

CONTRIBUTION OF ACCESS2SEA TO A MORE COMPETITIVE AND SUSTAINABLE AQUACULTURE IN THE ATLANTIC AREA

www.access2sea.eu

ACCESS2SEA PROJECT RESULTS

CONTENTS

1. DEFINITION OF A FRAMEWO DEVELOPMENT OF ACCESS2S THE ATLANTIC AREA

1.1 What is Interreg Atlantic Area?

- INTRODUCTION AND BACKG
 2.1 Aims of the project
 2.2 The common challenge
- 3. METHODOLOGY AND STRATE COMPETITIVE AND SUSTAINA GROWTH IN THE ATLANTIC A

3.1. Transfer methodologies in Spati3.2. Social Acceptance Strategy3.3. Access2Sea Technology Transfer

4. ACCESS2SEA BEST PRACTICE
4.1. Social Acceptability
4.2. Spatial planning

5. PILOTS PROJECT

5.1 Pilot 1: Experimental approach to
5.2 Pilot 2: Aquaculture activities ins
5.3 Pilot 3: Sustainable aquaculture a
5.4 Pilot 4: Aquaculture activities so
5.5 Pilot 5: Feed Intake Regulation a
in Fish Production

- 6. MAIN RESULTS AND CONCLU
- 7. DISSEMINATION AND COMM 7.1. Capitalization 7.2. Communication Materials
 - 7.3. Networking

RK FOR THE SEA: ACTION PLANS FOR	4
ROUND OF THE PROJECT	8
EGIES FOR A MORE BLE AQUACULTURE REA al Planning	10
er Roadmap	
S IN THE ATLANTIC AREA	14
o expertise new aquaculture sites stallation activities cial acceptance as a Tool for Waste Management	17
SIONS	24
JNICATION	26

1 DEFINITION OF A FRAMEWORK FOR THE DEVELOPMENT OF ACCESS2SEA:

ACTION PLANS FOR THE ATLANTIC AREA



The Atlantic Strategy and the 2013 – 2020 Action Plan

In 2011 the European Commission adopted an Atlantic Maritime Strategy in response to repeated calls from stakeholders for a more ambitious, open and effective cooperation in the Atlantic Ocean Area. The strategy, consistent with the EU 2020 agenda and its flagship initiatives, grouped the identified challenges and opportunities facing the Atlantic region under five main thematic headings.

The EU's 2013-2020 Atlantic Action Plan set out practical steps to be taken in the 5 Member States with Atlantic coasts (Ireland, France, Portugal, Spain and UK) and their outermost regions in order to boost the Atlantic Ocean Area's sustainable blue economy by 2020. Its priorities were:

- Promote entrepreneurship and innovation.
- Protect, secure and enhance the marine and coastal environment.
- Improve accessibility and connectivity.
- Create a socially inclusive and sustainable model of regional development.



1.1 WHAT IS INTERREG ATLANTIC AREA?

As part of the European Union's Cohesion Policy, Interreg Atlantic Area supports transnational cooperation projects in 36 Atlantic regions of 5 countries: France, Ireland, Portugal, Spain and the United Kingdom, contributing to the achievement of economic, social and territorial cohesion. The Programme overall objective is to implement solutions to answer to regional challenges in the fields of innovation, resource efficiency, environment and cultural assets, supporting regional development and sustainable growth.

With a total budget of EUR 185 million, which comprises a fund allocation above EUR 140 million from the European Regional Development Fund (ERDF), the Programme focuses on four main priorities axes and specific objectives related.

PROGRAMME PRIORITIES:



Priority 1:

Stimulating innovation and competitiveness (EUR 62.8 million)



Priority 2:

Fostering resource efficiency (EUR 39.7 million)

Priority 3:

Strengthening the territory's resilience to risks of natural, climate and human origin (EUR 20.3 million)

Priority 4:

Enhancing biodiversity and the natural and cultural assets (EUR 52.6 million)

Priority 5:

Technical Assistance (EUR 9.9 million)





PROJECT TITLE: PROJECT TITLE: NEW OPPORTUNITIES FOR MORE COMPETITIVE AND SUSTAINABLE BLUE GROWTH IN THE ATLANTIC AREA.

ACRONYM: ACCESS2SEA

PROGRAMME: **INTERREG ATLANTIC AREA**



Partners from Spain, Portugal, France, Ireland and United Kingdom



SPAIN

Fundación Bahía de Cádiz para el Desarrollo Económico Fundación Centro Tecnológico de Acuicultura de Andalucía



Swansea University



Údarás na Gaeltachta Innovation & Management Centre WestBIC



Centro Interdisciplinar de Investigacao Marinha e Ambiental da Universidade do Porto





PORTUGAL



Duration: March 2019 to February 2023.



Lead partner: Fundación Bahía de Cádiz para el Desarrollo Económico (CEEI Bahía de Cádiz), Spain.



Total Project Budget: Access2Sea is a project, co-financed 75% by ERDF through the Interreg Atlantic Area Programme. • ERDF: 1.400.329,44 € • Total Costs: 1.867.105,32 €



Associated partners from France, Spain and Ireland.

2. INTRODUCTION AND PROJECT BACKGROUND

2.1 AIMS OF THE PROJECT

The main objective is to promote the exploitation and preservation of the natural assets of the Atlantic Area through:

1

Release existing regulatory, technological, acceptability and planning barriers to new and ongoing investment in the sector. Disseminate existing and new technical, planning and development solutions to current challenges.

Marine aquaculture (fish, shellfish, algae farming) is a leading sector of the Blue Economy of the Atlantic Area that has an important tradition in many EU countries and is relevant on many of its coasts. Aquaculture has the potential to boost economic development and job creation by the sustainable exploitation of the Atlantic Area natural assets. As only 10% of the seafood on the Atlantic coast is of aquaculture origin, there is a great opportunity to increase the aquaculture production in this area.

AQUACULTURE INNOVATION HAS

A KEY ROLE to play in the success of blue growth and sustainability, contributing to competitiveness as well as protecting and providing services to marine and coastal ecosystems. The aquaculture industry is looking for alternatives that promote economically profitable farming with a very low environmental footprint, committed to animal welfare and nutritional quality of the product.

ACCESS2SEA enhances the attractiveness of the Atlantic coast for aquaculture SMEs by enabling new business opportunities and providing sustainable and easier access to it.



3

Provide support to aquaculture SMEs with the aim of creating new and sustainable investment opportunities for them in the Atlantic Area. Enhance cooperation between stakeholders to improve collaborative relationships and facilitate innovation and knowledge transfer in the aquaculture sector.

2.2 THE COMMON CHALLENGE OF THE PROJECT

The common challenge addressed by the project is the need to improve the performance, sustainability and social acceptance of the Aquaculture activities and business, once this sector potential was not yet fully unlocked in the Atlantic area.

To achieve the specific objectives proposed, the project **combines four areas of intervention.**

In this context Access2Sea is incharged of reinforcing the fact that the Member States of the EU are leaders in technology and research, have well-trained human resources, and the environmental conditions are appropriate for growing many of the species most demanded nowadays by the consumers.

3. METHODOLOGY AND STRATEGIES

FOR A MORE COMPETITIVE AND SUSTAINABLE AQUACULTURE **GROWTH IN THE ATLANTIC AREA**



"

This methodological guide details and explains all the steps to launch a project: from ratios and data to technical and legal indicators.

One of the objectives of Access2Sea is to improve the business environment and the growth and job creation of the aquaculture sector in the project territories. To this end, aquaculture companies and related entities in the different regions have been involved in the progress of the project through a series of strategies.

3.1 TRANSFER METHODOLOGIES **IN SPATIAL PLANNING**

Investir in Finistère with its partner Technopole Quimper-Cornouaille and with the support of professional federations and experts had published a guide to support aquaculture farms to set up an onshore aquaculture site with sea water supply. This methodological guide "Access2Sea's experimental approach to testing new aquaculture sites" details and explains all the steps to launch a project: from ratios and data to technical and legal indicators, including practical analysis grids.

This methodology provides relevant information to:

• Entrepreneurs embarking on an aquaculture project on land that requires seawater pumping, either linked to an offshore concession or on their own and in different activities: shellfish farming. algae farming, fish farming, marine biotechnologies according to your specific needs.

• Technicians from public organizations and communities who are supporting a project in their territory or who wish to equip a site.

Access2Sea's experimental approach to testing new aquaculture sites is an open access document available at project website.

3.2 SOCIAL ACCEPTANCE STRATEGY

Access2Sea created a social acceptability strategy, defining objectives action lines and indicators in order to highlight the sector's sustainability and the importance of fish consumption. Thus, contribute for changing of public opinion, through:

• Regional campaigns for changing the image of aquaculture fish within the consumers.

• The support of the administration to the companies using socially responsible techniques and ecologically sustainable.

The elaboration of the acceptance strategy plan was based on the results obtained from the SWOT analysis and after considering the cases of success detected (available in section 4.2).

ACCESS2SEA SOCIAL ACCEPTANCE STRATEGY



S

ш

Z

CTION

<



2
∠]

Strategic Line



GOVERNANCE ASPECTS

A.L.1 Technical workshops about removable installations and offshore aquaculture

A.L.2 SME Support for Business Development, Planning and Licensing

A.L.3 Jointly definition of fiscal or social benefits for sustainable aquaculture producers

ACCESS2SEA TECHNOLOGY TRANSFER ROADMAP 3.3

As part of the work program, this action involved the Project Partners who committed themselves to researching and analyzing new aquaculture techniques that are being developed in their regions. This research aims to promote a more sustainable industry by facilitating the dissemination of techniques that may be of value to meet the needs of companies in other territories of the Atlantic Area Region.

A Technology Transfer Roadmap was developed as part of the Access2Sea Business Models work package. This is a methodology for the transnational transfer of sustainable business techniques across the partner regions.



KEY LEARNINGS FOR DEVELOPING THE AQUACULTURE SECTOR:





A COMPETITIVE, 1 SUSTAINABLE ROUTE TO MARKET SHOULD BE **AVAILABLE**.

The access route to market or its competitiveness market may change over time

- **PUBLIC INVESTMENT IS** 2 **REQUIRED TO ENSURE AN ENABLING ENVIRONMENT** FOR BUSINESS TO **COMMENCE AND THRIVE.**
- 3 **ENABLE THE AVAILABILITY AND USE OF TECHNOLOGY.** to enhance production

techniques, quality, innovate and grow the business.

- **A** INCUBATOR AND capacities.
- **MAXIMISE THE R&D FACILITIES**





ACCELERATION **PROGRAMMES FOR AQUACULTURE SECTOR** will be helpful in supporting the business development

CONNECTIONS WITH LOCALLY, NATIONALLY AND INTERNATIONALLY.

FOSTER DIRECT SALES: LESS QUANTITY FOR **MORE PER UNIT.**

7 ENCOURAGE THE EVOLUTION OF AOUACULTURE SPECIFIC FINANCIAL **INSTRUMENTS**

that recognises risks and timetables associated to the sector (until the business demonstrates its capacity to engage with normal finance providers)

SUPPORT THE DEVELOPMENT OF CULTURALLY SENSITIVE BUSINESS MODELS that maximise horizontal and vertical integration

in the value chain where appropriate.

4. BEST **PRACTICES OF** ACCESS2SEA IN THE **ATLANTIC AREA**

4.1 SPATIAL PLANNING

In order to boost the sustainable development of the aquaculture sector, access to areas for aquaculture installation is essential. Nevertheless, territorial management is dealing with use conflicts for marine space (such us tourism, small-scaled fisheries, maritime transport...) and water supply.









4.2 SOCIAL ACCEPTANCE

In this section, we focused on the area of Social Acceptance where the partners have initially worked on identifying success cases. In order to detect the weaknesses, threats, strengths and opportunities of the aquaculture sector in the Atlantic Region a SWOT analysis was carried out.



Once the analysis has been carried out, six case studies have been identified to help assess the current situation of the sector with the aim of analyzing what aspects can improve social acceptance in aquaculture.

- CASE STUDY 1: Promotion of Aquaculture Sea Bream in Madeira Island (Portugal).
- CASE STUDY 2: The Salmon Aquaculture Industry in Chile.
- CASE STUDY 3: The European Campaign about Aqualculture to promote fresh, local, healthy fish and shellfish from the farmers in the water -#FarmeintheEU.



- CASE STUDY 4: Social Acceptability in Aquaculture in Monastir's Bay: Tunisia.
- CASE STUDY 5: Breizh Mer: Social Acceptability of Offshore Windmills in Brittany.
- CASE STUDY 6: The Social Acceptability Strategies on renewable energy project on the French Coastal Area.

5. PILOTS PROJECTS





Based on the results of the work carried out during the execution of the project, the partners have worked together, sharing their knowledge, experiences, methodologies and tools, to develop pilot projects that must respond to the key fields of the project:

- Take advantage of business opportunities detected.
- Support sustainable aquaculture activities (new and existing).
- Improve the social acceptance of these activities.

The knowledge generated by the development and implementation of the pilots has been disseminated through scientific articles and technical reports where the main results and areas for improvement are presented.

THE ACCESS2SEA PILOTS:



PILOT 1: EXPERIMENTAL **APPROACH TO EXPERTISE NEW AQUACULTURE SITES**



PILOT 2: AQUACULTURE ACTIVITIES INSTALLATION



PILOT 3: SUSTAINABLE AQUACULTURE ACTIVITIES



PILOT 4: AQUACULTURE ACTIVITIES ON SOCIAL ACCEPTANCE



PILOT 5: FEED INTAKE **REGULATION AS A TOOL FOR** WASTE MANAGEMENT IN FISH PRODUCTION



AIM. This pilot action aims to:

- Increase the knowledge and skills of the project partners regarding the identification of the best sites and technical requirements for installing aquaculture projects.
- Raise awareness of public authorities in local areas to consider the installation of aquaculture activities through clarification on the stage required to install an inland aquaculture site in coastal areas.

TASKS:

In order to verify the suitability of an aquaculture site, the profitability of the project regarding the supply of raw seawater and the discharge of treated water must be examined. The process to identify methodological steps was obtained from the use of different criteria:

- Regulatory Constraints
- Implementation facilities
- Conditions of establishment / exploitation

- Pumping conditions
- Water Quality
- Risks of conflict of use

RESULTS

Thanks to the support of local aquaculture stakeholders and a consortium of aquaculture consultancy firms, a technical document has been elaborated that explains the different stages to be analysed when installing an inland aquaculture site.

The document is published as "Methodological guide: set up an on-shore aquaculture site with sea water supply". It is destinated to aquaculture entrepreneurs and technicians of public organizations in coastal areas that can support creations of aquaculture sites in their territory.

This guide was distributed in English and French.



PARTNERS:

CTAQUA AND CEEI

AIM

The main objective is to provide a local SME with macroalgae cultivation techniques and advice to improve its productivity, sustainability and profitability, through:

- species diversification proposal to include macroalgae culture, technical and commercial alternatives.
- implementation of the Access2Sea Business Model (WP6)

TASKS

The main tasks were proposed to improve and implement new seaweed cultivation techniques indoors (laboratory conditions) and outdoors (earthen ponds).

- Design and test new cultivation systems
- Testing feasibility of novel species
- Increase growth rate efficiency
- Accelerate seaweed processing (dryer prototype)

In addition to carry out a technical and business model evaluation of SME to capitalise the knowledge acquired.

Innovative technique

NOVEL SUBSTRATE (seeding strings)

- Codium tomentosum
- Codium decorticatum

Innovative species

NOVEL HIGH-VALUED SEAWEED SPECIES

(Laboratory and earthen ponds cultivation)

- Codium tomentosum
- Codium decorticatum
- Gracilariopsis longissima
- Chondracanthus teedei

Innovative system

STRAIN COLLECTION AND VEGETATIVE

CULTIVATION (earthen ponds cultivation)

- Gracilariopsis longissima
- Chondracanthus teedei
- Gracilaria gracilis

RESULTS

A technical report that gathers the identification of local SME bottlenecks, providing cultivation alternatives (tested in lab conditions and in situ), besides the outcome's evaluation was elaborated.



PARTNERS:

ÚDARÁS NA GAELTACHTA INNOVATION AND MANAGEMENT CENTRE WESTBIC

AIM

To build a bespoke smart unit that includes a cold room, a dryer for algae and an ice plant for fish. By using renewable energy and smart technology these infrastructures and facilities will maximise the quality, viability, and allow higher survival rate of shellfish during transport to markets.

TASKS:

Novel live holding system which allows for continuity of supply of product to the market and customers, will incorporate the following functions:

- Storage
- Live holding
- Real time monitoring of biometric data during storage maintaining water quality parameter
- Controlled temperature
- Dispatch
- Processing/packaging



5.3 PILOT 3: SUSTAINABLE AQUACULTURE ACTIVITIES PILOT PROJECT COLD STORAGE SOLUTION

RESULTS:

- An increase in the quality, viability, and shelf-life of the goods.
- Capitalisation of knowledge and process through the sharing of data with key partners
- Development agencies to boost transferability that can be used in other locations.
- To sustain the livelihood of the local community through allowing for further added value revenue streams
- The improvement in the process as a direct effect of the implementation of technology and innovation in the Business.
- Increase in revenue.
- A sales and marketing plan to capture new markets and maintain them.



5.4 PILOT 4: **AQUACULTURE ACTIVITIES** SOCIAL ACCEPTANCE LUMPFISH WELFARE WATCHER

PARTNER:

SWANSEA UNIVERSITY

AIM.

The aim of the pilot was developing tools to help farmers monitor the welfare of lumpfish and take remedial actions.

TASKS:

- Biometric and welfare data as recorded • from fish hatcheries and salmon farms
- An initial prototype of the scoring index • was presented in a workshop and optimized following farmers recommendations.
- Once the LOWSI was optimised we worked ٠ with fish farmers, software developers, and designers to create the tool.



RESULTS

The Lumpfish Welfare Watcher is a web-based application created through four innovative tools:

- 1. A diagnostic welfare scoring chart that can be used by fish farmers on site.
- 2. An e-training platform.
- 3. A Body mass index (BMI) calculator to detect underweight lumpfish.
- 4. A Rapid Welfare Assessment tool for lumpfish to calculate Operational Welfare Score Index (LOWSI) based on four visual indicators (skin damage, eye condition, caudal fin damage and suction disc deformities)

The Lumpfish Welfare Watcher application package includes a user manual, a lumpfish Welfare chart and an e-training course.



PARTNER: **CIIMAR**

AIM

TASKS

Three fish trials were carried out to gather experimental data to

- support the development
- validate of a numerical model •
- foresee an optimization of fish intake accordingly to fish weight, water temperature and salinity ٠



RESULTS

numerical model was designed and tested to calculate and predict maximum feed intake in marine fish under different husbandry conditions (temperature and salinity).



Develop a simulation model based on experimental data of feed intake in order to minimize the waste of unconsumed fish feed. Hence, provide information and guidance for reducing aquaculture productive costs.



MAIN RESULTS AND CONCLUSIONS

Access2sea has succeeded in providing new opportunities for the Aquaculture sector to boost sustainable blue growth in the Atlantic region by integrating three different disciplines such as social acceptance, marine spatial planning, and business model development.

Access2sea have detected that the implementation of Marine Spatial Planning (MSP) provides an opportunity to address some of the planning constraints faced by the sector. The practical cases analysed in the framework of the project and coming from different countries and scenarios, allowed us to extract relevant methodological aspects increasing the guarantees of success of aquaculture projects on the European Atlantic coast.

Access2sea have identified that licensing requirements in term of spatial planning must be simplified and accessible to encourage aquaculture entrepreneurship.

Access2sea pilot projects have demonstrated that the innovation in terms of technical designs and modelling tools supported by financial advice ensure competitivity and market diversity.

Access2sea pilot project results have provided to the aquaculture sector and the general public interested access and advice for the implementation of several tools in order to identify novel business opportunities.

Access2sea has identified that strategic engagement and cooperation between all stakeholders to participate in decisions concerning aquaculture farms is essential for effective spatial planning, as well as contributing to improve social acceptance.

7.DISSEMINATION AND COMMUNICATION

CAPITALIZATION Α.

During the implementation of the project, the partners have worked on a strategy to capitalise on the results based on the available knowledge that feeds Access2Sea from previous projects and other EU strategy projects, research papers and scientific articles.

Each partner has created Local follow up committees (LFC) to evaluate the different methodologies. procedures and actions to be implemented in each region. Periodically, they have met with their LFCs to share the results of the studies carried out and generate new opportunities.

Action for Change Action Plan

The Action Plan for Change represents a formal commitment by the association to continue the work of Access2Sea beyond the project completion date. To ensure the long-term impact of Access2Sea's results, the Association is committed to:

- Involve relevant bodies in Access2Sea outreach events.
- Disseminate the tools created within the framework of Access2Sea and make them available to local SMEs.
- Maintain the Access2Sea website. •
- Keep the map of opportunities updated with the latest opportunities in the regions.
- Disseminate the results of Access2Sea as part • of annual international maritime events.
- Work to make aquaculture SMEs visible to • international markets.
- Keeping the association alive by organizing • occasional meetings.



В COMMUNICATION MATERIALS

A wide set of communication material has been designed to facilitate the scope of project information, results and conclusions. The contents have been disseminated to different skateholders member of public to improve the attractiveness of the Atlantic area for the development of sustainable aquaculture. We have developed communication materials (leaflets, brochures, etc.) which type and languages was defined according the communication target groups. In addition, all the materials are open access and available for download as pdf from the Access2Sea project website at www.access2sea.eu



С

NETWORKING

Dissemination and communication have provided a wider scenario for networking stablishment. Numerous skateholders, academia, industry and direct SMEs among others have showed interest and have contacted the project partners for information and support in development of business models social acceptance and spatial planning of the aquaculture sector.









27



LEARN MORE ABOUT ACCESS2SEA:

WWW.ACCESS2SEA.EU

TWITTER: @ACCESS2SEA LINKEDIN: ACCESS2SEA