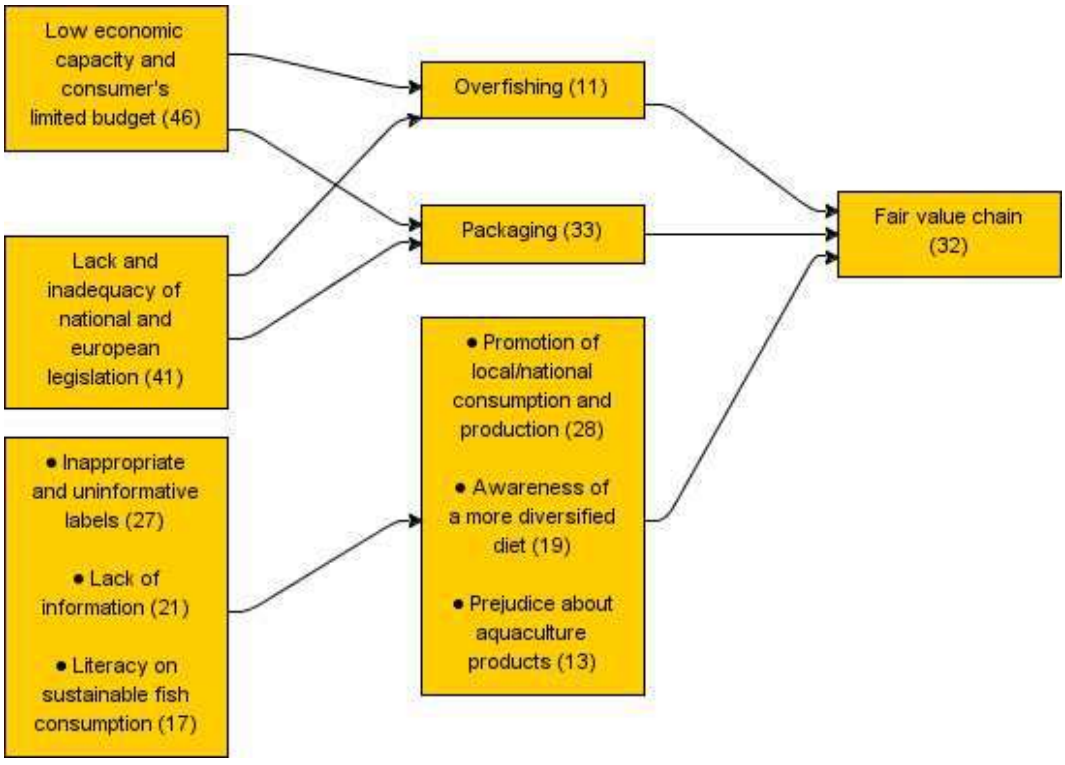


Figure 4 - Structural map of barriers.

5. GENERATING OPTIONS

5.1. List of options for each barrier category

Participants were divided in four groups, two categories were assigned to three of the groups and three categories to one of the groups (Figure 5).

Before generating options, participants were asked to revisit the list of barriers. This caused some confusion, since participants thought it would make more sense to focus on the most voted barriers (the ones used to build the structural map), instead of looking at all barriers again. This way it would be possible to develop specific solutions for the barriers included on the constructed structural map and understand more efficiently which solutions might be the most important ones, how they directly relate with each other and, therefore, how to solve the main challenges for the sustainable consumption of seafood.

To guide the work, participants were asked to think about the following question:

What are the options to overcome the barriers of this category?

The options to answer these questions could include, for example, *Initiatives, Actions, Recommendations, Policies, Activities, etc*. For the development of the options they were encouraged to use action verbs, such as *Create, Require, Encourage, Establish, Plan, Build, Establish, Develop, Organize, Promote, Lead, Change*.

Figure 5 - Listing options to overcome the barriers.

The options that resulted from this work were the following:

What are the options to overcome the barriers of this category?

1. Product quality, public health and animal welfare

1.1. Develop studies to promote ethics, and animal welfare issued adapted to each species captured (regarding the fisheries sector, maintenance conditions and slaughter (regarding the aquaculture sector);

1.2. Create new legislation and adapt the existing one to the present conditions (e.g., octopus aquaculture) in order to ensure quality control, safety and well-being of seafood products.

2. Sustainability and fisheries management

2.1. Scientific and technological investment (fishing gear technology, stocks and fishing areas assessment);

2.2. Increase enforcement and audits;

2.3. Promote participatory processes and fisheries co-management.

3. Perception of aquaculture sustainability

3.1. Develop awareness campaigns;

3.2. Introduce the aquaculture topic on the school programs (through books);

3.3. Support aquaculture production (with financial support and legislation);

3.4. Promote technological innovation.

4. Knowledge, access to information and awareness

4.1. Innovate and consolidate cooperation networks between aquaculture producers (corporate/institutional missions/ international success stories);

4.2. Develop marketing and communication campaigns: advertising (digital media), food tasting and gastronomic events, ambassadors network in points of sale (hypermarkets, supermarkets, restaurants, etc), technology/information (blockchain apps);

4.3. Qualify national aquaculture (mapping of production units, production methods, size, human resources, species, etc.);

4.4. Create a label for national aquaculture with national/international impact;

4.5. Develop actions to raise awareness for good harvesting practices (stocks, closed seasons, seasonality), conservation and fish sale (legislation);

4.6. Create/enhance the educational offer for elementary and high schools, and academia.

5. Traceability, certification and labeling

5.1. Promote the integration of data along the value chain - implement traceability options ;

5.2. Plan/develop a qualitative and simple labeling system (eg. traffic light system) with a QR-code system associated (for those who want more information) - in the packaging;

5.3. Create a certification/brand that may have three levels: basic/intermediate/advanced (depending on the status and effectiveness of its implementation), which includes a component of sustainability, origin and collection method

6. Support for the economy of local/national fish products

6.1. Implement co-management in small-scale fisheries;

6.2. Allow direct sale in sustainable small-scale fishing;

6.3. Reducethe bureaucracy of applications to support mechanisms for both fisheries and aquaculture sectors;
6.4. Adapt the existing support mechanisms to the Portuguese reality: small-scale fishing associations and fishermen with little formal education and low digital literacy;
6.5. Ensure traceability in sustainable small-scale fisheries and aquaculture products and communication of that information to the final consumer;
6.6. Create a sustainable artisanal fishing label that guarantees that local fish is sold locally (short value chain);
6.7. Effectively promote and increase the literacy on sustainable consumption of fishery and aquaculture products through national/local campaigns adapted to different target audiences, starting with younger generations.

7. Consumption habits and choices

7.1. Promote sustainable fish consumption in school canteens (more diversity of species available, revision of legislation and guidelines);
7.2. Develop educational programs (in schools and training for adults);
7.3. Develop campaigns to raise awareness (with the involvement of the commercial sector and public administration), to address eating habits - seasonality, species diversity, consumption/preparation methods, nutritional characteristics, species characteristics (from sea to plate);
7.4. Financial incentives for the use of more sustainable packaging;
7.5. Implement extra fees for less sustainable packaging.

8. Legislation, enforcement, bureaucracy and non-compliance

8.1. Encourage the implementation of co-management systems;
8.2. Revise existing legislation (with the involvement of the fishing community).

9. Purchasing power and high cost

9.1. Develop a food literacy program (identity, culture and tradition), diets and food wheel, nutrition, educating the palate for fish taste, family budget vs health and sustainability.

5.2. A summary of the process of voting for the "SMARTEST" options

Within the previous phases of the workshop, participants developed and proposed 33 options to overcome barriers. Before voting, a spokesperson presented each group's options, and everyone was able to clarify doubts regarding each option.

Participants were then asked to vote on the most relevant options per barrier, considering four different criteria (Figure 6):

Which options are likely to have the most impact?
Which options are feasible?
Which options are likely to be implemented in a timely manner?
Are there people who can defend the option?

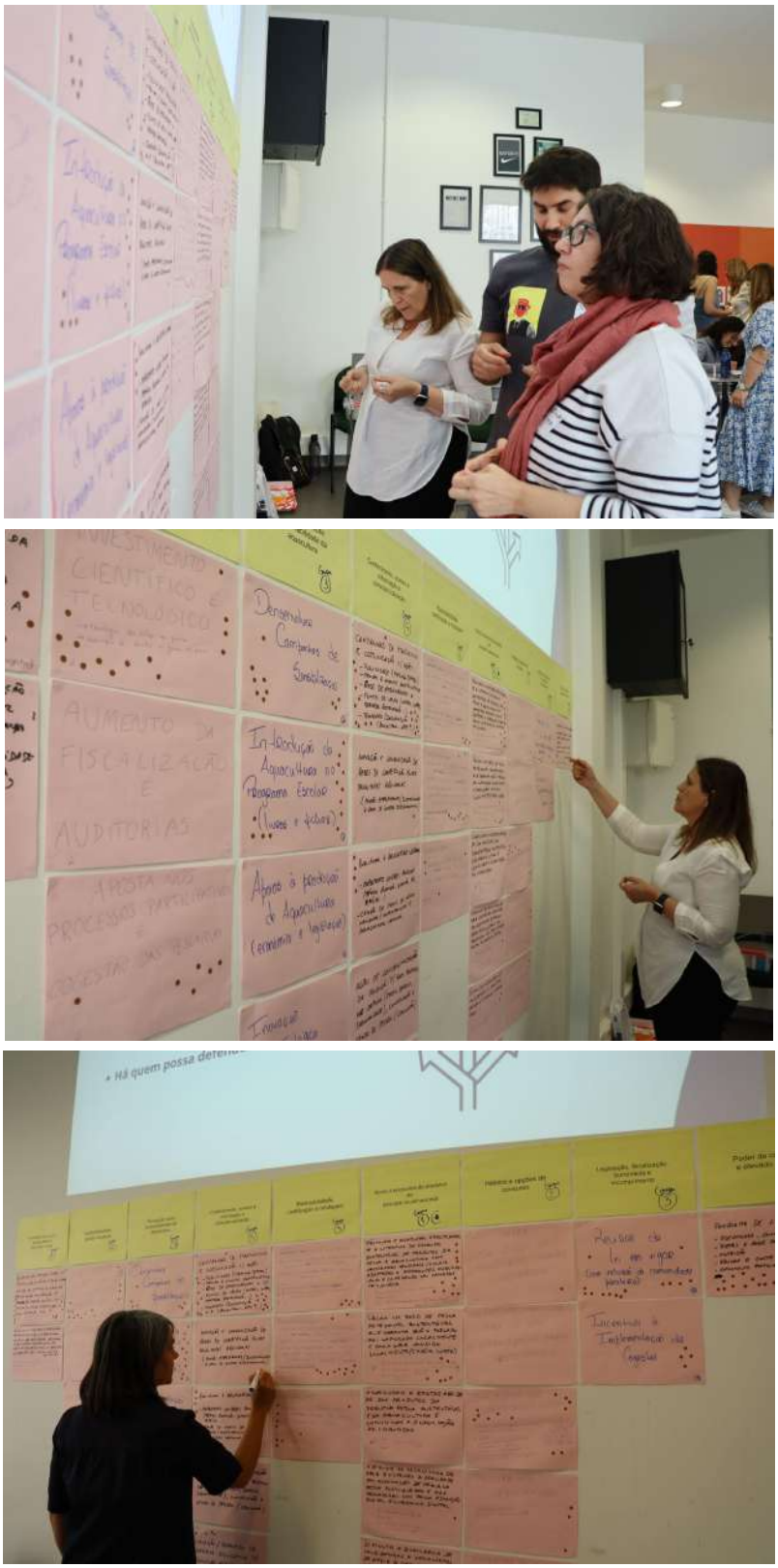


Figure 6 - Voting on the "SMARTEST" option.

The voting process allowed the identification of the 14 most relevant options (see Table 3).

Table 3 - Voting results on top options

NO. OF VOTES	SMARTEST OPTIONS
20	4.2. Develop marketing and communication campaigns: advertising (digital media); food tasting and gastronomic events; ambassadors network; in points of sale (hypermarkets, supermarkets, restaurants, etc); technology/information (blockchain, apps)
19	9.1. Develop a food literacy program (identity, culture and tradition), diets and food wheel, nutrition, educating the palate for fish taste, family budget vs health and sustainability
15	1.1. Develop studies to promote ethics and animal welfare adapted to each species in capture, in the case of fisheries , and maintenance and slaughter, in the case of aquaculture
14	2.1. Promote scientific and technological investment (fishing gear technology; stocks and fishing areas assessment)
14	8.2. Revise the law in force (with the involvement of the fishing community)
14	3.2. Introduce the aquaculture topic in the school program (books)
12	7.3. Develop campaigns to raise awareness (with the involvement of commercial areas and public administration, to address eating habits - seasonality, species diversity, consumption/preparation methods, nutritional characteristics, species characteristics (from the sea to the plate)
11	5.2. Plan/develop a qualitative and simple duo labeling system (traffic light system) - a qr-code system may be associated (for those who want more information) - packaged product
11	6.7. Effectively promote and increase the literacy on sustainable consumption of fishery and aquaculture products through national/local campaigns adapted to different target audiences and starting with the younger generations
10	3.1. Develop awareness campaigns
9	5.1. Traceability - promote the integration of data along the value chain
7	6.3. Decrease the bureaucracy of applications and support mechanisms for fishing and aquaculture
7	6.6. Create a sustainable artisanal fishing label that guarantees that the fish was caught locally and is sold locally (short value chain)
6	2.3. Promote the development of participatory processes and fisheries co-management

5.3. Please also attach the ism software file

- Attached is the ism file (portugal_sea2see_seafood_barriers_eng.ism) + log file + jpeg image of the map

6. RESULTS OF THE STAKEHOLDER MAPPING EXERCISE

6.1. A short summary of the exercise and the delivery of the exercise

The mapping exercise was developed throughout the whole workshop. For that, several cardboards were displayed on the walls, each referring to a different stakeholders' category, enabling participants to identify stakeholders at any time. This exercise was explained by facilitators upon the participants arrival. Over the course of the workshop, facilitators reminded participants of the mapping exercise. Despite that, there were only a few contributions (Figure 7).

The contributions were as follows:

- Twin Projects category
  - Slowfood Movement,
  - Erasmus +,
  - Ouriceiro Mar,
  - Ouriceira Aqua
- Social services & Municipalities category
  - school, military, hospital and university canteens
- Local and National press agencies
  - Sociedade Civil - RTP

Figure 7 - Stakeholder mapping exercise.

7. OVERALL EVALUATION:

7.1. Did you find any difficulties in carrying out the workshop? If yes, how did you overcome them?

Some difficulties arose since the beginning of the process:

- The large number of responses to the online survey resulted in a significant number of barriers (242 barriers), hampering the Barrier Categorisation in the internal working group session. This Barrier Categorisation was complex and time-consuming;
- Regarding the Multi-Stakeholder Workshop, the main difficulty was the time available for the complex agenda (e.g., the stakeholder mapping exercise was greatly impaired by this factor). The lack of time was especially difficult to manage during the revision of barriers and categories, since it took a significant amount of time to explain the meaning of each barrier and category. Nevertheless, the extra time spent on this task was crucial for the successful development of the rest of the workshop, and allowed the remaining tasks to be faster;
- Another obstacle was the fact that the software was not very user-friendly, requiring prior preparation. Overall, the fact that the applied methodology was not developed by the facilitation team did not allow it to be easily adapted or readjusted. Despite the experienced challenges, it was possible to comply with the agenda and achieve the desired results.

7.2. What strengths would you like to point out about the workshop event?

- The Multi-Stakeholder Workshop allowed for different stakeholders to work together, and collectively identify the main barriers for sustainable seafood consumption and some options to overcome them. Also, a genuine dialogue between participants was promoted;
- It is noteworthy that, even though the software was not very user-friendly, it proved to be effective and reflected the group's discussion accurately.

7.3. Is there any other comment you want to add about the entire process?

Comments regarding the methodology:

- The fact that the applied methodology was not developed by the facilitation team did not allow for adapting and/or readjusting certain steps/activities. It would be helpful to know which sections of the workshop are flexible, and which are not;
- The online survey should have more direct questions, perhaps even with the definition of what is understood as a barrier. This would simplify the answers' processing and conversion to barriers;
- It should be mentioned in the methodology that the barriers and categories revision are crucial for the successful development of the workshop. The explanation and discussion of the meaning of each barrier and category was essential for all participants to be on the same page regarding the meaning of each barrier. Furthermore, there should be more time allocated for this task;
- It would be helpful if the software was more modern and user-friendly, for better handling, and be more aesthetically appealing;
- The option generation task should focus only on the most voted barriers (i.e., the barriers used to build the structural map). This way it would be possible to develop more detailed options and perhaps use the map to support that work.

Comments on the Multi-Stakeholder Workshop:

- Overall, it would've been good if there was a wider variety of stakeholders represented at the workshop. Most of the stakeholders were from the sales sector (even though from different groups of the sector). Nevertheless, this reduced diversity may have contributed to the consistency and cohesion of answers throughout the workshop;
- The fact that the workshop was designed to have a limited number of participants forced the invitations to also be limited and targeted to specific people. This restricted the invitation process, especially when the first choices of guests were not available.

Other comments:

- The next steps of the project should be clearer, what will be done with the information collected in these workshops (structural map and set of options generated) and also the way this methodology and workshops contribute to the project's follow-up.

7.4. Workshop satisfaction survey

The satisfaction questionnaire was given to all participants at the end of the workshop. The following scores portray the average of all responses.

- The timeline was respected: 4,9
- The facilitator and co-facilitator helped the workshop process: 5
- The room was good for carrying out the workshop: 4,8
- The process and instructions were clear: 4,8
- During the workshop, I had the opportunity to better understand the barriers to seafood consumption: 4,4
- During discussions, I felt free to express my opinion without being judged: 5
- During the discussion, my opinion was listened and taken into consideration: 4,9

Other comments:

- Ate very well;
- Very good team of facilitators, positive motivated and efficient;
- Times fulfilled exemplary;
- Content explained clearly;
- I think it would be interesting to improve the software output design to make it more understandable and appealing;
- Choice of working groups should be thought to make it easier to create options (instead of random);
- I really enjoyed the food offered during the workshop;
- Very good, very well organized.

9.3.4 SPAIN REPORT

1-DAY MULTI-STAKEHOLDER WORKSHOP REPORT

Barcelona, 10th May 2023

Edited by SUBMON Team
Juanita Z. Pujana
Tecla Maggioni

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

ONLINE BARRIER GENERATION

SUBMON generated the survey on the EU Survey platform in collaboration with Ethic Ocean, and then it was translated into Catalan and Spanish for wider dissemination on the Spanish territory. The survey was launched at the end of March and closed in April.
109 respondents submitted an answer to the survey, and 268 barrier statements were collected.

A summary of data analysis (demographic data, purchasing habits, behaviour toward sustainability) (350 words)

From the pool of 109 respondents, 72 were female (66%), 36 were male (33%), and 1 preferred not to state the sex.
As it regards the self-identification in the proposed categories of stakeholders, the following summarises the most voted categories:

- Academia/Scientist (12,8%)
- Chef/Cook (0,9%)
- Consumer (65%)
- Environmental Consultant (6,4%)
- Member of NGOs (6,4%)
- Public Administration (1,8%)
- Prefer not to say (2,75%)
- Other (2,75%)
- Student (0,9%)

The age of participants showed the highest percentage for the interval 36-49 years old (42,2%), followed by 20-25 years old (22%), 50-64 years old (20,1%) and finally >65 years old (15,6%).

58% of the respondents live 10km from the coast, while 22,9% live between 11km and 30 km, suggesting that most respondents have access to the seaside and the coastal regions.

Regarding where the respondents usually buy seafood, local markets appeared 48 times, supermarkets appeared 72 times, and specialised fishmongers appeared 41 times - the most voted options.

According to the survey, 64.2% of people prefer seafood caught in the wild, while 23.8% have no preference, and only 5% prefer farmed seafood.

BARRIER CATEGORIZATION

Composition of the Internal Working Group (number of members and profiles)

The internal working group was composed of 4 people from SUBMON

- Juanita P. Zorrilla: Biologist, holds an MSc in Marine Management and PhD in Environmental Education. In SUBMON, she is mainly involved in the development of outreach & environmental education, dissemination, and project management for marine conservation.
- Tecla Maggioni: She graduated in Biological Sciences and holds a Master's in Oceanography and Management of the Marine Environment and a Master's in marine sciences. At SUBMON, she participates in conservation, outreach, and education projects.
- Dani San Roman: He graduated in Marine Sciences and holds a Master's in Marine Biology. At SUBMON, he participates in the area of projects.
- Cristina Planella: Graduated in Biology. At SUBMON she participates in environmental education projects.

During the Internal working group session, the barrier statements were collated and transcribed into a Word document. Then we deleted any duplicate statements, split any statement that contained more ideas and merged similar barriers. From the initial pool of barrier statements, 49 unique statements resulted, divided into 8 categories.

The final list of Categories and Barriers to be used at the 1-day multi-stakeholder workshop.

Number	Barrier Statement	Category
1	Lack of information about gear/production	Communication toward consumers
2	Lack of information to make consumption decisions	Communication toward consumers
3	Lack of nutritional information on products	Communication toward consumers
4	Lack of consumer information in supermarkets on the origin of the product.	Communication toward consumers
5	Lack of information on sustainability in consumption	Communication toward consumers
6	Lack of information on sustainability in the catering industry	Communication toward consumers
7	Lack of information at the point of sale	Communication toward consumers

8	Lack of information that reaches consumers (stock status, optimal consumption, respectful fishing gear, local species, species diversity).	Communication toward consumers
9	Little information available to the final consumer (seasonality of species).	Communication toward consumers
10	Disregarding animal welfare at the time of purchase	Habits of consumption
11	Lack of responsibility in consumption	Habits of consumption
12	Disregard for less popular species	Habits of consumption
13	Lack of time when purchasing	Habits of consumption
14	Lack of nutritional education on seafood products	Culture of consumption-Seafood Literacy
15	Difficulty of preparation of seafood products	Culture of consumption-Seafood Literacy
16	Lack of knowledge of different species to be able to diversify consumption	Culture of consumption-Seafood Literacy
17	Difficulty in understanding what sustainable is or means when buying seafood	Culture of consumption-Seafood Literacy
18	Lack of knowledge of: impact of fishing on stocks, impact of aquaculture on the environment, origin, production and fishing gear.	Culture of consumption-Seafood Literacy
19	Young people's lack of knowledge of the fishing world	Culture of consumption-Seafood Literacy
20	Lack of awareness of actors along the value chain (consumers, producers, fishermen etc.)	Culture of consumption-Seafood Literacy

21	Lack of consumer interest in capture methods	Culture of consumption-Seafood Literacy
22	Value chain with many intermediaries	Traceability
23	Product quality	Traceability
24	Lack of communication from the seller	Traceability
25	Lack of transparency in aquaculture and fisheries on origin	Traceability
26	Guaranteed product traceability	Traceability
27	Lack of collaboration of the parties involved	Traceability
28	Lack of confidence in the sustainability of the product	Traceability
29	Lack of artisanal caught product	Sustainable offer
30	Lack of sustainable production in fisheries and aquaculture	Sustainable offer
31	Lack of km 0 products for consumption	Sustainable offer
32	Hostility towards the capture of small species or species that are in danger of extintion	Sustainable offer
33	Adopt the offer to new consumption patterns	Sustainable offer
34	There is no offer of sustainable products	Sustainable offer
35	Labels are not always trustable	Labels
36	It is necessary a better label system	Labels
37	Lack of information about sustainability based on scientific data on labels	Labels

38	Lack of consumer knowledge about labels	Labels
39	Consumers disregard labels when purchasing	Labels
40	Lack of standardized label system	Labels
41	Lack of accessible prices	Price
42	Price inequality	Price
43	Price hampers the access to sustainable products	Price
44	Peaks of demand	Price
45	Conflict between price and quality	Price
46	Buying cheap seafood cannot be sustainable	Price
47	Better surveillance/enforcement in production/fisheries	Policy
48	Lack of clear and forceful regulation implemented	Policy
49	Rules on discards	Policy

1-DAY MULTI-STAKEHOLDER WORKSHOP

- Date: 10th May 2023
- Location: Palau Macaya, Barcelona
- Information on the attendees (number, stakeholder groups, profiles etc.)

13 participants attended the workshop. Different stakeholders' groups were represented:

Academia, Public Administration Chefs, Fisheries consultants, Media and Communication, NGOs, and School canteen. An important consideration to be made is that all the participants brought to the table also the perspective of consumers as individuals.

Participants arrived from different regional areas of Spain, covering most of the different regions and criteria for stakeholder selection.

Summary of the discussion around the second stage of barrier generation and categorisation (350 words)

The workshop participants are asked to take some time to familiarise themselves with the barrier statements and categories that were generated and organised previously by the internal Working Group. On review of the complete list of barriers, participants had time to generate new barriers and rename categories.

This session has promoted quite a lively discussion, with the generation of 10 new barriers that the participants agreed on and categorised and the renaming of a category from "Policy" to "Governance". Also, many barriers' statements were reframed to specify an issue or a concept.

Here follows the list of new barriers generated by the participants:

- Simplistic good/bad perception of seafood products (information toward the consumer)
- Lack of offer and use of new technologies (AI, VR) in selling points (information toward the consumer).
- The morphology of the fish is an important barrier to purchasing and consumption (habits of consumption).
- Seafood preparation and consumption are not prioritised in the planning of activities due to a lack of time (habits of consumption).
- Perception of the sea as distant/unknown (culture of consumption - seafood literacy)
- No information is given in schools on the consumption of seafood products (culture of consumption - seafood literacy).
- Lack of knowledge on how to buy responsibly (culture of consumption - seafood literacy).
- Influence of media, social networks, and marketing in purchasing (habits of consumption).
- Lack of training opportunities for professionals in the seafood industry (culture of consumption - seafood literacy).
- The difference in traceability requirements for processed products (traceability).

- Confusion between regulatory and commercial labelling (labelling).
- Confusion between the price and value of seafood products (price).
- Lack of official communication to counter fake news and misconceptions about seafood products (governance).
- Lack of criteria for responsible consumption in public procurement (governance).

During a discussion on seafood, participants raised an interesting point about the language used to describe consumption and production. They suggested that instead of referring to sustainable consumption, we should use the terms “responsible consumption” and “sustainable production”. This is an important aspect of seafood literacy that deserves more attention.

Furthermore, participants brought to the table the complexity of finding barriers to seafood consumption without considering the different geographical contexts, especially of the Mediterranean and Atlantic sides of Spain (for example, species, sizes, seasonality, etc.).

Shedding light on the policy around seafood waste was referred to as one of the most relevant barriers to the sustainability of the entire seafood value chain. An interesting reflection came out on how to improve the use of seafood, especially those species that are of less interest to the market. A suggestion was made to create effective networks with school canteens or other public institutions to take advantage of those species that are less considered for the seafood market. Additionally, reducing seafood waste would be possible if consumers were more open to trying new things and the distribution and consumption systems were more flexible and efficient.

Another stimulating debate arose on the relationship between the consumer's awareness and the market dynamics: how can consumers, with their responsible purchasing choices, drive the seafood market?

More conscious consumers will demand more sustainable products. While this moves up the seafood value chain, producers will be increasingly inclined to meet consumers' expectations, transforming their methods of production toward sustainable practices.

A summary of the process of voting for the most relevant barriers

When voting for the most relevant barriers in each category, participants took their time to discuss among themselves and put the red sticky dots on the preferred barriers.

The gap between the tenth and eleventh most voted barrier was 1 vote (6 to 5), with 5 barriers statements receiving 5 votes. It was decided to select 10 barrier statements for the process of categorisation. The following table summarises the most voted barriers:

Barrier statement	Number of votes
Lack of correct information that reaches consumers (stock status, optimal consumption, respectful fishing gear, local species, species diversity, social aspects, seasonality, morphology).	15
Confusion between price and value of fishery products*	11
Difficulty in understanding what sustainable is or means when buying seafood	9
Difficulty of handling fish*	8
Confusion between regulatory and commercial labelling*	8
Lack of official communication to counter fake news*	8
Lack of consumer knowledge of: impact of fishing on stocks, impact of aquaculture on the environment, origin, production and fishing gear.	7
Lack of transparency in aquaculture and fisheries on origin	6
Lack of sustainable production and offer in fisheries and aquaculture	6
Lack of surveillance/ enforcement and monitoring in fisheries and aquaculture	6

It's worth mentioning that all categories are represented in the top barriers. What's more, 4 out of 10 barriers were newly generated during the second stage of barrier generation and categorization at the start of the workshop.

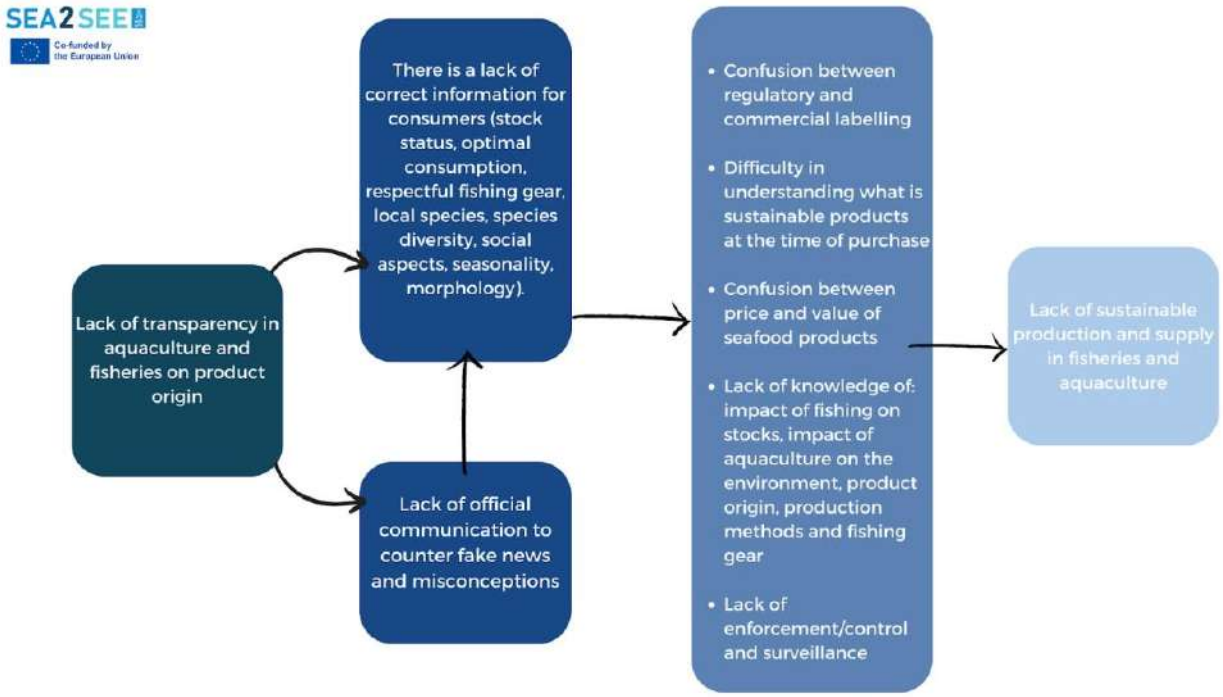
BARRIER STRUCTURING

Short description of the map of barriers and discussion within the workshop (350 words)

The process of barrier structuring was a core element of the workshop, with many interesting discussions arising from the process of voting “yes” or “no” to the question proposed by the ISM software.

The first structural map did not adequately meet the expectations of stakeholders. In fact, the barrier, “lack of official communication to counter fake news and misconceptions”, was considered to be in the wrong positioning.

Therefore, participants decided to vote again, and the structural map below was produced:



The map of barriers resulting from the structuring process suggests that the lack of transparency in aquaculture and fisheries - especially as it relates to the product origin- is the most important barrier to responsible consumption.

Some of the most important reflections and interpretations that came up on the map can be summarised as:

- The lack of proper communication towards consumers concerning a set of elements - such as the stock status, suggestions about optimal consumption, impacts of fishing gears, local species, diversification of species, social aspects, seasonality, and morphological aspects, hinders responsible consumption of seafood.

- The lack of proper communication is also aggravated by the lack of official channels to counter fake news about the seafood and aquaculture sectors, as well as common misconceptions about seafood.

- Several barriers are found in the same box, meaning they feed and aggravate each other:

- The lack of consumer knowledge and awareness on several aspects of seafood generates confusion between regulatory and commercial labelling, thus aggravating the difficulty in understanding what sustainable seafood products are at the time of purchase.

- The existing confusion between the price and value of seafood products: there is a general perception that sustainability goes hand in hand with higher prices, which sometimes does not get along with the real value of species.

- The lack of surveillance and control at the production sites and fishing sites hamper transparent communication towards consumers on sustainable practices, thus reinforcing the other existing barriers.

- The barriers identified at the left side of the map generate dynamics that make the moment of purchase and choice by consumers even more complex. Eco-labelling has taken hold of the market, and for consumers, it might be tricky to understand which labelling to look at when purchasing. Also, a lack of standardisation of labels results in further confusion and lack of trust when it comes to consumers' choices.

- A lack of proper communication and information on the side of retailers, such as supermarkets, fishmongers and selling points, worsens the lack of knowledge of consumers about seafood products, fishing, and aquaculture practices and, in general, about which products are sustainable or not.

- Overall, since consumers hold the power to influence market dynamics and production, a lack of understanding about seafood among consumers could reduce the demand for sustainable production in fisheries and aquaculture. This is considered the least significant barrier.

- It is interesting to mention that one of the most voted barriers - morphology of the fish - was not represented in the structural map, probably because it does not have any aggravating relationship with the other identified barriers. However, participants brought to the table that this important barrier should receive proper attention when it comes to finding solutions to promote consumption and product acceptance and promote actions to overcome this significant barrier.

- The morphology of the fish is a primary barrier for consumption and manipulation in school canteens/restaurants and for the younger generation. An example of a solution to this challenge is the experience of the UK, where in selling points, fish is not sold as a whole. An example in Spain is supermarkets that prepare fish meals for you after you choose which seafood product you would like to consume, and prepare them according to your needs, saving you time and issues when manipulating the seafood.

GENERATING OPTIONS

List of solutions for each barrier category

COMMUNICATION TOWARD CONSUMER

- To improve communication with consumers, information needs to be consistent, with trustable sources. Information should be accessible and simple, also it should be adapted to different sales channels.

- Different communication campaigns should be used to adapt the information to the needs and expectations of consumers.

- IT support can improve communication outlets for consumers, which could complement flyers and other formats at points of sale.

CONSUMPTION TRENDS

- There is a need to improve seafood consumption trends.

- Actions could include the dissemination of receipts and tutorials on how to manipulate and cook seafood products.

- Also, in many supermarkets, there is the opportunity to purchase already ready-to-eat seafood products.

- Those actions should target different types of consumers, taking into account consumption trends, and they should be adapted to different sales channels.

SEAFOOD LITERACY (CONSUMPTION CULTURE)

- Promote opportunities for learning for consumers through dissemination and education. Seafood literacy is a small component of Ocean Literacy; thus ensuring appropriate education opportunities for both will promote a better literate society.

- Guarantee that the dissemination of information on seafood is done at all levels of society: formal and informal education, campaigns for the general public and also for all the stakeholders along the seafood value chain.

TRACEABILITY

- Develop an EU digital system of labelling which guarantees the traceability of the seafood product. This system could replace the ongoing system which uses paper labels that frequently get lost throughout the value chain.

- Develop and implement a policy at the European level to guarantee the traceability of seafood products (fresh, processed, imported, exported etc.)

SUSTAINABLE OFFER

- Promote in sales points the concept of sustainability in seafood production to make the consumers more aware, thus driving the market toward a more sustainable offer.

- Give visibility to best practices in the seafood industry and champion sustainable seafood production in selling points and through media.

- Provide mandatory tools to consumers for identifying and differentiating sustainable products (social, environmental sustainability) when purchasing seafood.

LABELS

- Implement a system of digital traceability.

- Improve control and surveillance.

- Develop and implement an EU mandatory and official label for seafood products (fresh, frozen, and processed seafood)

- Acknowledging the complex and multi-layered system of sustainability within the seafood value chain for proper communication with consumers.

PRICE

- To ensure a better understanding of the price value by consumers, the system of price building should be communicated properly and openly to also improve the awareness of consumers on how much a product costs.

- Implement communication campaigns to give visibility to fisheries and aquaculture, so to ensure a better understanding of both fields and reduce myths and misconceptions. the work and the labour. To ensure that consumers will give the right price-value to seafood products, the communication campaigns should cover several elements of the seafood industry, such as:

- General aspects of fisheries and aquaculture
- Cultural elements
- Economic aspects
- Equity, diversity, and inclusion
- Job opportunities

- Promote campaigns on the impact of fish consumption on health.

GOVERNANCE

- create forums or multi-stakeholder networks (scientists, fishermen-farmers, administration, NGOs, consumers...) to respond to possible fake news about the seafood industry and products and to generate and disseminate truthful information about the sector to young people (social networks) and the public (radio, TV...). This will increase product acceptance and reduce misconceptions.

- Develop guidelines on criteria for responsible consumption in public procurement (catering, schools, hospitals, residences, etc.).

- Open public channels of information on surveillance and control action: report on measures implemented and sanctions to improve consumers' trust and acceptance of seafood products.

OVERALL EVALUATION:

Did you find any difficulties in carrying out the workshop? If yes, how did you overcome them? (350 words)

Overall, the workshop was a success. The participants interacted well with each other and engaged in insightful discussions throughout the sessions. All attendees were attentive and actively participated in the workshop. The first session, which focused on generating and categorising barriers, sparked a lively debate where participants defended their opinions and introduced interesting topics. All comments and opinions were acknowledged and taken into consideration, leading to the identification of new barriers to seafood consumption. These newly identified barriers were crucial in the process of structuring.

It is worth mentioning that a limitation of this initial session was the need to resume broad concepts in sentences with a limited number of words. This sometimes led to misunderstandings or different interpretations of the barrier statements. However, the facilitator and co-facilitator took the time to explain each barrier statement in detail, so to avoid any confusion.

What strengths would you like to point out about the workshop event? (350 words)

The group of stakeholders gathered was very balanced, with representatives from different sectors of the seafood industry. However, it is to mention that a better geographical representation would have guaranteed a more comprehensive landscape of stakeholders. Also, it was suggested that a better representation of the public administration would have been worthy.

Participants had great discussions and debates; housekeeping rules were respected.

The facilitator team stick on time and deliver all activities that were planned for the 1-day workshop.

Having the right content is crucial for any participatory process, but in this instance, the location was just as important for achieving success. The workshop was held in a spacious venue with ample room for participants to move about, natural light, and comfortable seating arrangements. The venue itself was a stunning example of modernist architecture that made the day a unique and memorable experience for all attendees in Barcelona.

· Is there any other comment you want to add about the entire process? (350 words)

TAKE HOME MESSAGES

- Vocabulary reflection: responsible consumption vs sustainable production.

- Morphology of the fish as a primary barrier for consumption and manipulation in school canteens/restaurants and for the younger generation. An example of a solution to this challenge is the experience of the UK, where in selling points, fish is not sold as a whole. An example in Spain is supermarkets that prepare fish meals for you after you choose which seafood product you would like to consume.

- Acknowledging the complexity of the seafood industry and the difficulties in engaging stakeholders along the value chain, especially consumers.

9.4 SEA2SEE FLYER FOR THE GENERAL PUBLIC