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Barriers

Support

Lack of financial support

- Financial support needed for the development and implementation of innovative and sustainable gear.

Lack of technical support

- Sustainable material design criteria for engineering companies are needed to stimulate the development of alternative gear.

Weak support from governments and decision-makers

- More effort needed for the implementation of incentives/taxes, effective waste management systems, the use of durable materials, the development of guidelines for labelling and quality standards, etc.

Limited initiatives to support education, communication and awareness

- Training and awareness raising are necessary at all levels of the stakeholder chain, for equipment manufacturers, producers, farmers, offshore workers etc.

Legislation

Lack of specific licensing criteria

- Legal procedure for the application of a license often lacks inclusion of adequate technical studies, analysis of local conditions, a list of materials used, a waste management plan, a decommissioning plan etc.

Regulatory obstacles in the national law

- Involvement of several authorities and parallel regulations in national law concerning aquaculture
- Inconsistency in application of environmental criteria between the different autonomous communities within a country
- Lack of specifications on the non-organic debris management
- Lack of national legislation to implement EPR measures in place
- Lack of common recycling regulations for small and large-scale companies, including various, confusing licencing procedures.
- Weak implementation of monitoring and legislation related to non-biological waste

Certification criteria

- Framework and certification for waste management in companies.

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Barriers

Responsibility

Lack of responsibility

- The role and responsibility of all stakeholders regarding the aquaculture marine litter and/or debris issue. This includes lack of responsibility to manage the lost, abandoned and broken items as well as waste items that reached the end-of-life.

Knowledge

Lack of data

- Specific data related to material losses from aquaculture activities, including (1) which items are most frequently lost, broken or abandoned and (2) an estimation of their environmental impact is needed.

Lack of scientific knowledge

- Scientific knowledge related to response of equipment to offshore conditions, sustainable gear alternatives, durability of aquaculture items etc. is needed

Lack of knowledge in relation to innovation

- Lack of knowledge in relation to innovation, including recycling procedures of low value plastic, design of facilities, anti-fouling characteristics, waste valorization, upcycling and recycling opportunities, etc.

Limited knowledge exchange

- Knowledge exchange through interdisciplinary and international collaborations should be promoted and widely supported

Lack of knowledge how to implement EPR measures

- Knowledge on implementation of foreseen EPR measures on company level is needed.

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Solutions

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Support

Financial support

- Incentivize the development and implementation of sustainable innovative design of materials and equipment.
- Improve resource productivity in the sector by funding tendering of competition with prize money to accelerate closed loop approaches.

Technical support

- Develop tailor-made standards, guidelines and procedures for different types of companies working on sustainable design/ engineering solutions for de-commission, re-use, re-purposing to be considered early on in the design stages of a system.
- Develop circular design targets to extend the aquaculture installation's life cycle and promote multiple use of the entire installation or major parts.
- Improve marine litter quantification protocols around the farms.

Support for monitoring

- Incentivize innovative approaches for (seabed) monitoring using specific technologies (underwater drones, robots, aerial monitoring).
- Develop guidelines for monitoring programmes based on the Life Cycle Analysis of the materials and infrastructure put in place.

Support for waste management

- Incentivize innovative approaches for automated (seabed) waste collection systems, etc.)
- Establish waste collection points for aquaculture gear disposal in the port reception facilities, while cooperating with other sectors to achieve larger amounts of waste.
- Create deposit schemes for cages and passive aquaculture gear.
- Support valorization trajectories of the waste market and creating incentives for recycling companies to develop sustainable procedures.
- Promote upcycling processes to ensure the economic viability of the 5R's.
- Develop waste flows which include as many different types of polymers as possible.

Support for education, communication and awareness-raising

- Technical trainings for aquaculture staff with gear production companies
- Trainings to identify non-organic marine litter from the aquaculture sector
- Communication on good practices applied by the aquaculture sector
- Promotion of clean-up volunteering programs
- Cooperation between offshore sectors and between large and small aquaculture farms

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Solutions

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Legislation

Preconditions for licensing

- Include information on quality standards of materials, technical studies and a waste management plan in the license application process.
- Include the identification of potential sources of waste, the estimation of non-organic marine litter related to the facility and the monitoring of the litter in the license application process.
- Incorporate the decommissioning process in the licensing process, includin funds for farmers, and ensure compatibility with plastic waste legislation and mandatory reporting of losses.

Regulations

- Create a specific Spanish Single-Use-Plastic regulation and Extended Producer Responsibility scheme regulation for fisherie and aquaculture.
- Perform inspections to enforce regulations and deny concession renewals if criteria are not met.

Policy

- Incorporate the European Directive 2019/904 on the reduction of the impact of certain plastic products on the environment into national law.
- Expand the current environmental objectives of the Marine Strategies to include the criteria of monitoring marine litter (related to descriptor 10 - MSFD) in the Compatibility Reports.
- Develop national aquaculture law with clear guidelines for the procedures in marine coastal or offshore farms as well as different farming systems.
- Implement the revised Port Reception Facility Directive into national laws with a focus on easy to handle container systems free of charge.

Harmonisation

- Establish common standardised licensing procedures for various types of aquaculture across the EU in a clear and cohesive format to especially support small-scale farmers.
- Harmonise certification systems, including waste management plans.
- Harmonise as much as possible the criteria of the multiple autonomous communities regarding waste management in Spain.
- Harmonisation of decommission to avoid unfair competition between Baltic Sea Region countries; mandatory reporting of losses.

Certification

- Standardise the labelling systems for aquatic and food products to inform consumers about the environmental impacts of the products; allow labelers to expand on specific requirements or criteria for specific clients.

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Solutions

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Responsibility

Shared responsibility

- Identify the role and responsibility of all the stakeholders involved in the waste management process/EPR scheme.

Producer responsibility

- Identify the producer responsibility regarding recycling or returning facilities for farmers.
- Good practice certification control points should be feasible to be implemented by producers, based on the official regulations and feasible to be verified by the certification bodies.
- Encourage the adoption of good practices by positive economical stimuli, such as tax reduction or fiscal incentives.

Farmer/user responsibility

- Create surveillance plans which include checking the state of the aquaculture facilities regularly
- Fill in a logbook, keeping track of the bought items, installed and/or used items, the major events happened and any gear loss or break.
- Financial incentives, e.g. to the companies that have a higher proportion of gear recycling and reusing.
- Apply penalties to the companies that do not put in place prevention measures and/or do not discard properly the gear that has reached the end-of-life

Corporate Social Responsibility

- Include the circular economy approach when designing and producing any aquaculture gear and facility or when choosing any material.

Knowledge

Data quantification on marine debris

- Create synergies among all aquaculture stakeholders to (1) increase the knowledge related to the aquaculture marine debris and, (2) to improv and increase the current marine debris data quantification and methodologies.

Materials and design

- Enhance scientific knowledge on new materials and new designs for aquaculture equipment, including detailed analysis of technical characteristics and the life time of aquaculture gear and equipment etc.

Research and innovation

- Enhance knowledge in relation to innovation, including waste recycling processes, low value plastic recycling, material design in function of improved longevity, etc.
- Promote interdisciplinary and international collaborations by funding R&I projects between companies and academic partners.

Marine debris management

- Create synergies among all the involved stakeholders to identify
  (1) the farmer's needs regarding the aquaculture marine debris management,
  (2) the necessities to create a functional EPR scheme and
  (3) the market value of the recycled and upcycled products, with the aim to create a feasible EPR scheme.