

# PLAYERS AT PLAY



## COUNTRY PROFILE: SPAIN



This project has received funding from the European Union's EASME-EMFF funding programme under grant agreement EASME/EMFF/2017/1.2.1.12/S2/04/S12.789391.



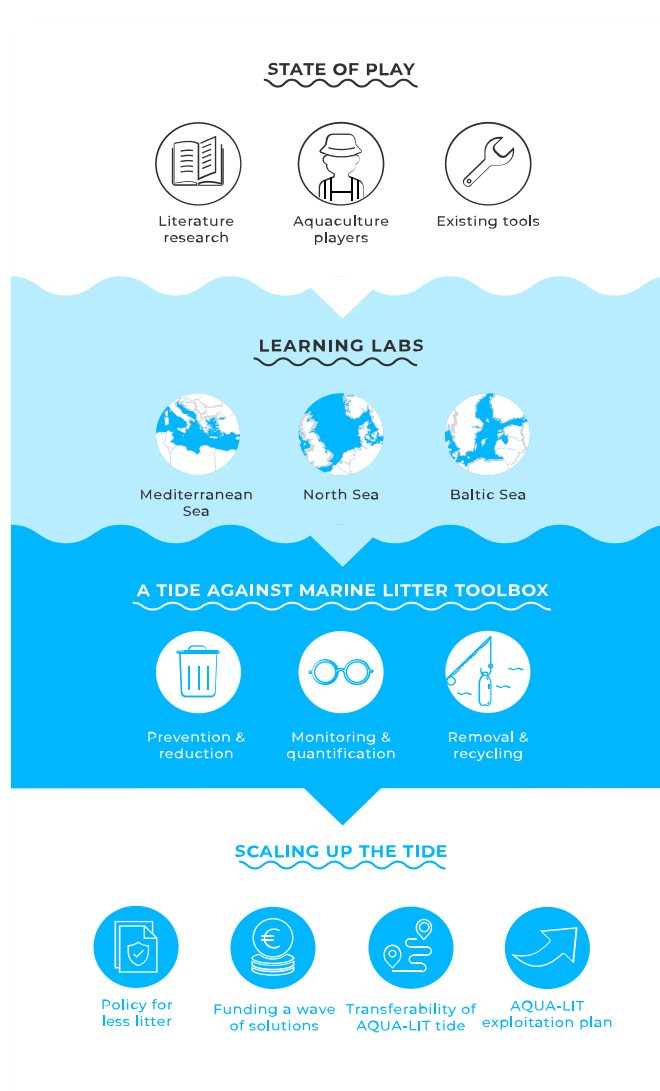
# AQUA-LIT project

**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.



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## 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)



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## AQUA-LIT country profiles

The AQUA-LIT country profiles present a description of the different aquaculture stakeholders, categorised by the four different stages in the life cycle of an aquaculture farm: 1) Initiation, 2) Development, 3) Operation and 4) End of life.

The country profiles were compiled for the two most extensively studied countries in each of the three sea basins of the AQUA-LIT project: Italy and Spain in the Mediterranean Sea, Belgium and France in the North Sea and Denmark and Germany in the Baltic Sea.

The country profiles resulted from various stakeholder engagement processes carried out during the project: the [interactive workshops](#) as well as individual stakeholder interviews. More information on the contributions from the aquaculture stakeholders can be found in the Learning Lab reports of the [Mediterranean Sea](#), the [North Sea](#) and the [Baltic Sea](#).

The country profiles can also be consulted in the annex of the [Knowledge Wave on Marine Litter from Aquaculture Sources](#).



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## Initiation

### Bodies approving the aquaculture technology (classification and certification bodies)

Certification systems are a powerful marketing tool to differentiate certain products and attract those consumers who are looking for more sustainable outputs (Fundación Biodiversidad, 2017).

There are 5 types of available certifications in Spain: environmental, quality, production, social and protected designation of origin. Percentages of certified production companies in 2013 are found in table 1 (which do not include information about the Galician „bateas”) (Fundación Biodiversidad, 2017):

**TABLE 1**

Percentages of Spanish certified production aquaculture companies in 2013.

Types	Certification	% of Spanish certified production companies (2013)	Type of certified species
Environmental	Global GAP	11%	Finfish
	Friend of the Sea	10%	Finfish
Quality	UNE ISO 9001:2008	32%	Shellfish, finfish and seaweed
	Environmental Management Systems	-	Shellfish, finfish and seaweed
	EMAS Environmental Quality	4%	Shellfish, finfish and seaweed
Production	UNE ISO 22000:2005 Food Security	7%	Finfish and seaweed
	European Community Certification on Organic Production (834/2007)	6%	Finfish and shellfish
	UNE 173002:2007 (organic production of rainbow trout)	1%	Rainbow trout
	UNE 173001:2005 (production processes, rainbow trout)	1%	Rainbow trout
	OVN Optimal Vitamin Nutrition	1%	Finfish
Social	OHSAS 18001:2007 Job Safety Analysis	6%	Finfish

Moreover, the Galician Protected Designation of Origin (PDO) certification gathers the majority of the Spanish mussel production: on one hand, the Galician production accounts for 97% of the national production (APROMAR, 2019); and, on the other hand, the Consello Regulador de Mexillón de Galicia, who manages this certification, was concentrating 96% of the „bateas”<sup>1</sup>

<sup>1</sup> „Batea” is the traditional mussel farming system in Galicia (Spain), „(...) a floating nursery consisting of a eucalyptus wood lattice of roughly rectangular shape on which the strings are attached mussel and remains suspended by a system of floats” (Mexillon de Galicia, 2020).

that were in place in that autonomous community in 2008 (the year that this organization was created) (González and Martín, 2014). Quality certification is made following the ISO-17065 international standards and its performed by Bureau Veritas Certification (Mexillon de Galicia, 2020).

Regarding the classification bodies, no information has been found related to specific national guidelines or requirements. Bureau Veritas, DNV GL and AENOR are the most important classification organisations worldwide, and provide the criteria to be applied at a global level.

### **Aquaculture installations, system designing & engineering companies**

In the following section, a general overview of the major Spanish organisations working on installation, system design and engineering is provided, with special emphasis on the debris management topics. Although the concepts of „circular design”, „LCA approach” or „System approach” are starting to be taken into account at this phase, especially at the research level (e.g. in the aquaculture projects funded by the EU), they are not considered and incorporated in all the installation, system designing and engineering companies’ core principles.

In Spain, multiple initiatives focussing on installation, system design and engineering topics are strongly related to technological and research centers. Nevertheless, it has to be considered that most of the corporations that work mainly on constructing aquaculture facilities (especially the international ones) are also involved in innovative design and optimization of engineering solutions for the sector; in the frame of this report, those construction companies have been included in the section Development (under the Contruction headline).

System design innovations have become a priority in the Spanish development frame of the aquaculture. This topic has been included as a Research and Development (R&D) strategic objective in the Spanish [Strategic Plan for Innovation and Technological Development in Fisheries and Aquaculture 2014-2020](#), regarding the Priorities 2 „Aspects of Engineering and Management” and 6 „Environment” (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

In this context, the technological platforms constitute networks in which all stakeholders related to R&D (including technological centers, research centers, associations, public administrations) can participate, enhance the communication and knowledge transfer among all of them. Highlighted technological platforms include the European Aquaculture Technology and Innovation Platform ([EATIP](#)), the Plataforma Tecnológica Española de la Pesca y la Acuicultura ([PTEPA](#)) at Spanish level and technological platforms at a regional level (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

The OESA (Spanish Aquaculture Observatory) holds a database that contains all the Spanish research and development aquaculture centers (public and private) (table 2). These institutions are related to the generation and transference of knowledge of the aquaculture sector on biological research (e.g. farmed species physiology and genetics, animal welfare and nutrition, among other topics), installation improvements, system design and engineering optimization processes.

## TABLE 2

Research and Development aquaculture centers in Spain. Source: OESA database: <https://www.observatorio-acuicultura.es/recursos/bases-de-datos/centros>

Research and development center	Spanish region
AZTI - Acuicultura Marina	Guipúzcoa
AZTI - Alimentaria	Vizcaya
Centro Astacifactoría Rillo de Gallo	Guadalajara
Centro de Astacicultura "El Chaparrillo	Ciudad Real
Centro de Acuicultura San Carles de la Rápita (IRTA)	Tarragona
Centro de Cultivos Marinos de Ribadeo (CIMA)	Lugo
Centro de Documentación en Acuicultura (CDA) - (IEDCYT)	Madrid
Centro de Estudios Avanzados de Blanes (CEAB)	Gerona
Centro de Experimentación Pesquera	Asturias
Centro de Innovación y Tecnología de la Pesca y Transformación de Productos Pesqueros - GARUM	Huelva
Centro de Investigación Agroforestal de Albaladejito (CIAF)	Cuenca
Centro de Investigación en Sanidad Animal (CISA)	Madrid
Centro de Investigación Marina de Santa Pola (CIMAR)	Alicante
Centro de Investigaciones Biológicas (CIB)	Madrid
Centro de Investigaciones Marinas de Corón (CIMA)	Pontevedra
Centro de Recursos Marinos (IMIDA)	Murcia
Centro de Repoblación de Salmónidos (Piscifactoría de Avelle)	Asturias
Centro de Repoblación de Salmónidos (Piscifactoría de In_esto)	Asturias
Centro de Repoblación de Salmónidos (Piscifactoría de Molino de Quiteria)	Asturias
Centro de Repoblación de Salmónidos (Sede Social)	Asturias
Centro de Tecnología y Seguridad Alimentaria (CETESA)	Cádiz
Centro Ictiogénico de Galisncho	Salamanca
Centro Ictiogénico de O Carballiño	La Coruña
Centro Investigación Agroambiental El Chaparrillo - IRIAF	Ciudad Real
Centro Oceanográfico de Murcia	Murcia
Centro Oceanográfico de Murcia (Planta Experimental de Cultivo Marinos)	Murcia
Centro Piscifactoría de Bolinches	Albacete
Centro Regional de Acuicultura "Las Vegas del Guadiana"	Badajoz
Centro Técnico Nacional de Conservación de Productos de la Pesca (CECOPESCA)	Pontevedra
Centro Tecnológico de Acuicultura de Andalucía (CTAQUA)	Cádiz
Centro Tecnológico del Cluster de la Acuicultura de Galicia (CETGA)	La Coruña
Centro Tecnológico del Mar (CETMAR)	Pontevedra
Fundación Centro Tecnológico de Miranda de Ebro (CTME)	Burgos
IEO - Centro Oceanográfico A Coruña	La Coruña
IEO - Centro Oceanográfico de Baleares (COB)	Palma de Mallorca (Baleares)

IEO - Centro Oceanográfico de Cádiz	Cádiz
IEO - Centro Oceanográfico de Canarias	Santa Cruz de Tenerife
IEO - Centro Oceanográfico de Málaga	Málaga
IEO - Centro Oceanográfico de Santander	Cantabria
IEO - Centro Oceanográfico de Santander (Plantas de Investigación en Acuicultura)	Cantabria
IEO - Centro Oceanográfico de Vigo	Pontevedra
IEO - Instituto español de Oceanografía (Sede Central)	Madrid
IFAPA Centro Agua del Pino	Huelva
IFAPA Centro El Toruño	Cádiz
Instituto Agronómico Mediterráneo de Zaragoza (IAMZ)	Zaragoza
Instituto de Acuicultura "Torre de la Sal" (IATS)	Castellón
Instituto de Bioquímica Vegetal y Fotosíntesis (IBVF)	Sevilla
Instituto de Ciencias del Mar (ICM)	Barcelona
Instituto de Ciencias Marinas de Andalucía (ICMAN-CSIC)	Cádiz
Instituto de Ecología Litoral (IEL)	Alicante
Instituto de Investigaciones Marinas (IIM)	Pontevedra
Instituto Gallego de Formación en Acuicultura (IGaFA)	Pontevedra
Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA)	Murcia
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA)	Madrid
Instituto Tecnológico Agrario de Castilla y León	Valladolid
Instituto Tecnológico de Canarias (ITC)	Las Palmas
Instituto Tecnológico para el Control del Medio Marino de Galicia (INTECMAR)	Pontevedra
Laboratorio de Control de Calidad de los Recursos Pesqueros (L.C.C.RR.PP.)	Huelva
Laboratorio de Investigaciones Marinas y Acuicultura (LIMIA)	Baleares
Piscifactoría "La Pesquería"	Burgos
Piscifactoría "La Pesquería" (Sede Social)	Burgos
Piscifactoría "Los Pajares"	Teruel
Piscifactoría de Brieva de Cameros	La Rioja
Piscifactoría del Jerte	Cáceres
Piscifactoría Regional "Rincón de Uña"	Cuenca
Planta Piloto de Acuarios. Servicio Central de Apoyo a la Investigación Experimental (SCSIE)	Valencia

To start with, [CTAQUA](#) provides innovative and customized solutions, with the aim to provide support to the competitive innovation of the aquaculture companies regarding the following topics: food and nutrition; new species; animal welfare and health; environment, including energetic sustainability, organic residues valorisation, adaptation of the facilities to new environmental legislation (e.g. waste management or organic residues management); marketing; and applied engineering related to technological innovations and processes optimization.

[AZTI](#) is a technological center that, among many other topics, deals with aquaculture innovation initiatives. Some of the projects that are or have been carried out are related to marine debris and aquaculture, and include fishery and aquaculture gear recycling and upcycling initiatives (with the aim to reduce the marine debris that comes from both activities in the Bay of Biscay), support to local authorities for marine debris removal and management, development of the Nested Environmental Status Assessment Tool software, research focused on assembling and dismantling „bateas” and long-line operations, support to the implementation of the



environmental footprint analysis in the Mediterranean aquaculture sector, offshore facilities design and farm monitoring systems, among others.

[CETMAR](#) works also in aquaculture projects combining design improvements, optimization systems and environmental criteria. Currently, a project that is focused on the development of innovative solutions to optimize the production and processes of the Atlantic Aquaculture sector using a circular economy approach is being performed, among other initiatives that include, for example, tackling marine debris in the Atlantic areas involving the marine stakeholders, and reduction of the marine debris related to fishery and port authority activities by applying the circular economy approach.

[IMIDA](#) has an aquaculture department with multiple lines of research in which several topics related to process optimization, system design improvements and environmental impact analysis are intertwined: marine aquaculture (based on floating cages) and environmental interaction; economy and technological transferability; floating cages cultures in the open sea; economical optimization of the marine farms; and, finally, researchers and technicians trainings.

Apart from the research centers, there are some companies that focus on the aquaculture facilities and gear design.

In the first place, Española de Plataformas Marinas S.L. ([EXTRUMAR](#)) is a Galician company that works in the creation of multiple innovative „bateas” used both for mussel nurseries and mussel growing, e.g. Extrumar I (made of steel, with an estimated durability of 30-40 years) and Extrumar II (made of polyethylene and aluminium). The company is also involved in I+D+I projects in collaboration with research centers.

Técnica de Envases Pesqueros S.A. ([TEPSA](#)) is another Galician business organization that designs and provides innovative solutions for „bateas” and, besides, long-lines, seaweed platforms and complementary gear. Their products are made of high density polyethylene (PEAD), and pieces can be assembled by the farmer. Emphasis is made on the idea that the PEAD can be reused and recycled.

### **Authorities approving the aquaculture farm (i.e. public authorities)**

In Spain, the autonomous communities<sup>2</sup> exercise exclusive jurisdiction of the aquaculture activities management; this fact was specified in their statutes of autonomy and in the correspondent decrees of powers transferred to the autonomous regions (JACUMAR, 2013). Nevertheless, their regulations are in line with the Spanish national guidelines which are, mainly, the Spanish Constitution, the Law 20/1942 of Promotion and Conservation of the River Fishing, the Law 23/1984 of Marine Cultures and the Law 22/1988 of Coasts (JACUMAR, 2013).

In this scenario, some autonomous communities have developed specific regulations regarding the marine and/or the inland aquaculture activities, while others have mixed them with the fishery regulations (JACUMAR, 2013). Besides, each region assigned its own authority approving the aquaculture projects („órgano sustantivo”) and its own environmental authority that

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<sup>2</sup> The Title VIII of the Spanish Constitution establishes the territorial organisation of Spain, which consists of three levels: the state or central organization, Autonomous Communities and Local Entities (Ministry of Territorial Policy and Public Function, 2020).

evaluates the environmental impact of the projects („órgano ambiental”). Table 3 compiles the authority approving the projects and the environmental authority in charge of the environmental impact evaluation of the facilities in 2018-2019 at an autonomous community level.

In general, an aquaculture promoter of a marine facility has to submit an application to the approving authority and to the authority in charge of the environmental impact evaluation and, if needed, to the local Port Authority (Ministry of Agriculture, Fisheries and Food and JACUMAR, 2016b). Moreover:

- The approval submission can include, depending on each project, an application for a balisage authorization and for maritime-terrestrial public domain occupation.
- Besides, in parallel to the environmental authorization and just if needed, the promoter must submit an application for a dumping authorization to the same environmental authority.

In the case of the inland aquaculture, the farmer has to submit an application for the occupation of the hydraulic public domain and for a dumping authorization to the correspondent autonomous department (which is the same for both applications), and a third one to the authority in charge on the environmental impact analysis. Afterwards, the farmer needs to request authorization from the approving authority (Ministry of Agriculture, Fisheries and Food and JACUMAR, 2016a).

Nevertheless, the Ministry of Agriculture, Fisheries and Food (MAPA) is in charge of the proposals and implementation of the Spanish Government's policies in aquaculture, through the General-Secretariat of Fisheries. The Junta Asesora de Cultivos Marinos (JACUMAR due to the Spanish abbreviations) is an official institution under MAPA which involves the General-Secretariat of Fisheries, the fishery official organisms of the autonomous communities and the representative organizations of the marine aquaculture sector; the main objective of JACUMAR is to coordinate and ensure the cooperation between the national Spanish administration and the autonomous communities institutions regarding marine cultures (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

Regarding the environmental authorization approving the aquaculture facility, the Law 21/2013, December the 9th, of Environmental Evaluation (modified a posteriori by the Law 9/2018, December the 5th) is the national guideline. Firstly, all aquaculture programs developed by the public administration have to be related to the correspondent Ordinary Strategic Environmental Evaluation. Besides, all the intensive aquaculture projects with a production capacity higher than 500 t/year or projects which affect Natura 2000 sites must have a Simplified Environmental Evaluation (EIAS due to the Spanish abbreviation), with the aim to forecast and value the incidence of the activity in the environment. Nevertheless, the cited law is just a guideline, due to the autonomous communities hold the political powers regarding this matter, and they can develop their own regulations.

### TABLE 3

Aquaculture public approving authorities at autonomous community level 2018-2019. Source: Ministry of Agriculture, Fisheries and Food:

[https://www.mapa.gob.es/es/pesca/temas/acuicultura/datos-practicos/gestion-administrativa/Copy\\_of\\_default.aspx](https://www.mapa.gob.es/es/pesca/temas/acuicultura/datos-practicos/gestion-administrativa/Copy_of_default.aspx)

Autonomous community	Marine aquaculture		Inland aquaculture	
	Approving authority	Authority in charge of the environmental impact evaluation	Approving authority	Authority in charge of the environmental impact evaluation
<b>Andalucía</b>	DIRECCIÓN GENERAL DE PESCA Y ACUICULTURA – CONSEJERÍA DE AGRICULTURA, GANADERÍA, PESCA Y DESARROLLO SOSTENIBLE	D.G. DE PREVENCIÓN Y CALIDAD AMBIENTAL – DELEGACIONES TERRITORIALES DE LA CONSEJERÍA DE AGRICULTURA, GANADERÍA, PESCA Y DESARROLLO SOSTENIBLE	D.G. DE GESTIÓN DEL MEDIO NATURAL Y ESPACIOS PROTEGIDOS CONSEJERÍA DEL MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO	D.G. DE PREVENCIÓN Y CALIDAD AMBIENTAL – CONSEJERÍA DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO
<b>Aragón</b>			DEPARTAMENTO DE AGRICULTURA, GANADERÍA Y MEDIO AMBIENTE – INSTITUTO ARAGONÉS DE GESTIÓN AMBIENTAL (INAGA)	DEPARTAMENTO DE AGRICULTURA, GANADERÍA Y MEDIO AMBIENTE – INSTITUTO ARAGONÉS DE GESTIÓN AMBIENTAL (INAGA)
<b>Asturias</b>	DIRECCIÓN GENERAL DE PESCA MARÍTIMA – CONSEJERÍA DE DESARROLLO RURAL Y RECURSOS NATURALES	DIRECCIÓN GENERAL DE PREVENCIÓN Y CONTROL AMBIENTAL – CONSEJERÍA DE INFRAESTRUCTURAS, ORDENACIÓN DEL TERRITORIO Y MEDIO AMBIENTE	DIRECCIÓN GENERAL DE GANADERÍA - CONSEJERÍA DE DESARROLLO RURAL Y RECURSOS NATURALES	DIRECCIÓN GENERAL DE CALIDAD AMBIENTAL - CONSEJERÍA DE INFRAESTRUCTURAS, ORDENACIÓN DEL TERRITORIO Y MEDIO AMBIENTE
<b>Canarias</b>	DIRECCIÓN GENERAL DE PESCA – CONSEJERÍA DE AGRICULTURA, GANADERÍA, PESCA Y AGUAS	DIRECCIÓN GENERAL DE PROTECCIÓN DE LA NATURALEZA – CONSEJERÍA DE POLÍTICA TERRITORIAL, SOSTENIBILIDAD Y SEGURIDAD	DIRECCIÓN GENERAL DE PESCA – CONSEJERÍA DE AGRICULTURA, PESCA Y AGUAS	VICECONSEJERÍA DE MEDIO AMBIENTE – CONSEJERÍA DE POLÍTICA TERRITORIAL, SOSTENIBILIDAD Y SEGURIDAD
<b>Cantabria</b>	DIRECCIÓN GENERAL PESCA Y ALIMENTACIÓN – CONSEJERÍA DE MEDIO RURAL, PESCA Y ALIMENTACIÓN	DIRECCIÓN GENERAL MEDIO AMBIENTE – CONSEJERÍA DE UNIVERSIDADES E INVESTIGACIÓN, MEDIO AMBIENTE Y POLÍTICAS SOCIALES	DIRECCIÓN GENERAL DEL MEDIO NATURAL – CONSEJERÍA DE MEDIO RURAL, PESCA Y ALIMENTACIÓN	DIRECCIÓN GENERAL DEL MEDIO AMBIENTE – CONSEJERÍA DE MEDIO AMBIENTE

Castilla y León			DIRECCIÓN GENERAL DE PRODUCCIÓN AGROPECUARIA E INFRAESTRUCTURAS AGRARIAS – CONSEJERÍA DE AGRICULTURA Y GANADERÍA.	DELEGACIÓN TERRITORIAL DE LA JUNTA DE CASTILLA Y LEÓN DE LA PROVINCIA CORRESPONDIENTE.
Castilla La Mancha			D.G. POLITICA FORESTAL Y ESPACIOS NATURALES CONSEJERÍA DE AGRICULTURA, MEDIO AMBIENTE Y DESARROLLO RURAL.	VICECONSEJERÍA DE MEDIO AMBIENTE DE LA CONSEJERÍA DE AGRICULTURA, MEDIO AMBIENTE Y DESARROLLO RURAL.
Catalunya	DIRECCIÓN GENERAL DE PESCA Y ASUNTOS MARITIMOS - CONSEJERÍA DE AGRICULTURA, GANADERÍA, PESCA Y ALIMENTACIÓN	DIRECCIÓN GENERAL DE POLITICAS AMBIENTALES Y MEDIO NATURAL	DIRECCIÓN GENERAL DE PESCA Y ASUNTOS MARÍTIMOS – DEPARTAMENTO DE AGRICULTURA, GANADERÍA, PESCA Y ALIMENTACIÓN	DIRECCIÓN GENERAL DE POLÍTICAS AMBIENTALES Y MEDIO NATURAL
Ceuta	CONSEJERÍA DE MEDIO AMBIENTE Y SOSTENIBILIDAD	CONSEJERÍA DE MEDIO AMBIENTE Y SOSTENIBILIDAD		
Comunitat Valenciana	DG DE AGRICULTURA, GANADERÍA Y PESCA – CONSELLERÍA DE AGRICULTURA, MEDIO AMBIENTE, CAMBIO CLIMÁTICO Y DESARROLLO RURAL.	DG DE MEDIO NATURAL Y EVALUACIÓN AMBIENTAL – CONSELLERÍA DE AGRICULTURA, MEDIO AMBIENTE, CAMBIO CLIMÁTICO Y DESARROLLO RURAL.	DG DE AGRICULTURA, GANADERÍA Y PESCA – CONSELLERÍA DE AGRICULTURA, MEDIO AMBIENTE, CAMBIO CLIMÁTICO Y DESARROLLO RURAL.	DG DE MEDIO NATURAL Y EVALUACIÓN AMBIENTAL – CONSELLERÍA DE AGRICULTURA, MEDIO AMBIENTE, CAMBIO CLIMÁTICO Y DESARROLLO RURAL.
Euskadi	DIRECCIÓN DE PESCA Y ACUICULTURA – DEPARTAMENTO DE DESARROLLO ECONÓMICO Y COMPETITIVIDAD	DIRECCIÓN DE ADMINISTRACIÓN AMBIENTAL – DEPARTAMENTO DE MEDIO AMBIENTE, PLANIFICACIÓN TERRITORIAL Y COMPETITIVIDAD	DIRECCIÓN DE PESCA Y ACUICULTURA – DEPARTAMENTO DE DESARROLLO ECONÓMICO E INFRAESTRUCTURAS	DEPARTAMENTO DE MEDIO AMBIENTE Y PLANIFICACIÓN TERRITORIAL Y VIVIENDA – DIRECCIÓN DE ADMINISTRACIÓN AMBIENTAL
Extremadura			D.G. DE MEDIO AMBIENTE - CONSEJERÍA DE MEDIO AMBIENTE Y RURAL, POLÍTICAS AGRARIAS Y TERRITORIO.	D.G. DE MEDIO AMBIENTE - CONSEJERÍA DE MEDIO AMBIENTE Y RURAL, POLÍTICAS AGRARIAS Y TERRITORIO.

<b>Galicia</b>	DIRECCIÓN GENERAL DE PESCA, ACUICULTURA E INNOVACIÓN TECNOLÓGICA – CONSEJERÍA DEL MAR	S.G. DE CALIDAD AMBIENTAL Y CAMBIO CLIMÁTICO – CONSEJERÍA DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO	D.G. DE PESCA, ACUICULTURA E INNOVACIÓN TECNOLÓGICA – CONSEJERÍA DEL MAR	S.G. DE CALIDAD AMBIENTAL Y CAMBIO CLIMÁTICO – CONSEJERÍA DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO
<b>Illes Balears</b>	DIRECCIÓN GENERAL DE PESCA Y MEDIO MARINO - CONSEJERÍA DE MEDIO AMBIENTE, AGRICULTURA Y PESCA	COMISIÓN DE MEDIO AMBIENTE DE LAS ISLAS BALEARES – CONSEJERÍA DE MEDIO AMBIENTE, AGRICULTURA Y PESCA	SERVICIO DE CAZA Y PESCA FLUVIAL – DEPARTAMENTO DE COOPERACIÓN LOCAL	DIRECCIÓN GENERAL DE ESPACIOS NATURALES Y BIODIVERSIDAD – CONSEJERÍA DE MEDIO AMBIENTE, AGRICULTURA Y PESCA
<b>La Rioja</b>			DIRECCIÓN GENERAL DE AGRICULTURA Y GANADERÍA – CONSEJERÍA DE AGRICULTURA, GANADERÍA Y MEDIO AMBIENTE	DIRECCIÓN GENERAL DE CALIDAD AMBIENTAL Y AGUA – CONSEJERÍA DE AGRICULTURA, GANADERÍA Y MEDIO AMBIENTE
<b>Madrid</b>			D.G. DE AGRICULTURA Y GANADERÍA – CONSEJERÍA DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO	D.G. DEL MEDIO AMBIENTE – CONSEJERÍA DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO.
<b>Murcia</b>	DIRECCIÓN GENERAL DE AGRICULTURA, GANADERÍA, PESCA Y ACUICULTURA – CONSEJERÍA DE AGUA, AGRICULTURA, GANADERIA Y PESCA Servicio de Pesca y Acuicultura	DIRECCIÓN GENERAL DE MEDIO AMBIENTE Y MAR MENOR – CONSEJERÍA DE EMPLEO, UNIVERSIDADES, EMPRESA Y MEDIO AMBIENTE Secretaría Sectorial de Agua y Medio Ambiente	DG DE MEDIO NATURAL – CONSEJERÍA DE AGUA, AGRICULTURA, GANADERÍA Y PESCA	D.G. DE MEDIO AMBIENTE Y MAR MENOR – CONSEJERÍA DE EMPLEO, UNIVERSIDADES, EMPRESA Y MEDIO AMBIENTE
<b>Navarra</b>			DIRECCIÓN GENERAL DE DESARROLLO RURAL, AGRICULTURA Y GANADERÍA – DEPARTAMENTO DE DESARROLLO RURAL, MEDIO AMBIENTE Y ADMINISTRACIÓN LOCAL	DIRECCIÓN GENERAL DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO – DEPARTAMENTO DE DESARROLLO RURAL, MEDIO AMBIENTE Y ADMINISTRACIÓN LOCAL

One of the most important sections of the environmental evaluations are the Environmental Surveillance Plans (PVA due to the Spanish abbreviation). PVA are designed in the EIAS phase and they are applied when the production starts and while the facility is operating, allowing to correct the gaps in future EIAS and to make more accurate predictions (MAGRAMA, 2012). There is no national official guidelines regarding the aquaculture PVA, apart from the proposed methodology specific for offshore finfish farms (MAGRAMA, 2012), as they are regulated by each autonomous community.

Apart from the documentation that has to be submitted for approval, aquaculture facilities are subjected to complementary legislation and, therefore, reports. To start with, the Law 26/2007, October 23rd, of Environmental Responsibility (developed *a posteriori* with the Decree 2090/2008) incorporated the European Directive 2004/35/CE (April the 21st 2004) and established an administrative regulation of Environmental Responsibility based on the „Polluter Pays” principle. After more than ten years since its application started, it has been noticed that there is a need to reinforce the prevention perspective of the law, with the aim to minimize and reduce the environmental risks of any potentially pollutant activity, including aquaculture (JACUMAR, 2013). The legal development and execution of the law correspond to the autonomous communities.

The Compatibility Reports were regulated with the Decree 79/2019 (February the 22nd), which developed the Law 41/2010, December 29th, of Marine Environmental Protection (incorporating the European Directive 2008/56/CE, June the 17th 2008). All marine aquaculture facilities (growing or fattening any commercial species) need to develop a Compatibility Report regarding the Marine Strategies<sup>3</sup>, and they have to be approved by the [Ministry for the Ecological Transition and the Demographic Challenge](#). Currently, the only reference for the elaboration of this report is the previously cited „Propuesta metodológica para la realización de los planes de vigilancia ambiental de los cultivos marinos en jaulas flotantes” (MAGRAMA, 2012).

There is no specific Spanish regulation regarding the management of the non-organic marine debris that comes from the aquaculture activities. Besides, each autonomous community can have its own specific waste regulation that might be applied to the non-organic marine debris from the aquaculture activities in the frame of the approval procedures.

Nevertheless, some official control mechanisms have been established to ensure the enforcement of the environmental, social, production and hygienic regulations (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019). Each autonomous community has to develop the inspection control plans, based on the [European Regulation \(EU\) No 1380/2013 of 11 December 2013 on the Common Fisheries Policy](#).

More specifically related to marine debris, it has to be mentioned that a national [Guidance for the Minimization of the Subproducts and Debris of the Aquaculture Activities](#) was published in

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<sup>3</sup> Marine Strategies constitute the general framework to which the multiple sectoral policies and administrative actions with an impact on the marine environment must necessarily comply.

2017 (OESA - Fundación Biodiversidad, 2017b), and it is considered as a reference for the waste management in the sector.

As specified in the cited guidance, the management of the aquaculture debris was regulated by the Spanish Law 22/2011, July the 28th, of Waste and Polluted Soils (which incorporated the European Directive 2008/98/CE on Waste) (OESA - Fundación Biodiversidad, 2017b). The waste types included in the Law that are related to the aquaculture activity are (OESA - Fundación Biodiversidad, 2017b):

- Domestic waste: aquaculture debris items that are equivalent to the general household waste.
- Hazardous waste and its containers (e.g. medicine blisters and containers, paints, batteries, among others).
- Bio-waste: comparable to any biological waste that comes from gardens, restaurants or food processing companies.
- Subproducts (excluding animal sources, as they are regulated by the European Regulation nº 1069/2009): any substance or object resulting from the production processes (without being the primary purpose) that can be reused directly (this means, with no subsequent transformation process)

In this scenario, the aquaculture farmer's obligations were identified as follows (OESA - Fundación Biodiversidad, 2017b):

- Ensure the proper treatment of the waste by him/herself or through the authorized waste managers (assuming the costs of the treatment or the management).
- All the owners of aquaculture facilities that produce hazardous waste (except for the smaller ones) have to submit a minimization plan report to the autonomous community.
- Keep the stored waste in good condition, following hygienic and safety recommendations. Hazardous waste can only be stored for six months maximum.
- Avoid mixing or dilute hazardous waste.
- Store, package and label the hazardous waste at the production place and following the regulations.

In the cited guideline (OESA - Fundación Biodiversidad, 2017b), there are some specifications related to the non-organic debris management (included in section 4.3 „Materials, containers and packaging”). For example:

- Reutilization and/or recycling of food packages, mussel nets, etc for non-food uses.
- Reutilization and/or recycling of containers and other items by negotiating with the supplying companies or interested organizations.
- Optimization of the storing conditions in the facility.
- Use of software that can help to manage the product stocks.

There are also recommendations that are not strictly related to the non-organic debris, but that can help to reduce and minimize it, like „using nets made of innovative materials or treated with anti-fouling substances with the aim to reduce the organic residue, to decrease the maintenance net costs” or „scheduling the regular maintenance tasks for the nets”.

Despite the usefulness of the national guidance for the minimization of the subproducts and debris of the aquaculture activities, there will not be an official waste management system of

the non-organic debris from this sector until a specific Extended Producer Responsibility (EPR) system will be in place (Vidal et.al, in progress). The aquaculture (and fishery) gear EPR system should be a result of the development of the Spanish Law 22/2011 and the involvement of more recent European Directives, specifically Directive (EU) 2019/883 on Port Reception Facilities for the Delivery of Waste from Ships and the Directive (EU) 2019/904 on the Reduction of the Impact of Certain Plastic Products on the Environment.

The Ministry of Agriculture, Fisheries and Food (2020b) is responsible for the collection, management and publication of the Spanish Fisheries and Aquaculture Database (PNDB) in the frame of the Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017.

The Establishment for the Collection, Management and Use of Data in the Fisheries Sector and Support for Scientific Advice Regarding the Common Fisheries Policy Council Regulation (EC) No 199/2008 is implemented in the decision D (EU) 2016/1251 of 12 July 2016, which adopts a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019, and in the decision D (EU) 2016/1701 of 19 August 2016 (laying down rules on the format for the submission of work plans for data collection in the fisheries and aquaculture sectors).

This data collection has the aim to support and promote the Common Fisheries Policy, the set of rules for managing European fishing fleets and for conserving fish stocks.

The data categories that have to be included regarding the fisheries and aquaculture sector are environmental, social and economical, being mandatory for the marine aquaculture (and optional for freshwater aquaculture), although „No social and economic data on aquaculture needs to be collected if the total production of the Member State is less than 1 % of the total Union production volume and value. Moreover, no data needs to be collected on aquaculture for species accounting for less than 10 % of the Member State's aquaculture production by volume and value. Additionally, Member States with a total production of less than 2,5 % of the total Union's aquaculture production volume and value may define a simplified methodology such as pilot studies with a view to extrapolate the data required for species accounting for more than 10 % of the Member States' aquaculture production by volume and value” and „No environmental data on aquaculture needs to be collected when the total aquaculture production of the Member State is less than 2,5 % of the total Union aquaculture production volume and value.” (Commission Implementing Decision (EU) 2016/1251, Chapter 5).

Social criteria include, among others, employment by gender, by age, by education level, by nationality and by employment status. Economic criteria include information on incomes, personnel costs, energy costs, raw material costs, repair and maintenance, etc. Environmental criteria involved two variables: medicines or treatments administered and mortalities.



## Development

### Those constructing, bringing, assembling the farm

One of the the first steps for the development of an aquaculture facility is to bring it to the definitive location, construct it or assembly it. In this section, a description of four of the major companies working in those aspects at a Spanish level are described, including information on the types of aquaculture in which they are working.

Most of the companies that work in constructing and assembling the farms also provide the structures, gears and anchoring systems to the farmers. Besides, the majority are also involved in the research and development of innovative design solutions and optimized processes; therefore, all of them could be also included in the previous design and engineering section.

One of the companies working on installation and system constructions at a worldwide and Spanish level in the aquaculture sector is [AKVAGroup](#). They develop their expertise in the finfish cage farming (plastic cages, nets, nets maintenance, camera systems, etc) and finfish land based (fish tanks, fish logistic gear, feeding system design, among others) structures production. Although most of the gear is made with plastic, they make a strong effort in improving the durability and resistance under harsh conditions, e.g. nets made with a type of PET that has very hard surface and, therefore, resists biofouling and makes the net easy to clean in the water; their life cycle can end up, being under the water, after 14 years of use.

[Morenot](#) is also a worldwide relevant finfish aquaculture gear and facility design and installation company also working in Spain. They provide nets, mooring systems (which are highlighted due to they have a reduced number of components and mechanical wear and, therefore, it means a reduced number of inspections and lyfe-cycle costs), ropes, anchors and fixing systems, among other gear. They also provide net maintenance services like washing, disinfection, repair and antifouling.

[Elimat](#) is one of the most important finfish aquaculture gear Spanish companies. Although the central is located in Galicia (Spain), they also deliver in other Mediterranean countries. They design and install marine cages (mostly for European bass, gilt-head beam and Atlantic bluefin tuna), nets, anchoring systems, bouys, etc, a part from facility maintenance.

[TACSA](#) it is another relevant Spanish gear aquaculture company. They work both in the shellfish and in the finfish aquaculture research, development and gear production. They are focused on the design of new biological treatments with the aim to eliminate the solid and diluted pollutants.

[IMA Acuicultura Spain](#) is one of the biggest Spanish companies working on marine aquaculture, providing facilities for farming European bass and gilt-head beam, among other species, and for the tuna fattening process. They designed and patented also the „Batea Medusa” (in 2002), which can be widely used for shellfish farming and for multi-trophic farming (combining finfish, shellfish and algae). IMA Aquaculture Spain do not only design, deliver and install the facilities themselves, but also the anchoring systems and net washer machines, and provide also aquaculture boats. IMA Acuicultura Spain also participates in I+D+I projects related to create and develop multi-trophic systems. The company is located in Galicia, but they work all over

Spain and also at international level, mainly in the Mediterranean region but also in America and Asia.

## Operation

### Aquaculture producers and operators

In the following section, an overview of the Spanish aquaculture producers is developed, including information by type of aquaculture and their most prominent associations.

A total number of 5,100 aquaculture establishments were operating and producing in Spain in 2017 (APROMAR, 2019):

- 4,793 marine shellfish aquaculture farms (“bateas” and long-lines);
- 187 inland and freshwater aquaculture establishments, mainly for rainbow trout (*Oncorhynchus mykiss*) and sturgeon (*Acipenser* sp.);
- 79 farms located on the coast, beaches, intertidal zones and estuaries;
- and, finally, 41 finfish farms at open sea.

The number of aquaculture facilities has reduced over the last years, from 5,313 in 2007 to the current 5,100 (APROMAR, 2019).

Mostly all of the Spanish aquaculture companies are micro – enterprises (employing nine people or fewer, 96.25%) or small – enterprises (between 10 and 49 employees, 3.13%); Micro and small enterprises are usually familiar businesses still using traditional methodologies and equipments. Only 0.58% of the companies could be considered medium-enterprises (between 50 and 249 employees) and only one company has more than 250 employees (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

The number of total Units of Work (UTAs) in the Spanish aquaculture in 2017 was 6,301 but distributed among 16,151 persons (APROMAR, 2019):

- 9,324 were self-employed (mostly related to the mussel sector);
- 3,559 were specialized operators;
- 2,228 were non-specialized operators;
- 701 qualified and medium-qualified technicians;
- 278 office personnel and, finally
- 2,228 were included as non-specialized workers.

In the case of the marine aquaculture sub sector (marine species production including inland, coastal and offshore facilities) the Asociación Empresarial de Acuicultura de España ([APROMAR](#) due to the Spanish abbreviation) is the biggest marine aquaculture federation which, in fact, involves not only finfish, shellfish and algae producers, but also the main Spanish regional associations (Andalucía, Canarias, Galicia, València), feed production companies and also products and services supplying companies (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a).

Moreover, there are two more national aquaculture associations: Asociación Nacional de Acuicultura del Atún rojo (specific bluefin tuna) ([ANATÚN](#) due to the Spanish abbreviations) and the Federación Española de Agrupaciones de Defensa Sanitaria en Acuicultura (focused on

sanitary purposes) ([FEADSA](#) due to the Spanish abbreviations) (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a).

At a regional level, the [Organización de Productores de Piscicultura Marina de Andalucía](#) involves the finfish producers of that autonomous community (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

Regarding specifically to the shellfish sector, the higher association level is noted around mussel farmers. In 2012, 30 mussel producer associations could be found in Galicia, although 2 of them represented 97% of those producers of which, currently (2020), two are still running: Organización de Productores de Mejillón de Galicia ([OPMEGA](#) due to the Spanish abbreviations), which is integrated in the European Associations of Producer Organizations; and the Federación de Asociaciones de Mejilloneros de Arosa y Norte ([FARN](#) due to the Spanish abbreviations) (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a).

In Catalonia there are 4 shellfish producer associations: [Asociación de Productores Bahía Alfacs](#), [Asociación de Productores Bahía Fangar](#), [Asociación de Productores de Moluscos Golfo de Sant Jordi](#) and the Federación de Productores de Mejillón del Delta del Ebro ([FEPROMODEL](#) due to the Spanish abbreviaton) (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a). Finally, the [Agrupación de Clochineros del Puerto de Valencia y Sagunto](#) encompasses the producers in the Valencian autonomous community (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a). The Asociación de Productores de Moluscos de Andalucía (APROMO due to the Spanish abbreviations) involves the mussel producers from Andalucía (Secretaría General de Pesca-Subdirección General de Acuicultura, Comercialización Pesquera y Acciones Estructurales, 2019).

The inland aquaculture producers are represented by two major organizations: the Organización de Productores Piscicultores ([OPP](#) due to the Spanish abbreviations) and the Asociación Interprofesional de la Acuicultura Continental Española ([AQUAPISCIS](#)) (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a). There are two newer associations, the Asociación Nacional de Acuicultura Continental ([ESACUA](#)) and the Asociación de Ciprinicultores y de Acuicultura Continental de Aguas Templadas ([AECAC](#) due to the Spanish abbreviations) (FOESA, 2012; Ministry of Agriculture, Fisheries and Food, 2020a).

### **Aquaculture maintenance and monitoring**

The maintenance of the „bateas” is usually traditional and performed by the shellfish farmers. The owners of the mussel facilities decide which are the criteria to be applied regarding the standards, the procedures and the surveillance regularity (OESA-Fundación Biodiversidad, 2017a; Vidal et.al., in progress). Some of the farmers prefer to substitute the gear and the equipment pieces once a problem has been detected rather than schedule preventive checkings (OESA-Fundación Biodiversidad, 20017a).

In the publication [„Cultivo del mejillon \(\*Mytilus galloprovincialis\*\)”](#) by OESA-Fundación Biodiversidad (2017a), some updated recommendations for the „bateas” maintenance were included, but there was no mention to the potential non-organic debris that is produced during the maintenance tasks and/or during the whole facility life-cyle.

On the other side, monitoring of the offshore finfish facility status may probably be done by the farm divers. Divers have to take note and notify of the general state of the nets, the holes they find and any other incident. Superficial anchoring systems need to be checked daily by the feeding personnel, while the other anchoring systems should be checked, depending on their characteristics, weekly or every 6 months by the farm technicians and divers (Cabello, 2011).

In the case of the finfish farms, maintenance tasks of the gear (cleaning, anti-biofouling treatment, repairing) are usually performed by the same companies that provide the gear, e.g. Akua, Morenot and Elimat.

However, as a consequence of the lack of specific regulations about the non-organic marine debris that is produced while the farms are in operation and the differences among the autonomous communities criteria, the path that the aquaculture debris follows in the Spanish frame is not clear (Vidal et. al., in progress). Currently, the majority of the nets, wood structures, floats and big nails can end up (1) being brought to the large-item waste management collection points (with the consequent fees to be paid by the farmer) or (2) being cut and left in the domestic waste dumpsters, and, afterwards, being transferred to the dumping points or to the incinerator (Vidal et.al, in progress).

## End of life

### Those dismantling the farm installation

Dismantling procedures related to the non-organic marine debris potentially produced in the mussel facilities have been extendedly analysed in the [„Cultivo del mejillon \(\*Mytilus galloprovincialis\*\)”](#) report by OESA-Fundación Biodiversidad (2017a).

In Galicia, once the „bateas” have reached the end of life they are usually placed on the beaches for dismantling purposes, and they are even sometimes left there longer than necessary. The pieces of the facility and aquaculture gear (like floats or wood structures) are occasionally not removed from the beaches once the dismantling tasks have finished. No official procedures are followed to reduce the environmental impact of the multiple types of debris that are produced during the process. Even more, sometimes the „bateas” are just abandoned at the end of their life-cycle (OESA-Fundación Biodiversidad, 2017a).

People in charge of the dismantling process are frequently the shellfish farmers themselves, and sometimes the farm owner gives all the gear, pieces and materials of the facility in exchange for disassembling the „batea” to other people. But, neither in one case or another, an authorised waste manager takes part in the process. Usually, the whole operation does not last longer than 2 days if working 3 persons (OESA-Fundación Biodiversidad, 2017a).

Considering the current environmental legislation and the debris related to the disassembling process, the ideal solution would be building dismantling centers along the Galician coast (OESA-Fundación Biodiversidad, 2017a). The mussel farmer should deliver the facility infrastructure to the center in which all the dismantling process would take place. Once finished, the different types of debris (previously classified and separated) would be delivered to the waste management organizations and, at the same time, a notification would be sent to the government of the Galician autonomous community to notify about the dismantled „bateas” (OESA-Fundación Biodiversidad, 2017a).

No specific information has been found regarding the dismantling process of finfish farms.

### **Those managing/governing the waste management**

In Spain (as it has been noticed previously) there is no specific aquaculture waste management system, nor for the debris that is produced while facilities are in operation neither for the debris that is produced once they have been dismantled.

Currently, the waste management depends on the criteria that each of the autonomous community follows and on the farmer's initiatives (for example, by applying the recommendations included in the national guidance for the minimization of the subproducts and debris of the aquaculture activities, OESA - Fundación Biodiversidad (2017b)).

The Ministry for the Ecological Transition and the Demographic Challenge (Waste Prevention and Management department) holds the power to develop the Law 22/2011, July the 28th, of Waste and Polluted Soils and, therefore, to create the specific EPR systems.

### **Those processing the waste, collection, clean-up**

In Spain, waste collection and clean ups are performed, mostly, by two types of stakeholders, the public administration and the volunteering initiatives.

In 2013, a [standardized monitoring program](#) covering 26 beaches of the 5 Spanish marine demarcations started, fulfilling with the Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008). This monitoring program are performed by the technicians of the General Direction for the Coast and the Sea Sustainability and follows guidelines of the MSFD to account, monitor and characterize debris items found in beaches. Data obtained from these monitoring programs allows to compare debris amounts and quantities obtained from different Spanish beaches, calculate trends and provide systematic information that allows the establishment of measures aimed at reducing the debris that reaches the marine environment. Aquaculture items are included in the category list, although frequently are mixed up with fishery gear.

According to the Spanish law for the Marine Environment Protection, the Spanish Oceanographic Institute ([IEO](#) due to the Spanish abbreviations) was appointed as one of the research centres responsible to conduct scientific activities (assessment, definition of objectives, monitoring programs...) related to the achievement of Good Environmental Status (GES) of the EU's marine waters by 2020 (Law 41/12, December the 29th, article 12). In this sense, according to floating and seafloor debris in the marine environment, the IEO reports data to the Spanish government (Vidal et.al, in progress).

Volunteering initiatives like [Vertidos Cero-MARNOBA](#) are also providing additional data regarding the debris found on the beaches (following a standardized protocol), the floating debris and the items located on the seafloor (both of them still lacking a standardized methodology regarding the data collection).

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