AQUA-LIT

DELIVERABLE 4.1
From Prevention to Recycling Toolbox

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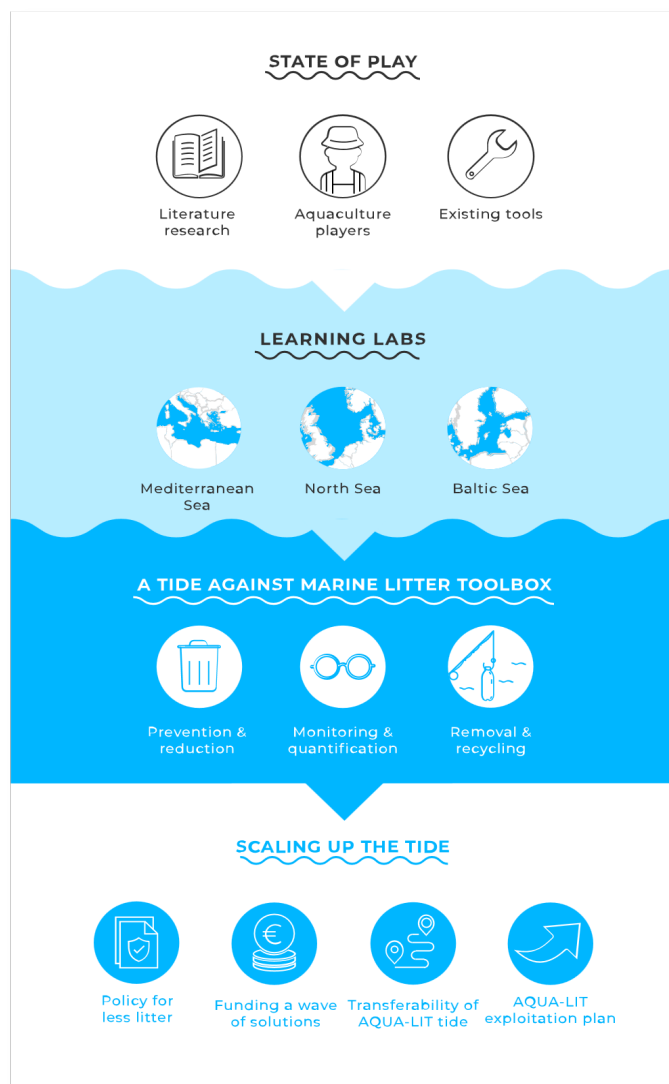| VERSION	DATE	REASON	REVISED BY
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Contenido

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AQUA-LIT project

AQUA-LIT is an EASME-EMFF funded project that aims at providing the aquaculture sector with a sustainable **toolbox** of innovative ideas and methodologies to address the 3 main components of marine littering: **prevention & reduction, monitoring & quantification, and removal & recycling.**

To fulfill this mission, we will be working face-to-face with aquaculture farmers in three **regional Learning Labs**: at the **Mediterranean basin, the North Sea and the Baltic Sea regions.** In parallel, we will identify and cluster existing, upcoming and already implemented tools on marine littering, and we will further **develop a platform and an app** for providing the **'Tide against marine litter toolbox'.**

Lastly, we will **'scale up the tide'** by developing the '**policy for less litter'** set of recommendations, by showcasing the **'funding a wave of solutions'** available for the sector and by coming up with a **transferability plan for outermost regions.**

Through this, we expect to help all stakeholders from the aquaculture chain to increase the understanding, awareness and availability of solutions, so a potential **transformation of the aquaculture sector towards a less polluting sector** can become possible.

STATE OF PLAY

Literature research — Aquaculture players — Existing tools

LEARNING LABS

Mediterranean Sea — North Sea — Baltic Sea

A TIDE AGAINST MARINE LITTER TOOLBOX

Prevention & reduction — Monitoring & quantification — Removal & recycling

SCALING UP THE TIDE

Policy for less litter — Funding a wave of solutions — Transferability of AQUA-LIT tide — AQUA-LIT exploitation plan

Project Consortium

Geonardo Environmental Technologies **(GEO)**

European Centre for Information on Marine Science and Technology **(EurOcean)**

Vlaams Instituut voor de Zee -Flanders Marine Institute- **(VLIZ)**

Sustainable Projects GmbH **(s.Pro)**

Instituto Español de Oceanografía -Spanish Institute of Oceanography- **(IEO)**

Société d'Exploitation du Centre National de la Mer - French National Sea Centre in Boulogne-sur-Mer- **(Nausicaa)**

Fundo Regional para a Ciência e Tecnologia -Regional Fund for Science and Technology- **(FRCT)**

1. Executive Summary

AQUA-LIT's project main objective is to provide the aquaculture sector with a Toolbox that can provide **existing, upcoming and already implemented tools, case studies, best practices, a database and links between stakeholders** for addressing the 3 main components of marine littering from aquaculture activities: prevention & reduction, monitoring & quantification, and removal & recycling. It encompasses three sea basins: the Mediterranean basin, the North Sea and the Baltic Sea regions.

The assessment is based on the proposed tools and governance approaches developed during the AQUA-LIT Learning Labs in the [Mediterranean Sea](#), [North Sea](#) and [Baltic Sea](#) regions, and at the same time built on AQUA-LIT's comprenhensive review including: [D2.2 Knowledge Wave on Marine Litter from Aquaculture Sources](#), [D2.3 Available Tools and Measures](#), [D2.4 Potential Future Impacts](#) and [D3.5 Learning Labs outcomes (portfolio of best practice fact sheets)](#)

Therefore, the **AQUA-LIT Toolbox is the result of the compilation of the information provided by the stakeholders in the frame of the project, the state of play regarding the aquaculture marine litter management in 2019 and 2020 and the input of the experts that have been part of or have work closely together with the AQUA-LIT team**. Thus, this Toolbox can be used as a guidance for the management of the marine litter that comes from aquaculture in the European context. The targeted audience includes aquaculture farmers; professional clusters, associations and platform representatives; policy makers; port authorities; aquaculture gear and equipment producers; engineering, system design and construction companies; plastic manufacturers; waste managers; researchers; environmental and social consultancies; NGOs; classification and certification bodies; communicators and any other interested person.

In this context, the AQUA-LIT Toolbox is a useful application that helps to:
1. Increase the awareness regarding the harm and the impact of non-organic marine litter associated to the aquaculture sector.

2. Involve all the potential stakeholders in the reduction and prevention of marine litter from aquaculture.

3. Improve the gear identification during the cleaning-up initiatives.

4. Expand potentially applicable good practices and solutions.

5. Identify the knowledge gaps that need to be attended to enforce the technical knowledge of the aquaculture farmers and that need to be filled in by researchers and designers.

6. Identify the policy and regulation gaps across Europe that need to be addressed to enforce the litter management practices.

7. And facilitate the knowledge exchange among all the involved stakeholders.

Therefore, the AQUA-LIT Toolbox aims can be considered the most important knowledge repository for aquaculture-mairne litter related information across Europe and the starting point for the development of new European policies regarding the marine litter coming from aquaculture.

1.1. Objectives and structure of the present deliverable

The aim of this deliverable is objective oriented: to provide a general overview of the Toolbox structure and to give a clear guidance for the Toolbox being used by any stakeholder. It also contains a general overview of the main sources of information used for creating the toolbox.

This deliverable contains de following structure:

1. Executive summary.
2. What is a From Prevention to recycling Toolbox, including:
   o AQUA-LIT Toolbox objectives; and
   o AQUA-LIT Toolbox challenges and limitations.
3. Description of the toolbox structure (including the sources of information):
   o Solutions and measures.
   o Port Facilities reception points.
   o Funding opportunities.
   o Marine Litter Inventory.
   o Action plans and policy recommendations.
   o Submit extra information button.
4. Conclusions and recommendations.

2. What is a From Prevention to Recycling Toolbox?

AQUA-LIT's project main objective is to provide the aquaculture sector with a toolbox that can provide **existing, upcoming and already implemented tools, case studies, best practices, a database and links between stakeholders** for addressing the 3 main components of marine littering from aquaculture activities: prevention & reduction, monitoring & quantification, and removal & recycling.

The toolbox is accessible via an online platform and a mobile app and encompasses three sea basins: the Mediterranean basin, the North Sea and the Baltic Sea regions. Nevertheless, the **major innovation** of the project is to go beyond a "one size fits all" tool or approach to work with stakeholders in a multi-actor approach, with the aim to create a toolbox that can be used to achieve **integrated governance** and **economic development** in different contexts across Europe.

This platform can act as the mechanism for linking the regional available solutions and tools, innovators, farmers and other actors along the chain to implement solutions against marine littering from aquaculture activities

The assessment is based on the proposed tools and governance approaches developed during the AQUA-LIT Learning Labs in the [Mediterranean Sea](#), [North Sea](#) and [Baltic Sea](#) regions, and at the same time built on AQUA-LIT's comprehensive review:

- [D2.2 Knowledge Wave on Marine Litter from Aquaculture Sources](#)
- [D2.3 Available Tools and Measures](#)
- [D2.4 Potential Future Impacts](#)
- [D3.5 Learning Labs outcomes (portfolio of best practice fact sheets)](#)

Moreover, the Toolbox itself has provided a forum for consultation and validation of relevant stakeholders as the platform and app have been tested by AQUA-LIT's aquaculture network, **by at least 80% of the former Learning Labs participants, in addition to at least 15 other users from AQUA-LIT's network per sea basin.**

All this information will fill in a platform that will be available in the AQUA-LIT website and also as a smartphone application.

The Platform will have a point entrance for each of the following sections:

1. Solutions and recommendations to prevent, reduce, monitor, quantify, remove and recycle the marine litter that comes from aquaculture. Related with the solutions, recommendations and good practices currently applied, the user will find also:
   - The linked barriers.

o The stakeholders that are currently applying the related good practices.
o And any other extra information related to governance or economic development, among other topics.

Solutions and recommendation section has, in turn, 4 main entrance pathways, which have been identified based on the Learning Lab reports. These main entrance pathways are:

o **By stage**: the information will be provided according to the main three components of the litter management.
o **By type of aquaculture**: the information will be provided according to the main three types of aquaculture included in the Toolbox solution.
o **By Sea basin**: the information will be provided according to the three regions included in the AQUA-LIT project.
o **By categories of measure**: the information will be provided according to the four types of measures identified in our Learning Lab reports.

This section includes also a Frequently Asked Question and Keywords browsers.

2. Port reception facilities for aquaculture litter data in multiple European countries.
3. Action plans and policy recommendations (link to the AQUA-LIT deliverable), which provides a set of recommendations to improve decision-making and to overcome the existing gaps.
4. Funding a wave of solutions, which contains financial opportunities information for stakeholders to implement marine litter management related projects.
5. AQUA-LIT Marine Litter Inventory (link to the website Inventory), which provides a description of all aquaculture related items that can be observed as litter in the marine and coastal regions.
6. Finally, there is a section called "Submit information" which allows the (previously registered) user submit more data related to litter management including, among other, new solutions and recommendations or port reception facilities information.

2.1. Toolbox objectives

The main objectives of the AQUA-LIT Toolbox are:

1. Provide all the available and upcoming solutions and mechanisms for preventing and reducing the marine littering produced by the aquaculture sector in Europe.

2. Provide all the available and upcoming solutions and mechanisms for monitoring and quantifying on a structured and easier way the marine littering produced by the aquaculture sector in Europe.

3. Provide all the available and upcoming solutions and mechanisms for removing, minimizing and recycling the marine littering produced by the aquaculture sector in Europe.

2.2. Toolbox challenges and limitations

1. The information supplied in the toolbox has been extracted from the previous deliverables of the project, mainly Learning Lab reports and Deliverables D2.2 Knowledge Wave on Marine Litter from Aquaculture Sources, D2.3 Available Tools and Measures, D2.4 Potential Future Impacts and D3.5 Learning Labs outcomes (portfolio of best practice fact sheets).Therefore, the **AQUA-LIT Toolbox is the result of the compilation of the information provided by the stakeholders in the frame of the project, the state of play regarding the aquaculture marine litter management in 2019 and 2020 and the input of the experts that have been part of or have work closely together with the AQUA-LIT team**.

2. Thus, the Toolbox cannot be considered a compilation of all the available good practices and solutions related to aquaculture marine litter that are taking place in the Baltic Sea, Mediterranean Sea and North Sea basins.

3. Nevertheless, the AQUA-LIT Toolbox can be used as a guidance for the management of the marine litter that comes from aquaculture in the European context. The targeted audience includes aquaculture farmers; professional clusters, associations and platform representatives; policy makers; port authorities; aquaculture gear and equipment producers; engineering, system design and construction companies; plastic manufacturers; waste managers; researchers; environmental and social consultancies; NGOs; classification and certification bodies; communicators and any other interested person.

4. Besides, it will be a tool in development for 5 years as users contribute to it: registered users will be allowed to suggest more solutions (see Submit extra information button section for more information). This tool will facilitate the knowledge exchange and enhance the communication among the aquaculture stakeholders.

5. The information related to the Port Reception Facilities (PRF) of aquaculture litter is restricted to the following countries: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden, Belgium, Spain, France, Italy and Portugal due to the lack of available information, which is not easy to be accessed and gathered. Moreover, the data provided for Spain and Italy is fragmented due to the large number of ports, the multiple authorities and organizations involved (national port authorities, regional port authorities, waste management companies and fishermen's guilds, among others) and the heterogeneity of their port and disposal point

regulations. See <u>Port Reception Facilities for aquaculture litter disposal</u> section for more information.

6. In this context, moreover, it has to be taken into account that the PRF capacities and its fee system will change once the Member States of the European Union will adopt the **Directive (EU) 2019/904 of 5 June 2019 on the reduction of the impact of certain plastic products on the environment** (SUP-D) and the revised **Directive (2000/59/EC) of 17 April 2019 on Port Reception Facilities for the delivery of waste from ships (PRF-D)**. The implementation of the SUP-D is expected to happen in 2021, in the case of the PRF-D in 2019. Therefore, for future projects, it is advisable to analyse the improvements and changes in the PRF in a medium-term future, and how these improvements have had an impact on the aquaculture litter management.

3. Description of the Toolbox structure

The **main interface** of the toolbox will contain the following menu to access different type of information:

Figure 1- Schematic diagram of the different sections making up the toolbox.
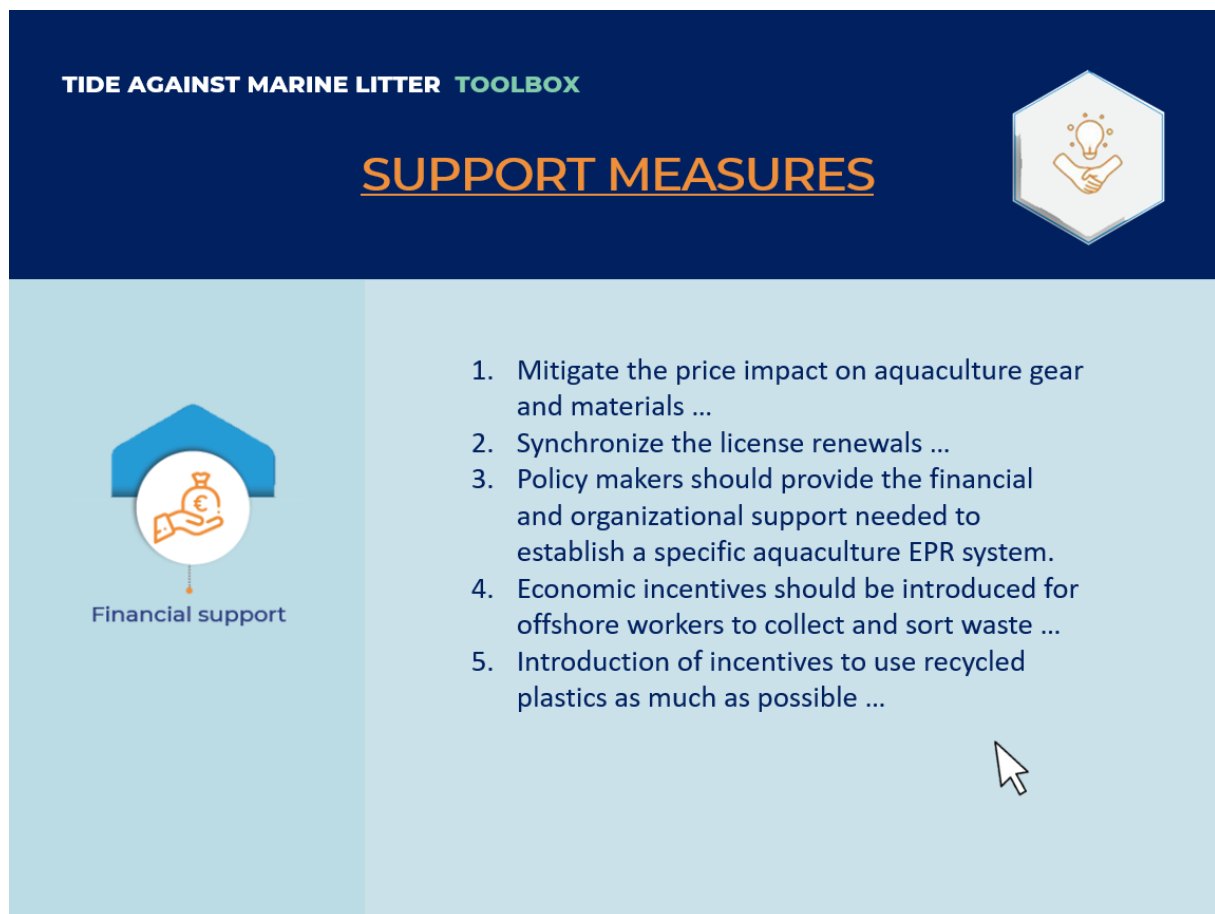
*The design above is a draft of the toolbox. The toolbox might look different once developed.

- Solutions and measures, containing the ideas and solutions proposed by the AQUA-LIT stakeholders in our Learning Labs.

- Port Facilities Reception Disposal Points in Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden,, Belgium, Spain, France, Italy and Portugal.

- Funding opportunities related to aquaculture litter management.

- AQUA-LIT Marine Litter Inventory.

- Action plans and policy recommendations

- Button for submitting extra information to feed the toolbox.

3.1. Solutions and measures

Structure

In the main menu of Solutions & Measures, and depending on the user's interests, he/she will have to choose one of the four pathways, which are:

a) By stage: the information will be provided according to the main three components of the litter management:

    a. Prevention and reduction.
    b. Monitoring and quantification.
    c. Removal and recycling.

b) By type of aquaculture: the information will be provided according to the main three types of aquaculture included in the Toolbox solution:

    a. Shellfish.
    b. Finfish.
    c. Seaweed

c) By Sea basin: the information will be provided according to the three regions included in the AQUA-LIT project:

    a. Baltic Sea basin.
    b. Mediterranean Sea basin.
    c. North Sea basin.

These three roads would then lead to option:

d) By categories of measure: the information will be provided according to the four types of measures identified in our Learning Lab reports:

    a. Support.
    b. Knowledge.
    c. Responsibility.
    d. Legislation.

If the menu (d) is accessed directly from the „Support and measures" menu, all types of measures will appear under the chosen category. However, if for example, the menu (d) through the path „c) by sea basin -> Mediterranean sea", then all the measures displayed under menu (d) will be those relevant only for the chosen sea basin.

Afterwards, the user has to choose among the types of measures for each of the previous categories of measures, which are the following ones:

Figure 2-Categories included in the measures section of the toolbox.

a. Support:

  I. Financial support.
  II. Technical support.
  III. Support for monitoring.
  IV. Support for waste management.
  V. Support for education, communication and awareness training.

b. Responsibility:

  I. Shared responsibility.
  II. Producer responsibility.
  III. Farmer/user responsibility.
  IV. Corporate Social responsibility.

c. Knowledge:

  I. Data quantification on marine debris.
  II. Materials and design.
  III. Research and innovation.
  IV. Marine debris management.

d. Legislation:

  I. Preconditions for licensing.
  II. Regulations.

III.   Policy.
IV.   Harmonisation.
V.   Certification.

Then, for the case of the four potential pathways, the solutions matching the combination of the combined filters will be displayed as a list for the user, so that he/she can select the one that fits better his/her interests.

Figure 3-Categories included in the support measures section of the toolbox.

Figure 4-List of support measures of the toolbox.

The design above is a draft of the toolbox. The toolbox might look different once developed.

The user can go through the solution list and select one of them to display all the information related to that specific item. The provided information per solution consist of:
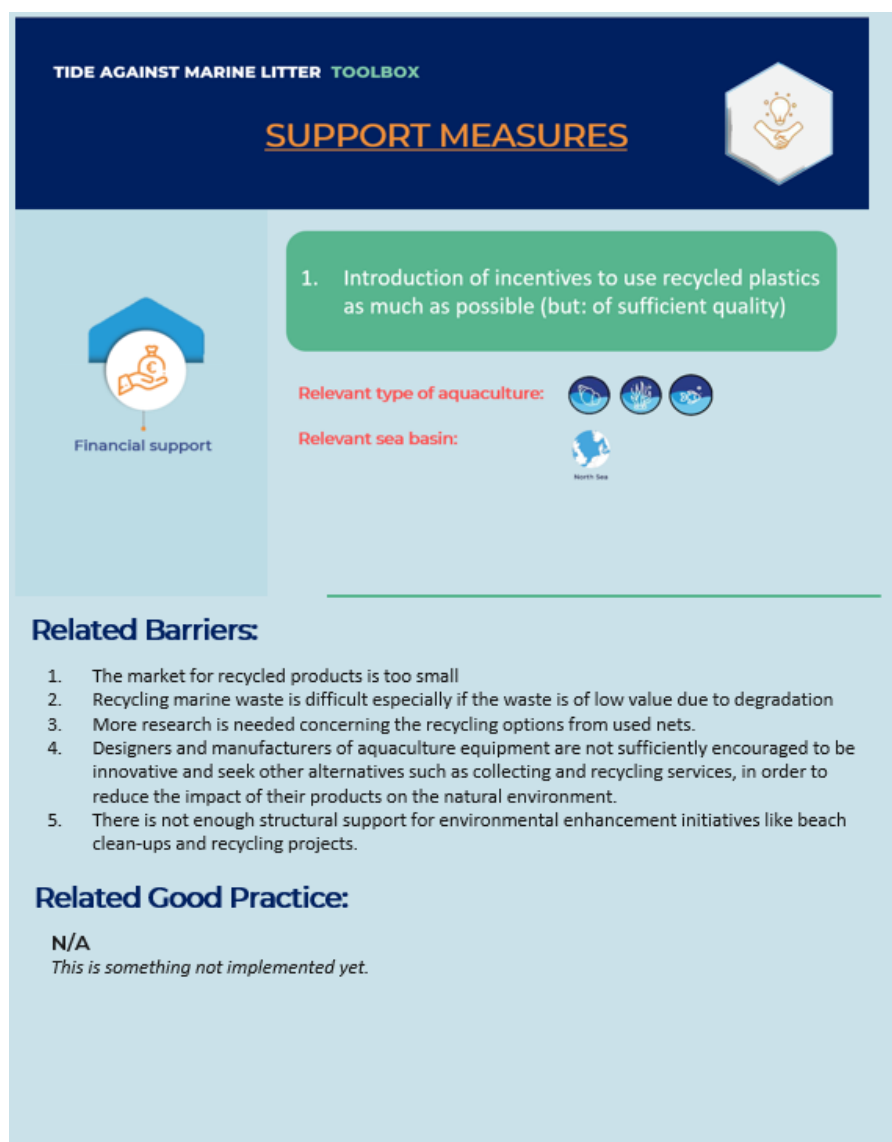
Figure 5-List of Related Barriers and Good Practices included in the support measures.

The design above is a draft of the toolbox. The toolbox might look different once developed.

1. Icons related to stage, categories and types of measures, sea basin and type of aquaculture.

2. Name of the solution, as it also appears in the Learning Lab reports.

3. Related barriers section. The linked barriers have been identified and selected from the list of barriers available in each of the Learning Lab reports. The user can reach the barriers section by scrolling down from the top of the solution interface to the bottom; there might also a "Barriers" button at the top of the solution interface that

will lead the user directly to the list of linked barriers. If there are no identified linked barriers, "N/A" will be displayed under this section.

4. Good practices linked to the solution button, including: code of good practice, name of the good practice and explanation of the good practice. The good practices had already been linked to a specific solution for the Learning Lab report purposes. The user can reach the good practices section by scrolling down from the top of the solution interface to the bottom; there might be also a "Good Practices" button at the top of the solution interface that will lead the user directly to the information related specifically with the good practice. If there are no identified linked good practices, "N/A" will be displayed under this section.

5. Links to the stakeholders' website, which apply or are related to the solutions and the good practices. The stakeholders had been already specified for the Learning Lab report purposes. The user can reach the stakeholder section by scrolling down from the top of the solution interface to the bottom; there might be also a "Stakeholder" button at the top of the solution interface that will lead the user directly to the stakeholder information. If there are no identified linked stakeholders, "N/A" will be displayed under this section.

6. Extra information button: Governance, specific country information, etc (if available). This information has been extracted from the multiple AQUA-LIT deliverables: Learning Lab reports, D 2.2, D 2.3, D 2.4 and D 3.5. The user can reach the extra information section by scrolling down from the top of the solution interface to the bottom; there might be also an "Extra Information" button at the top of the solution interface that will lead the user directly to the available extra information. If there is no identified linked extra information, "N/A" will be displayed under this section.

7. Picture about the barriers, the solutions or the good practices (if available). Credits of the pictures are also displayed below each picture.

FAQ section

In the inner menu of „Solutions and recommendations", the user can also opt for using the list of Frequently Asked Questions (FAQ). The FAQ questions have been created based on the available solutions from the Learning Lab reports and trying to cover as much as possible topics. They have been categorised under the themes which had been previously created for grouping the solutions in the Learning Lab reports.

Therefore, once the user clicks on the FAQ question, a list of topics are displayed. He/she can click on one of the themes to visualize the list of FAQ linked to that theme:
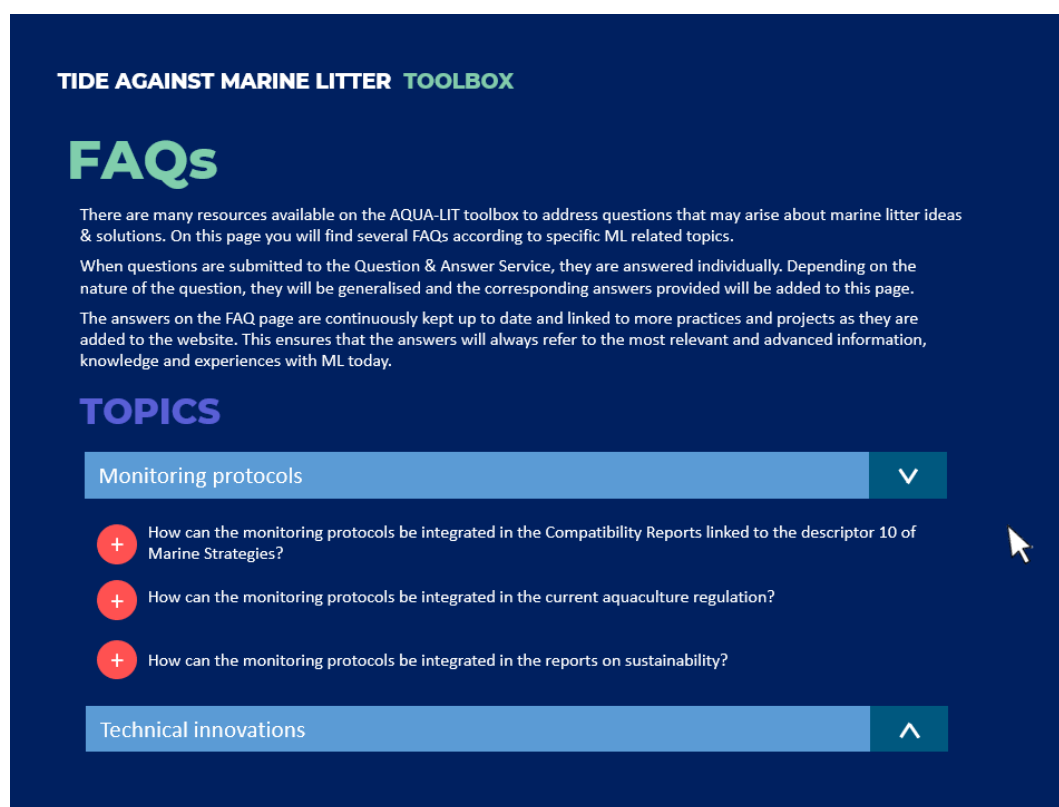
Figure 6-Example of the Frequently Asked Questions (FAQs) section of the toolbox.
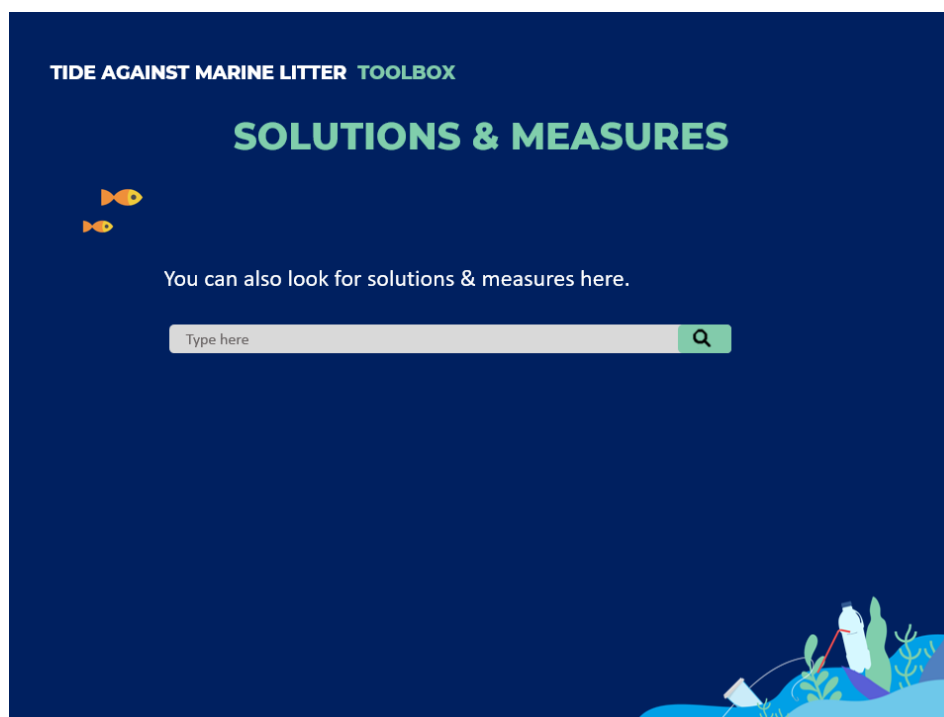*The design above is a draft of the toolbox. The toolbox might look different once developed.*

Afterwards, by clicking in one of the FAQ, the user will get the list of associated solutions:
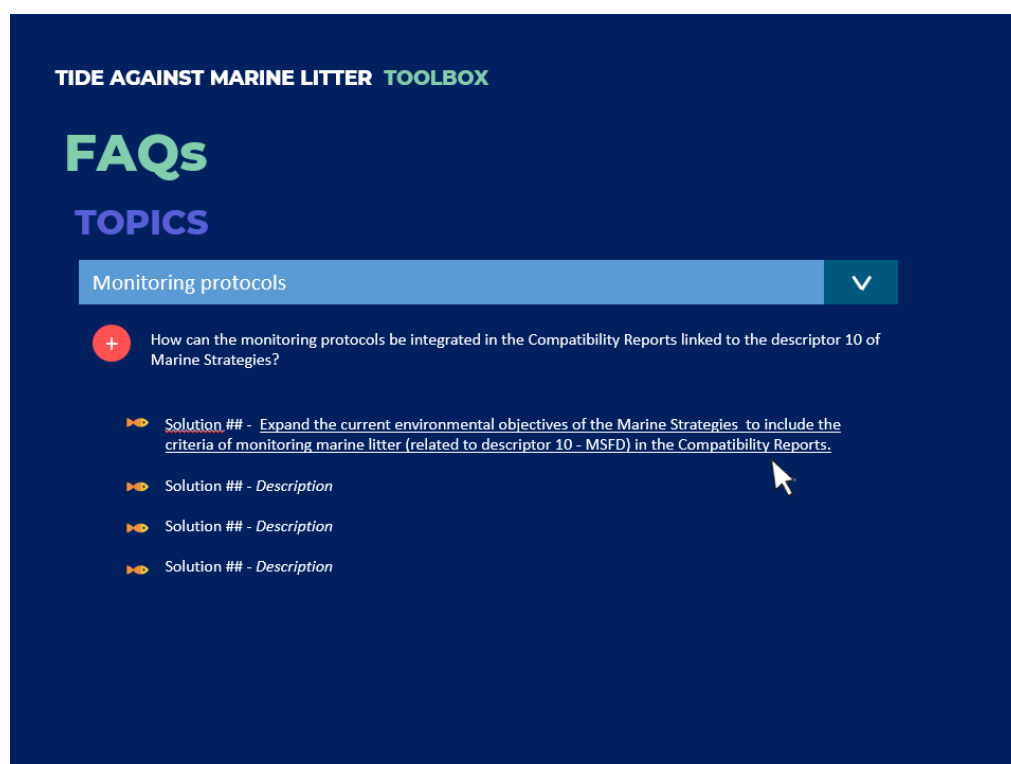
Figure 7-Example of the Frequently Asked Questions (FAQs) according to topics, in this case monitoring protocols.
The design above is a draft of the toolbox. The toolbox might look different once developed.

Finally, if the user clicks on one of the displayed solutions, he/she will be redirected to the specific interface for that solution.

Browser and keywords

Finally, if the user scrolls down in the main menu of Solutions & Measures, the Browser option will be displayed. The user can look for solutions and measures by typing keywords in this browser.

Figure 8-Solution and measures browser in the toolbox.
The design above is a draft of the toolbox. The toolbox might look different once developed.

Per each of the solutions, a variable number of keywords (minimum of 2) have been identified by the AQUA-LIT team, based on the name of the solution, the theme under each solution was grouped for the Learning Lab report purposes and any other specificity needed to be highlighted (e.g. the name of the country where that solution should be applied in case is country-specific).

Therefore, when the user clicks on the keyword browser, he/she can type as many words as needed. The solutions that contain the typed words will be shown, based on an „AND" (excluding) relation. For example, if the user types "Removal" and "gear", he/she will get solutions that contain Removal AND Gear, not the solutions that contain only one of this words OR another.

Nevertheless, any typed word that has not been previously identified by the AQUA-LIT and that is not included as a keyword will be ignored by the operating system.

If none of the typed words matches the list of keywords for any of the solutions, a warning message will be shown („no results found") and the user will be invited to use the FAQ section.
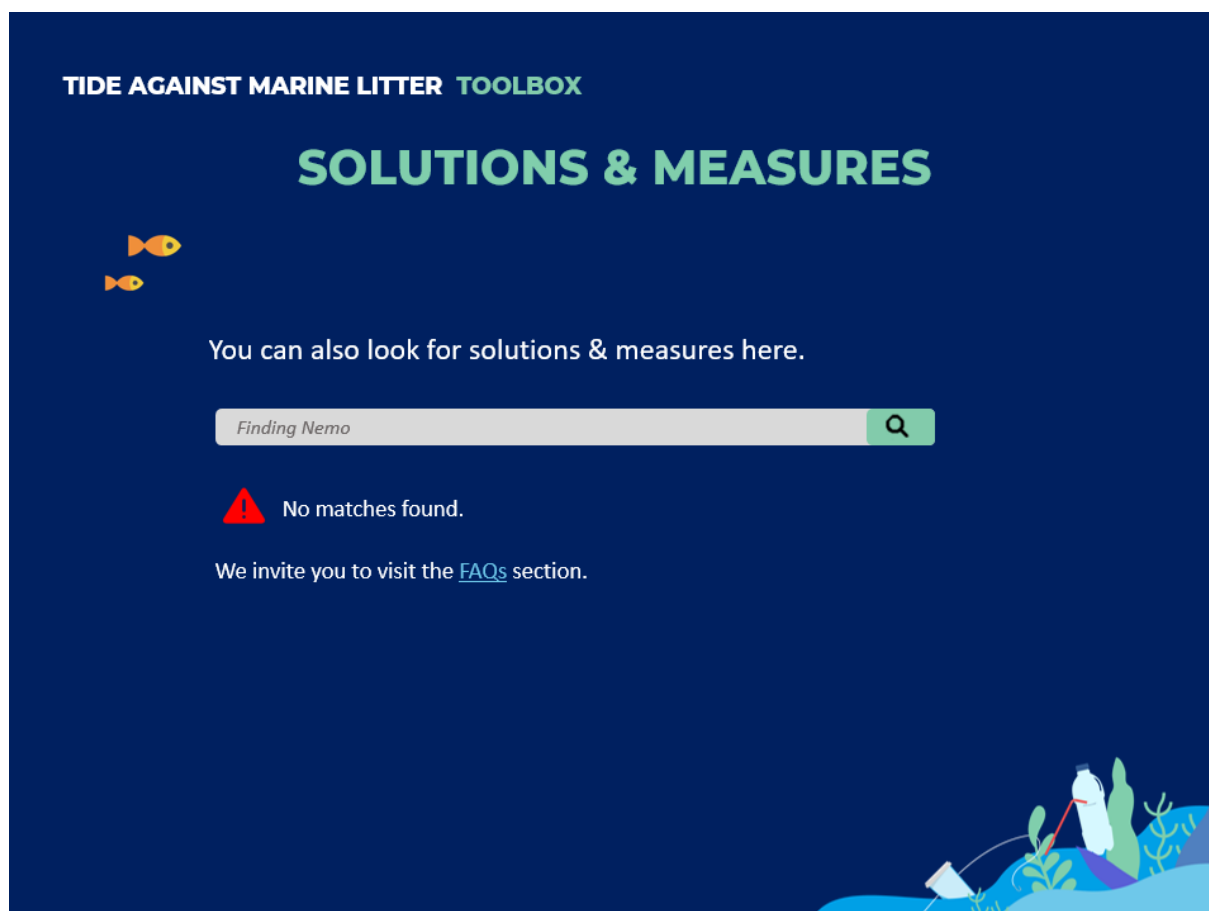
Figure 9-Screenshot of outcome when keywords do not match search and user is re-directed to the FAQs section.

*The design above is a draft of the toolbox. The toolbox might look different once developed.

Examples of the Toolbox use

EXAMPLE 1

I AM WORKING IN A NGO, STARTING A PROJECT RELATED TO MONITORING AND QUANTIFICATION OF AQUACULTURE LITTER, AND I NEED TO GATHER INFORMATION ABOUT STANDARDISED FORMS AND PROCEDURES.

Solutions and recommendations / By stage → MONITORING AND QUANTIFICATION / By Category of measure → KNOWLEDGE / By Type of measure → Data quantification on marine debris /check all the available solutions / select „Standardise monitoring protocols and characterization of marine litter derived from aquaculture facilities at a national level":

TIDE AGAINST MARINE LITTER TOOLBOX

KNOWLEDGE MEASURES

Data quantification on marine debris

Materials and design

Research and innovation

Marine debris management

TIDE AGAINST MARINE LITTER TOOLBOX
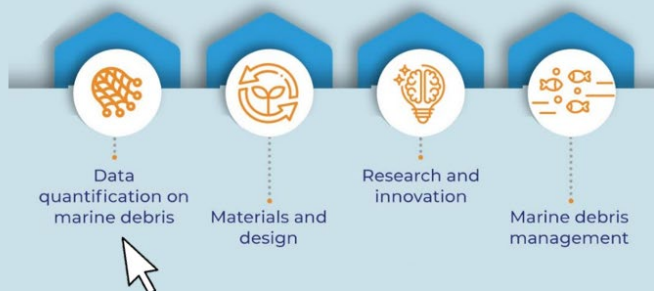
SUPPORT MEASURES

Data quantification on marine debris

1. Generate knowledge on which type of litter comes from which type of aquaculture…
2. Increase synergies among academia, policy makers and farmers …
3. Estimate losses based on the information provided by the farmers…
4. Adapt the list of found items and characterized categories in the standardised monitoring forms…
5. Standardise monitoring protocols and characterization of marine litter derived from aquaculture facilities at a national level
6. Standardise monitoring protocols and characterization of marine litter derived from aquaculture facilities at an international level
7. The standardization protocols and characterization of marine litter should also apply, as far as possible, to the litter produced in inland facilities…
8. Enforce marine litter monitoring in aquaculture plants …
9. Improve the marine litter quantification around the farms…

Figure 10-Example of procedure to be conducted in the different sections of the toolbox when information on standardised forms and procedure is required regarding monitoring and quantification of aquaculture litter with outcome of the suport measures, including Related Barriers and Related Good Practices.

The designs above are a draft of the toolbox. The toolbox might look different once developed.

EXAMPLE 2

I own a finfish aquaculture facility at the North Sea and I want to know if there are any iniciatives with external contractors to collect worn out material like old feeding pipes.

TIDE AGAINST MARINE LITTER TOOLBOX

SUPPORT MEASURES

Support for waste management

1. Put in place various contractual agreements with external contractors to collect used or damaged goods (cardboards and equipment) to be recycled or upgraded

Relevant type of aquaculture:

Relevant sea basin:

North Sea

Related Barriers:

1. There is a lack of efficient systems and facilities for collecting, storing and processing of used gear and equipment.
2. There is a lack of appropriate waste management infrastructures to handle worn out aquaculture and fishing equipment.
3. Recycling companies are located too far from the farm to collect, sort and recycle worn out gear and other waste, which is too costly to integrate into the lifecycle of a farm. This barrier leads to dumping the waste in the garbage without sorting it.
4. Some waste collection centres do not accept to take in the non-organic waste from shellfish producers. A common waste collection policy should be elaborated and enforced.
5. The difficulty of separating different types of materials for recycling purposes.

Related Good Practices:

R&R GP 2.4 - Alternatives for fish bag collection and recycling
In Scotland, feed for fish farming was originally delivered in small 25kg bags. With the new system, the feed is delivered by feed barch in a one ton bag and lifted with a crane into the barch. Feed bags are taken away by the feed delivery boat and recycled. Less opportunity for accidental loss and waste creation.

R&R GP 2.5 - Alternatives for silicon socks
In some regions in France, the damaged silicon socks are being collected for recycling and upgrading as an alternative to a costly deposit at the waste collection centre. This initiative is carried out at no cost and based on a voluntary approach.

Figure 11-Example of the outcome of support measures regarding actions to re-use aquaculture related material. *The designs above are a draft of the toolbox. The toolbox might look different once developed.*

EXAMPLE 3 (BALTIC SEA)

Figure 12- Screenshot of knowledge measures for materials and design regarding the Baltic Sea basin. *The designs above are a draft of the toolbox. The toolbox might look different once developed.*

3.2. Port Reception Facilities (PRF) for aquaculture litter disposal

For this section, data for marinas has not been considered.

Once the user clicks in this option in the main menu of the platform, the flags of the countries that have been included in the Toolbox will be shown. These countries are: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden, Belgium, Spain, France, Italy and Portugal.

Figure 13- Main screen for the Port Reception Facilities (PRFs) section of the toolbox. Flags represent each country with information regarding the PRFs. *The designs above are a draft of the toolbox. The toolbox might look different once developed.*

Once the user clicks in one of the flags, the available information per country will be shown. The displayed information depends on each country, as it follows:

- Denmark: list of the ports with PRF that can be used by the aquaculture farmers.
- Estonia: list of the ports with PRF that can be used by the aquaculture farmers.

- Finland: list of the ports with PRF that can be used by the aquaculture farmers.
- Germany: list of the ports with PRF that can be used by the aquaculture farmers.
- Latvia: list of the ports with PRF that can be used by the aquaculture farmers.
- Lithuania: list of the ports with PRF that can be used by the aquaculture farmers.
- Poland: list of the ports with PRF that can be used by the aquaculture farmers.
- Russia: list of the ports with PRF that can be used by the aquaculture farmers.
- Sweden: list of the ports with PRF that can be used by the aquaculture farmers.
- Belgium: list of the ports with PRF that can be used by the aquaculture farmers.
- France: list of the ports with PRF that can be used by the aquaculture farmers.
- Italy: ports with PRF for aquaculture farmers and fishermen under Fishing for Litter programmes.
- Portugal: Public information of reception facilities available from the Global Integrated Shipping Information System, managed by the International Maritime Organization (IMO)
- Spain: list of autonomous communities with PRF information included in the Toolbox. Once the user clicks in one the Autonomous Community, the port authorities located in that region and managing the Ports of General Interest or the other ports (ports managed by the Autonomous' communities) with / that have provided information regarding PRF will be displayed (see the Spanish section for more detailed information).

Besides, a brief description of the characteristics of the available data is also displayed in the Toolbox, including references to the sources of information and main gaps.

The user can click in the name of one port/one port authority (in the Spanish case) and he/she will get the related specific information, which can potentially include:

- Name of the port/name of the port authority.
- Coordinates.
- Sea basin.
- Type of managed waste potentially related to aquaculture activities.
- Information about fees.
- Information about limitations on the quantity/type of waste.
- Extra information, including:
    a. Clarifications on the information provided.
    b. Information related to MARPOL services potentially linked to the management of aquaculture litter.
    c. Applied regulations.
    d. Fishing for litter schemes in place.
    e. Information about incentives.
    f. Website links.

The information related to **Port Reception Facilities** was obtained from the following sources:

For **Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Russia, France** and **Sweden** the relevant port authorities of larger ports have been approached and their relevant websites, smaller ports have not been contacted although some of them may offer PRFs. Specifically, in the case of France, direct phone calls for large ports on the Channel and North Sea Shore of France have been conducted.

For **Germany** both, large and small ports and their local port authorities have been consulted to collect information; Fishing-For-Litter activities take mainly place at smaller ports; therefore all participating ports have been contacted and background information has been collected from relevant websites provided by the NABU (Nature Conservation NGO).[1]

The information about the PRF in **Belgium/Flanders** was obtained via bilateral consultation with OVAM (Public Waste Agency of Flanders). The new regime under the MARPOL Directive applies to seagoing vessels; aquaculture is not covered. This is different for the SUP Directive, where aquaculture is included.

Information about the PRF in **Italy** was obtained by contacting experts and browsing in internet. The main source of information were:
- Report on Waste Management in Italian Ports by ISPRA, 2015 (https://www.isprambiente.gov.it/files/pubblicazioni/rapporti/R_214_15.pdf)
- Information from data collected by the ML-Repair project in the framework of Interreg Italy-Croatia CBC Programme, co-financed by the European Union from the European Regional Development Fund (2019)
- Contact with ANSEP UNITAM (http://www.ansepunitam.it/) which is the is the Association that groups, at national level, the companies operating in the sector of Port Ecological Services and the Protection of the Marine Environment.

Currently, in Italy there are no specific structures for the exclusive collection of disused nets and fishing and / or aquaculture equipment, as they are collected by port reception facilities pursuant to former Directive 2000/59 /, which is now repealed by the EU Directive 883/2019 and being transposed into italian legal system. The port facilities cd. reception facilities pursuant to EU Directive 883/2019 (and currently in Italy pursuant to Legislative Decree 182/2003 which implemented Directive 2000/59 / EC) and pursuant to Rule 12 of Marpol 73/78 on reception facilities are present in all national ports of the Port System Authority (ADSP) and also in so-called ports. minor offices of Maritime Authorities (eg Port of Rimini). On 17 April 2019, Directive (EU) 2019/883 of the European Parliament and of the Council

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[1]   https://www.nabu.de/imperia/md/content/nabude/meeresschutz/170814-nabu-infopapier-fishing-for-litter.pdf;
https://www.google.com/maps/d/viewer?hl=de&gl=de&ie=UTF8&oe=UTF8&msa=0&t=h&source=embed&ll=54.303704000000025%2C10.041504000000007&spn=2.56436%2C11.403809&z=6&mid=1WdugxR19ANKcLNPQLYsK-PVm_lo

about port reception facilities for the delivery of waste from ships was published. The Member States have 2 years for transposition, therefore until 28 June 2021 (ANSEPUNITAM,2020).

The Italian listed ports in the AQUA-LIT Toolbox were identified in the Report on Waste Management in Italian Ports by ISPRA. Those ports were mentioning facilities for, but not exclusively, waste from fishing activities in their waste collection plans. Other information was gathered by a database collected by the ML-Repair project in the framework of Interreg Italy-Croatia CBC Programme, co-financed by the European Union from the European Regional Development Fund (2019). The information gathered could be not updated since sources are dated to 2015 and 2019.

For **Portugal** information regarding the RPF can be extracted from the Global Integrated Shipping Information System managed by the International Maritime Organization (IMO) which is available at [https://gisis.imo.org/Public/ - Port Reception Facilities - Browse Facilities In a Port.](https://gisis.imo.org/Public/) Here information of each national port for the reception of waste from ships, classified in accordance with the Annexes to the MARPOL Convention is available.

According to **Spain**, the are two main types of Spanish ports:
- Ports of General Interest: these are the larger trading ports in the country. They are managed by the regional (Autonomous Community level2) representative of the Spanish Port Authority of the Central Government.
- Other ports: they are managed by the Autonomous Communities' Port Authorities.

For the purpose of this deliverable, only the ports with available information on their websites or that have provided the PRF data through phone or mail have been included in the database.

Main sources of information regarding the Spanish port reception facilities are:
1. Public information available in the Spanish port authorities' websites (both Ports of General Interest and other ports).

2. Information provided by the port authorities, by email and/or phone.

3. Information provided by official institutions related to waste management.

4. Information provided by the aquaculture farmers.

5. Information provided by the fishermen's guilds.

Nevertheless, it has to be taken into account that the data provided in the AQUA-LIT Toolbox is fragmented and not complete, due to the following circumstances:

1. There is a large number of ports along the Spanish coast. Some of them are managed by the national port authorities, others by regional port authorities.

2. Apart from the national or regional official authority managing the harbour, there are multiple organizations, institutions and companies involved at different levels regarding the litter management, including waste management companies and institutions, fishermen's guilds, research centers and/or NGOs working in fishing for litter or similar schemes, among others. Therefore, the information is fragmented and dispersed and, if available, the way that the institutions in charge generate the data and, consequently, provide it is not uniform.

3. There is a lack of uniformity in the environmental procedures related to waste management at a national level:

    I. Some ports have MSW disposal points and larger item disposal points available for all type of users.

    II. Some ports have MSW disposal points but it is not clear if they can be used by aquaculture farmers or not.

    III. In some cases, the larger item disposal points are segregated by type of material or item, including fishing gear, wood and buoys, among other specific containers. This happens in ports which are located in areas where fishery activities and aquaculture hold a decisive role from the economical point of view.

    IV. Some ports exclusively consider the gear management under the MARPOL directive application. Therefore, they only provide specific gear disposal points for the cargo vessels. Nevertheless, some of the consulted authorities explained that aquaculture farmers' needs could potentially be covered under this directive.

    V. Some ports allow fishermen to leave their gear in the facilities but just to be collected by the officially authorized company which is responsible for the litter management. Fishermen are, therefore, responsible for contacting the waste companies and for depositing the gear in the port installations following the port authority instructions. This type of scheme could potentially be followed by aquaculture farmers.

VI.   In most of the cases, fishermen's guilds play a decisive role in the gear management, especially regarding nets. But it is not clear if the aquaculture needs are taken into account.

VII.   In some ports, other official authorities related to waste management together with NGO's and/or environmental consultancies or organizations play a key role in the gear collection.

VIII.   Finally, some ports do not have, do not know or do not provide any information related to aquaculture gear management.

4.   In general, there is a lack of concern related to the need of providing disposal points for the aquaculture activities.

5.   Usually, the larger aquaculture Spanish farms manage their own waste by holding a contractual agreement with waste management companies. In some cases, the waste management companies are responsible for picking the litter at the installations, while in some cases the litter is brought by the farmers to the disposal points. This is not the case for the smaller companies.

3.3. Funding opportunities related to aquaculture litter management

Relevant funding opportunities (european, national, public and private) for improving littering practices in the aquaculture sector have been collected within Task 5.2 - Funding a wave of opportunity – scope, in order to inform stakeholders about possible funding schemes and mechanisms to which they can apply and potentially get funded to implement their practises for fighting marine litter.

First, European public funding programmes that have funded projects focussed on marine litter in european sea basins in the past 10 years have been collected using EurOcean database Marine Knowledge Gate (KG). The aim is to understand the evolution of funding themes in the marine litter area and try to predict potential areas for investement in the future. This will also be done taking into consideration AQUA-LIT results such as innovative solutions from interviews and Learning Labs and/or new ideas of areas that have never been funded but can have a potential in the future. The analysis will be presented as a report (Deliverable 5.2).

With the support of the consortium, national (Germany, France, Portugal, Belgium, Spain) and regional public funding programmes that have been funded projects related to marine litter in

the past two years (2019-2020) have been collected and displayed in a database in the toolkit specifying:

- Programme name
- Programme type
- Regional scope
- Objective of the programme
- Target (if applicable)
- Eligible institutions (if applicable)
- AQUA-LIT focus (if applicable)
- Link of the programme description

European funding programmes that funded project in the last two years about marine litter projects have been selected from the list extrapolated from KG and included in the database of the toolkit.

Private and public grants, loans and investors of international, national and regional scope will has been collected and displayed in the database specifying the same information (when applicable) mentioned before regarding the public programmes.

The information will be displayed in the most user friendly way possible. The access to the database will be given by three different searching icons: EU flag, screening only EU public funding programmes, national flags, screening all programmes, grants, investors etc. of each nation under analysis (Germany, France, Portugal, Belgium, Spain, and one international symbol for any international grants) and a money bag, screening all grants and investors. In the database, accessing from the different entries, users will be able to filter and select information they need.

Figure 14- Main screen for the Funding opportunities section of the toolbox with the four different programmes and an example of the available list of national programmes projects for all sea basins. *The designs above are a draft of the toolbox. The toolbox might look different once developed.*

3.4. AQUA-LIT Marine Litter Inventory

As part of the background research work, the AQUA-LIT project has provided an overview of the available knowledge on marine litter from the aquaculture sector regarding the North Sea basin, the Mediterranean Sea basin, and the Baltic Sea basin. This information can be found in the [Deliverable 2.2 Knowledge wave on marine litter from aquaculture sources](#).

Moreover, this report provides a description of all aquaculture related items that can be observed as litter in the marine and coastal regions. This litter inventory was generated by a genuine screening of the available literature and litter databases (e.g. OSPAR, HELCOM, Marine Litter Watch) and has been extended and completed during the course of the AQUA-LIT project on the basis of discussions with stakeholders and aquaculture farmers.

The button „AQUA-LIT Marine Litter Inventory" of the main interface of the application leads to the [correspondant section of the AQUA-LIT website](#), which allows the user [to download](#) the inventory or use the online version.
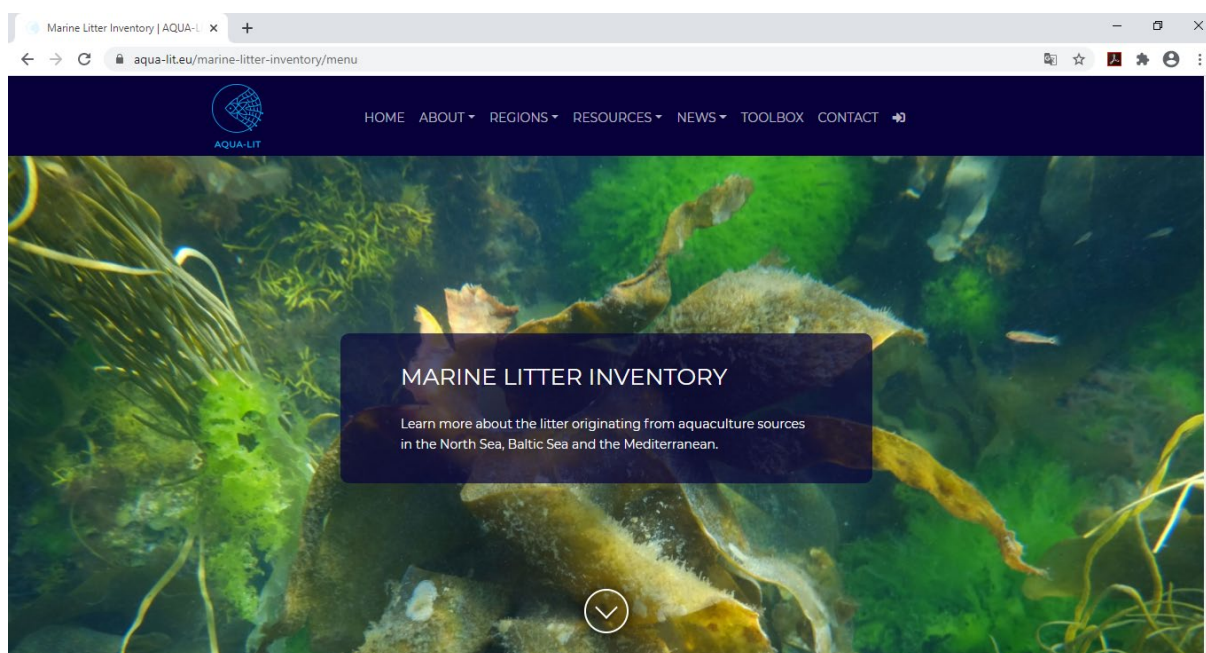
Figure 15- Screenshot of the Marine Litter Inventory main page available at the AQUA-LIT website.

Figure 16- Example of the layout of the Marine Litter Inventory, available from the AQUA-LIT webpage, regarding the plastic fraction.

The online version has four different entryways: search by type of litter, explore by sea basin, explore litter geographically and view online table.
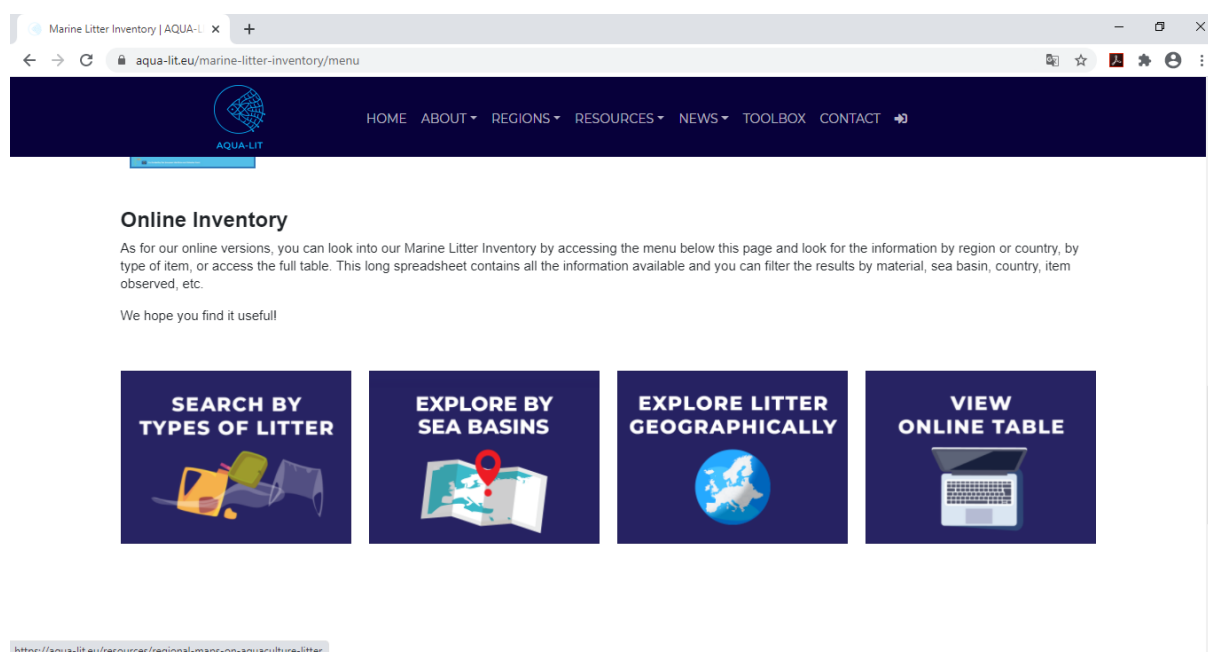
Figure 17- Four entryways to the online Inventory on Marine Litter, product of the AQUA-LIT consortium.

3.5. Submit extra information button

The button for submitting extra information is a tool that can be used by any pre-registered stakeholder to provide more solutions to feed the Toolbox.

This section will be available for the users for 5 years.

The „Submit information" button is located in the main interface of the platform (see figure 17). Once the user clicks on this button, a menu will be displayed in which the user will have to type the following information in order to register to the platform:
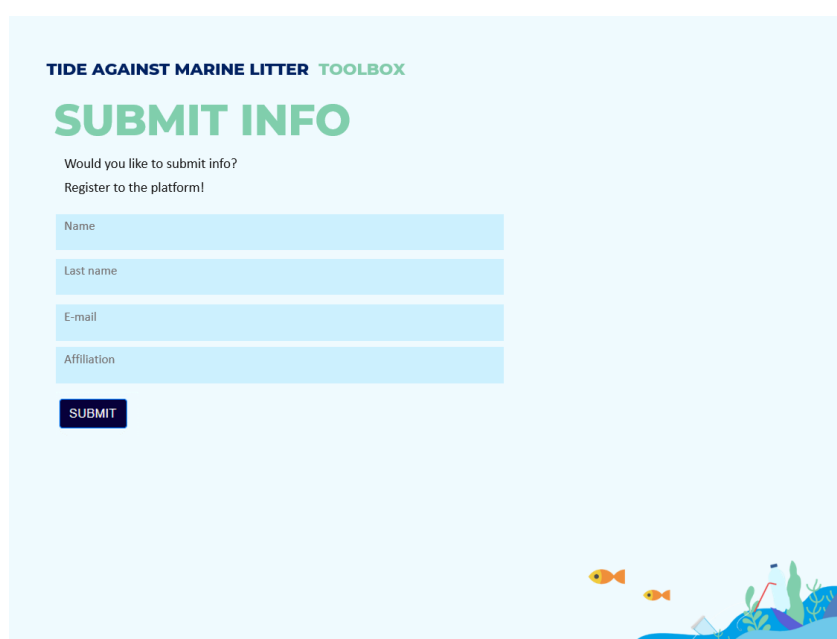
Figure 18- Example of the submit information and fields to fill in of the AQUA-LIT toolbox.
The design above is a draft of the toolbox. The toolbox might look different once developed.

    a.   Name
    b.   Last name
    c.   Contact email
    d.   Affiliation.

Once the user clicks on „Submit" button, a message will be displayed, inviting the user to check his/her email to activate his/her AQUA-LIT account.
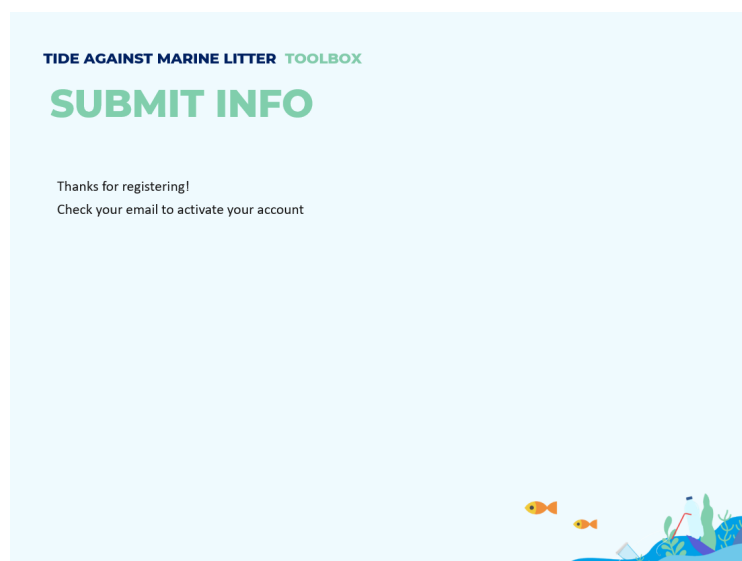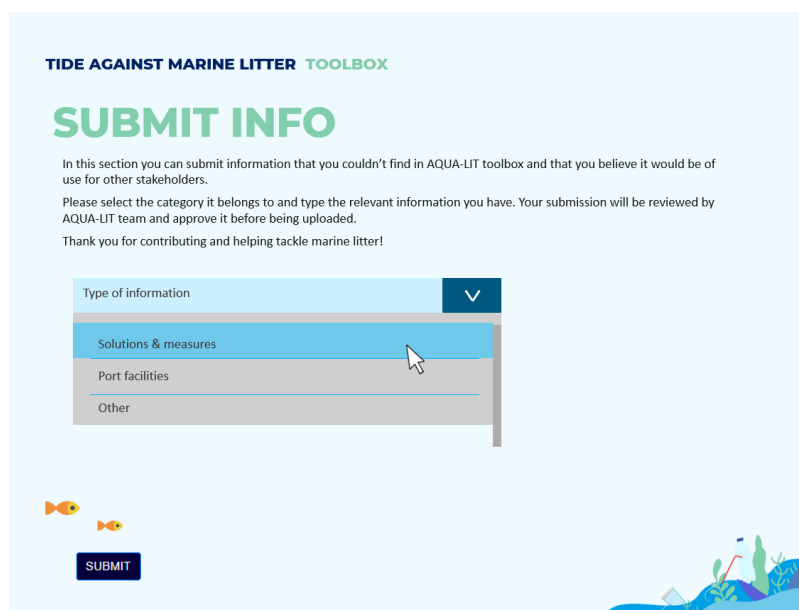
Figure 19- Example of the message that appears once that all submission fields have been filled appropriately. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

All registrations will be automatically accepted. The user will receive an email so that he/she can click on a link to activate the account. Once the account is activated by the user, he/she will have access to the submitting information interface. It has to be noticed that the submitted information will not appear in the platform until the AQUA-LIT administrator approves it. Either approved or rejected, the user should receive a notification.

Regarding the potential information to be submitted, fields to be selected from the main dropdown menu by the user include:

-Type of information (compulsory): the user has to choose among the following options:

    a. Solutions and measures.

    b. Port Reception Facilities.

    c. Other information.
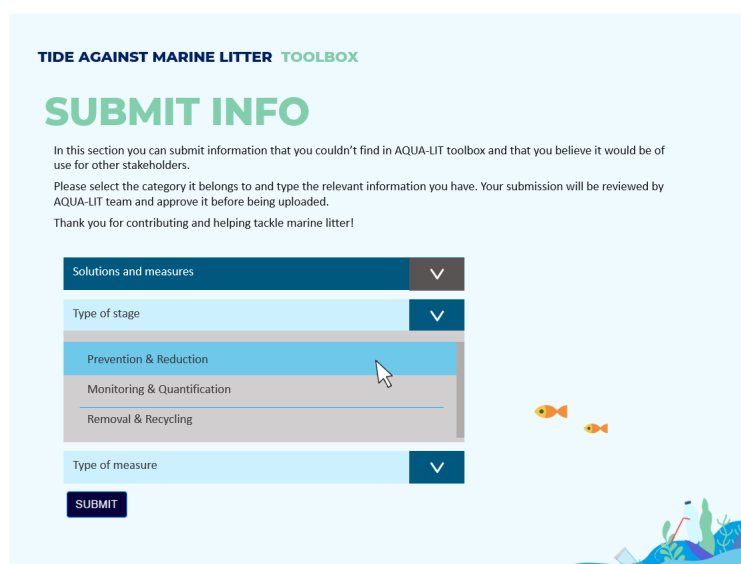
Figure 20- Example of submission form regarding information on solutions and measures not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

If „**Solutions and measures**" is chosen, the following options will be displayed, to be selected by the user:

- Type of stage (compulsory): prevention and reduction or monitoring and quantification or removal and recycling.

Figure 21- Example of submission form regarding information on prevention and reduction not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

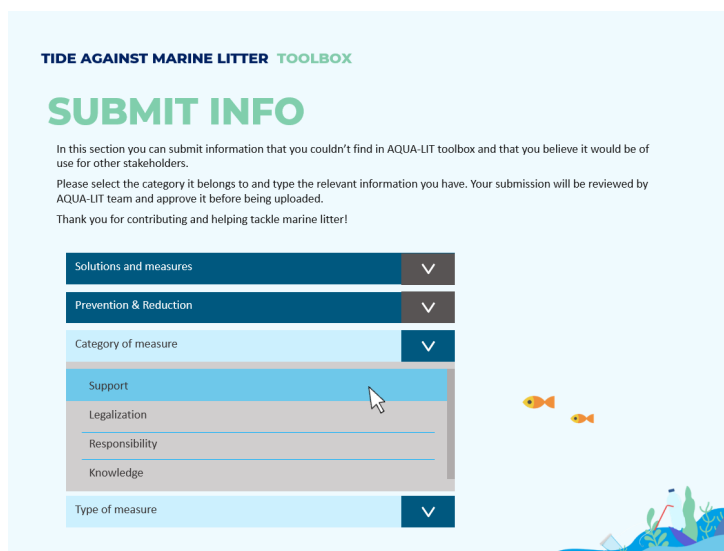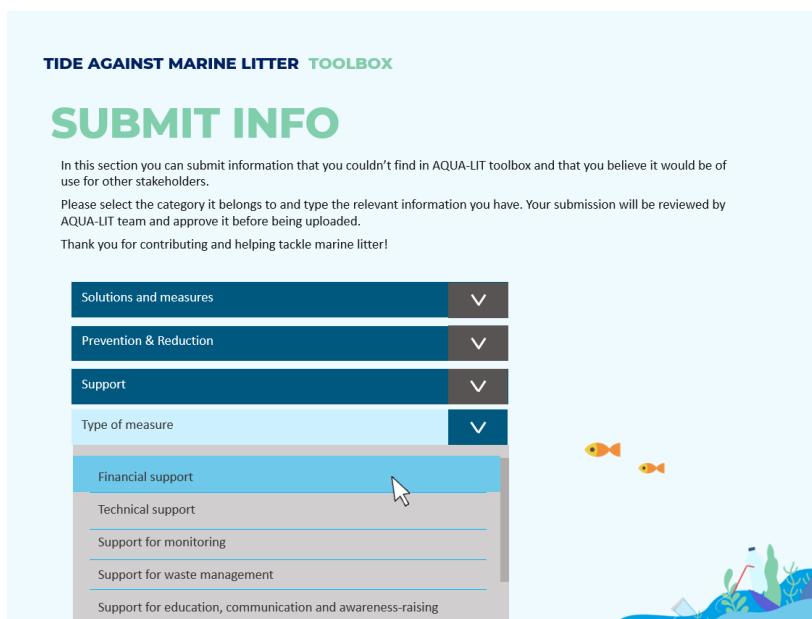- Category of measure (select one) (compulsory): support or knowledge or legislation or responsibility.

Figure 22- Example of submission form regarding information on category of measure not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

- Type of measure (select one) (compulsory):
    i. Under support:
        1. Financial support
        2. Technical support
        3. Support for monitoring
        4. Support for waste management
        5. Support for education, communication and awareness training.
    ii. Under responsibility:
        1. Shared responsibility
        2. Producer responsibility
        3. Farmer/user responsibility
        4. Corporate Social responsibility.
    iii. Under knowledge:
        1. Data quantification on marine debris
        2. Materials and design
        3. Research and innovation
        4. Marine debris management
    iv. Under legislation:
        1. Preconditions for licensing
        2. Regulations
        3. Policy
        4. Harmonisation

5. Certification

Figure 23- Example of submission form regarding information on financial support not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

- Relevant sea basin (multioptional) (compulsory): Baltic and/or Mediterranean and/or North Sea.

Figure 24- Example of submission form regarding information according to sea basin not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

- Type of aquaculture (multioptional) (compulsory): finfish and/or shellfish and/or seaweed.
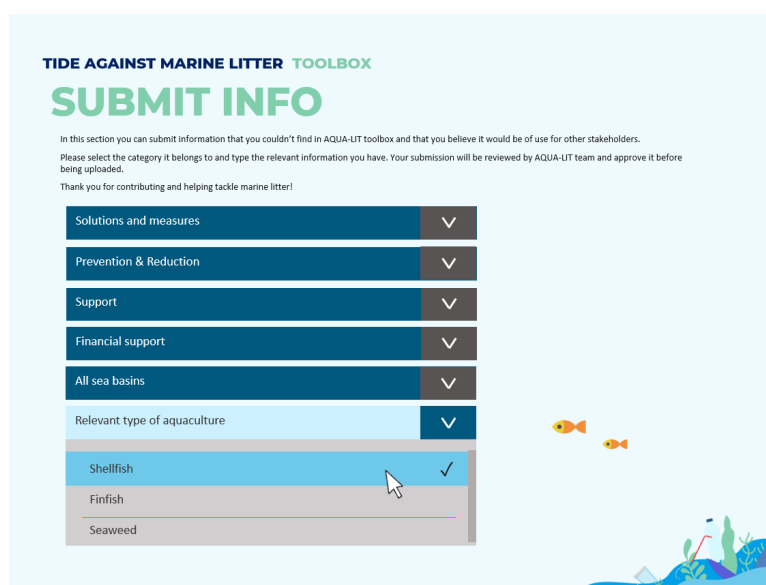
Figure 25- Example of submission form regarding information according to type of aquaculture not available from the AQUA-LIT toolbox and that users consider useful for other stakeholders. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

Afterwards, the name of the solution is typed by the user (compulsory).

Figure 26- Example of submission form indicating available space where users can add information that they consider useful for other stakeholders and which has not been included in the toolbox. *The design above is a draft of the toolbox. The toolbox might look different once developed.*

Then, there is a possibility to type extra information (optional) which would include:
- Linked barriers.
- Stakeholders which are applying the suggested solution.
-Specific good practices.
- Extra information related to governance, for example.

On the other side, if „**Port Reception Facilities**" is chosen from the first dropdown menu of the Submit Info section, the user will have to type the following information:

a. Country in which those Port Reception Facilities are located (compulsory).
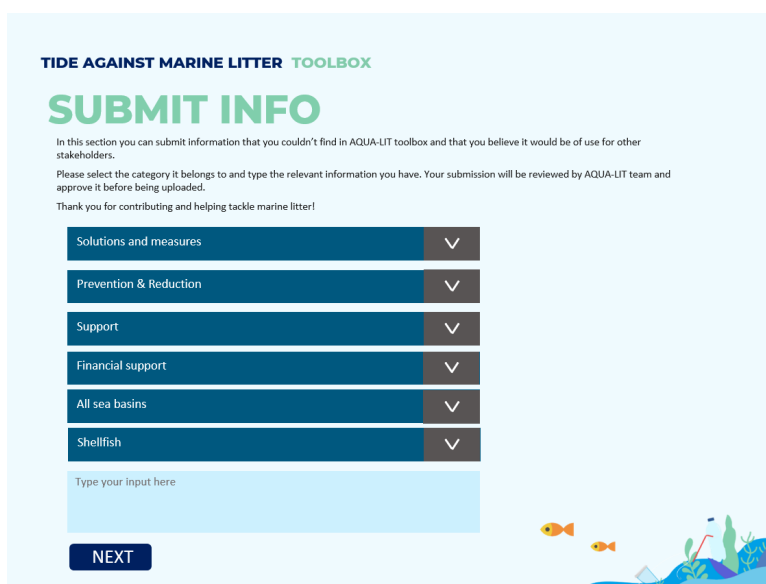
b. City where Port Reception Facilities are located (compulsory).

c. Coordinates (optional).

d. Type of collected litter (multioptional) (compulsory):

I. Aquaculture gear and litter: it includes gear items that come exclusively from aquaculture activities like aquaculture nets, aquaculture buoys, aquaculture pipes, aquaculture ropes, among others. It would also include smaller items like cable ties or meshes.

II. Fishery and/or aquaculture gear and litter: it includes gear and litter that can come from any of these two activities: nets, buoys, pipes, ropes,... and also smaller items like cable ties or meshes.

III. Municipal Solid Waste: it includes the everyday items that are discarded by the public. It can include general waste (not segregated) or segregated collection system like, for example, plastic containers, paper and glass.

IV. Larger items: in some ports they have larger containers in which the port users can deposit the biggest items like nets, buoys or parts of the facility structure like pipes.

V. Other: the user will have to type which kind of litter is collected.

e. Extra information: the user can type any other information that he/she thinks is needed (optional).

Finally, if „**Other information**" is chosen from the first dropdown menu of the Submit Info section, the user will find another dropdown menu in which he/she will have to select among the following options and, afterwards, type the information that he/she wants to submit:

a. Funding opportunities: it can contain information regarding financial opportunities for stakeholders to implement marine litter management related projects.

b. Action plans and policy recommendations: including policy suggestions to improve decision-making and to overcome the existing gaps.

c. Marine litter inventory: suggestions related to any aquaculture items that can be observed as litter in the marine and coastal regions.

3.6. Action Plans and Policy Recommendations

The button for the Action Plans and Policy recommendations leads to the deliverable AQUA-LIT Policy Recommendations.

This report examines how to avert the discarding of litter in the marine environment related to the aquaculture industry. It provides a set of recommendations to improve decision-making and to overcome the existing gaps, being its main objective to provide information to support policy-making of the marine litter problem in the aquaculture sector.

This deliverable was elaborated having in consideration the main key findings and results of each of the three sea basins AQUA-LIT focuses on (the Mediterranean Sea, the Baltic Sea and the North Sea), as well as the project's products and deliverables produced along the project, mainly the Learning Labsreports, the deliverables D.2.2. and D.2.3., and an extensive literature overview, including legislation and policy documents.

Through the works developed under the AQUA-LIT Project, which included an aquaculture public participation process, it was possible to develop a set of 58 important recommendations to be consider by the aquaculture sector in the future. In addition, it was also possible to identify the eight main gaps to overcome the discarding of litter in the marine environment related to the aquaculture industry.

4. Conclusions and recommendations

The aim of the AQUA-LIT Toolbox is to provide integrated frameworks, offer ideas, solutions and facilitate the matching and communication among stakeholders in the aquaculture sectors, to foster more sustainable services, connections and cleaner aquaculture practices.

Actually, some of the identified solutions during the AQUA-LIT Learning Labs were related to the need to increase synergies and enhance communication among stakeholders. This could be done by creating communication channels to help to connect all the involved persons, institutions and organizations with the aim to identify the main needs and priorities in relation to non-organic litter prevention and reduction, and to facilitate sharing the data about the items that have been lost, broken or abandoned by the farmers and the items collected during the marine litter clean-up initiatives.

In this context, the AQUA-LIT Toolbox is a useful application that helps to:

1. Increase the awareness regarding the harm and the impact of non-organic marine litter associated to the aquaculture sector, at all levels: policy makers, waste management organizations, manufacturers, farmers, etc.

2. Involve all the potential stakeholders in the reduction and prevention of marine litter from aquaculture. Clearly identifying the roles and responsibilities of all the involved persons and organizations one of the keys to success to prevent marine litter.

3. Improve the gear identification during the cleaning-up initiatives.

4. Expand potentially applicable good practices and solutions.

5. Identify the knowledge gaps that need to be attended to enforce the technical knowledge of the aquaculture farmers and that need to be filled in by researchers and designers.

6. Identify the policy and regulation gaps across Europe that need to be addressed to enforce the litter management practices.

7. Facilitate the knowledge exchange among all the involved stakeholders.

Therefore, the AQUA-LIT Toolbox aims to be considered the most important knowledge repository for aquaculture-mairne litter related information across Europe and the starting point for the development of new European policies regarding the marine litter coming from aquaculture.