





AQUACULTURE PILOT PROJECTS IN THE ATLANTIC AREA REGION

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PILOT ACTION 3. SUSTAINABLE AQUACULTURE

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OVERVIEW

Aquaculture innovation has a key role to play in the success of blue growth and sustainability, contributing to competitiveness, resource efficiency, job creation, 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 project is compromised with these targets and besides is improving accessibility to the marine space, supporting SME to boost business models and elaborating innovative tools or methodologies.

Access2Sea's project count on four areas of intervention to boost aquaculture SME's: **Social Acceptance**, **Spatial Planning**, **sustainable Business Models** and, in parallel, **Pilot Projects** developed with the purpose of materialising the results obtained throughout the project execution.

Pilots projects have been developed to answer to the <u>key fields of the project</u>: (1) **Improve the social acceptance of those activities**; (2) **Support the sustainable aquaculture activities** (new and existing) **and spatial planning**; (3) **Take advantage of business opportunities detected**.

Each pilot action carried out during the project execution were previously framed in these three main objectives: <u>Pilot action 1</u>, New aquaculture sites, satisfied the necessities observed in (2). <u>Pilot action 2</u>, aquaculture activities installation, was framed as part of (3) in addition to <u>Pilot action 5</u>, Feed intake simulation model. <u>Pilot action 3</u>, sustainable aquaculture, and <u>Pilot action 4</u>, social acceptance activities, were developed in the context of (1).



PILOT ACTION 3: SUSTAINABLE AQUACULTURE

Experimental pilot project aimed at developing a smart facility for storage and processing of algae and shellfish

1. INTRODUCTION

Access2Sea <u>http://www.access2sea.eu</u> is a European project funded by Interreg. A key objective of Access2Sea is to facilitate the sustainable development of small and medium sized companies in the aquaculture sector in the Atlantic Area.

The project is administered through Údarás na Gaeltachta and WestBIC in Ireland along with international partners on the west coast of Europe, the Atlantic Area: France, Ireland, Portugal, Spain and UK.

Aquaculture, the farming of shellfish, such as mussels and oysters, seaweeds and fish such as salmon, are some of the most important sectors of the Blue Economy of the Atlantic Area. This sector is dependent on the important traditions in many EU countries and is relevant to virtually every coastal area.

A pilot scheme lasting up to a period of six months to be completed in the Gaeltacht is an important part of the implementation of this project. The aim of this pilot scheme is to support producers in the aquaculture sector to add value to their products with the help of innovation, especially those that contribute to sustainability.

Údarás na Gaeltachta and WestBIC sought expressions of interest from companies, community groups / co-operatives or groups of producers in the Gaeltacht who were interested in implementing a pilot project to add value to their seafood products. The successful application was the proposal to build a cold storage and/or processing unit—temporary and dismountable—to land and store shellfish caught in Cill Chiaráin Bay that is located in the Gaeltacht of Connemara in Co. Galway.

The current proposed model is a multi-consortium collaboration in Cill Chiaráin bay with a local cooperative of shellfish farmers, Comharchumann Sliogéisc Chonamara Teoranta (CSCT), as a sales conduit for the producers—fishermen and women—by building a mobile, dismountable processing and/or storage unit. This will allow for shellfish to be stored before being sold, allowing for planned sales and the continuity of supply. CSCT are based in the Connemara Gaeltacht, in Co. Galway on the west coast of Ireland. CSCT fish native oysters and scallops and stock levels are enhanced by sustainable aquaculture techniques and are exclusively fished under an aquaculture license.

Implementation of technology transfer in the form of a cold storage facility increases value at the end of the value chain rather than the start and this will provide a new route to market for CSC Teo by adding and increasing the value to the product. Supported by research organisations, state agencies, HEIs and international research projects, the pilot at CSC Teo can be mirrored in similar localities throughout the Atlantic region.



IMPLEMENTATION SUMMARY

This pilot project has the potential to change the future direction of this organisation through capitalisation and the utilisation of smart technologies, through increasing business opportunities, helping the sustainability and restoration of the native oyster habitat and sustaining the livelihood of the local community through allowing for further added value revenue streams.

The pilot project will allow the organisation to increase their turnover through overcoming barriers of entry to other high value low volume markets, which are currently not accessible. This project could also be rolled out in other regional and peripheral regions around the Atlantic area while contributing to the UN Sustainable Development Goals (SDGs) of *No poverty, zero hunger, good health and well-being, decent work and economic growth, industry, innovation and infrastructure, sustainable communities, responsible consumption and production, climate action, life below water, and partnership for the goals.*

Background:

Seen as a key resource in the region, the oyster beds in upper Cill Chiaráin Bay and the scallop beds in Cill Chiaráin and Beirtreach Buí Bays have been the focus of a great deal of organisational and development effort over the past five decades. While important historically and economically they are only a small part of the inshore resources that taken together form the basis of the livelihood of hundreds of local people. At present, there are 88 local harvesters who are active members of CSC Teo. The prime objective of the new development plan for the co-op is "to fully develop the potential of the licensed area" to enhance and sustain the livelihood of the local community.

CSC Teo though the sustainable utilisation of their aquaculture license and resource aim to better utilise the low trophic species resources in the licensed area (Oyster, Scallops, Macroalgae and Clams). The Native oyster is a unique and valuable low trophic resource and is a 'keystone species' in the marine ecosystems and creates a physical habitat for other fauna supporting high biodiversity. Globally, an estimated 85% of oyster beds and reef habitats have been lost (MDPI, 2019). Recognising this, the EU has afforded considerable protection to the Native Oyster and other species in coastal environments. Currently the native oyster is listed on the OSPAR List of Threatened and/or Declining Species and Habitats (Region II – Greater North Sea and Region III – Celtic Sea). Following this conservation status, Ireland set up "The Irish Native Oyster Fisheries Forum" (INOF), funded under the European Maritime and Fisheries Fund, to concentrate on native oyster populations in oyster fishing areas in Ireland. The organisation, Comharchumann Sliogéisc Chonamara Teo. (CSC Teo) is a member of INOF and are actively engaged at meetings and activities.

The CSC Teo quota mechanism, which is data led by annual independent surveys conducted by the Marine Institute on their behalf, allows the cooperative to estimate the stock they sell and allows them to make decisions for further stock enhancement activities. Experience has shown that native oyster fishery restoration is possible through aquaculture activities and implementing management plans.



<u>Methodology</u>

As an aquaculture operator CSC Teo have identified a number of opportunities for enhancing revenues. The options fall into two broad categories – production and marketing. The challenges of implementing each option vary, as do the size of the pay-off and the likelihood of success. The options related to production are challenging and are the core basis of the business. They are a high priority, and the co-op is working to continuously improve their processes to make production efficient and sustainable. The success of an efficient production process is fundamental to the success of any of the marketing options. The co-op is continuously improving their production and looking towards marketing their brand *Bia Mara* and gaining access to new markets.



The protection of the native oyster is key to the co-ops work and as such their annual quota for sales is based on a 1/3 quota mechanism, where 1/3 is used for sales, 1/3 for stock enhancement and 1/3 left to provide ecosystem services. CSC Teo vision for the pilot project is to increase the business opportunities in the blue economy, while developing their sustainability model and increasing the value of the end- product.

The management plan involves co-op members laying an unprecedented volume of seed oysters; using a varied mix of wild, innovative aquaculture and ranched methodologies that protect the brood stock against fishing and other anthropogenic disturbance. This combination of volume, variety of technique and protection will give the current local network the best chance of ensuring resilience against challenges.

2. PILOT DESIGN

This pilot action aimed to:

• provide infrastructure and equipment for the shellfish producers to store their produce giving them an option to either sell directly to wholesalers on the pier side or to store them and sell them directly to consumers thus enabling them to receive a higher value for their produce



 increase the knowledge and skills of the local shellfish cooperative on food safety handling

The project involved the development of a Pilot Enterprise & Development Centre that would give the co-op the opportunity to branch into new markets that are not accessible to them at present. For the past 40 years, CSC Teo. sell their products to licensed fish distributors. This model limits their opportunities to sell and restricts the pricing model that is available in the market.

The Pilot Enterprise & Development Centre will support the co-op's ability to sell directly to retailers, hotels, and restaurants and to gain access to these markets.

This project is an industry lead market approach and supports Access2Sea objectives to integrate a market approach strategy that supports the development of SMEs and supports social enterprises. This project meets the main objectives of Access2Sea by unlocking the existing barriers (gaining new markets), by disseminating new and existing solutions to current issues and it provides support to aquaculture SMEs, to strengthen or attract them to the area. With an established Pilot Enterprise & Development Centre CSC Teo. would be able to clean, grade and sell the traditional currach caught shellfish products directly to the consumer at a premium price.

3. PILOT IMPLEMENTATION

The pilot project aimed to fit-out a shellfish cold storage and processing unit using a novel live storage technology. Initially it was proposed to kit out a mobile unit and to locate this close to the landing site of the shellfish, however due to regulatory issues this approach was not pursued.

A review of a number of sites was undertaken as to where the pilot project could be implemented. The majority of sites required planning permission for the cold storage unit. The process to obtain planning permission is time consuming and it is difficult to get a license on a new site for such a mobile cold storage unit for the aquaculture products.

After undergoing a lengthy process on planning permission enquires with the local county councils, a suitable unit was located in South Connemara next to Breizon Fish Processing company in Ros an Mhíl.

The decision to lease a space from a local processor called Breizon Teo was taken, as there was no planning permission required and this allowed the pilot project to continue without any lengthy delays that would have been encountered with the planning application on a new site.

Breizon was founded by the Trahan Family in 1977. At the beginning they packed Prawns in the home kitchen of Guenael Trahan, one of the owners of the company. Since then, the business has been relocated and developed in Ros an Mhil. They prepare, exports Fresh, Frozen, Cooked and Live Shellfish to Europe and China. Their 40 years of experience guarantees high quality products delivered to every Customer. Breizon supports the pilot



project and have signed a contract to lease a space that allows CSC Teo to shuck the scallops, clean the oysters and package and brand the shellfish to sell in premier markets.

In conjunction with the space provided by Breizon the pilot project has begun the process to build the Pilot Enterprise & Development Centre and commission a bespoke 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 shelf-life of CSC Teo's end product to the market.



The business models

The traditional business model is harvesting to order. The live tanks have created a new business model and is considered smart technology through the real time monitoring of biometric data during storage, maintaining product quality and allow greater survival during transport to new and emerging novel markets. Keeping oysters in live holding tanks rather than in the water where they are grown helps reduce double-handling, ensures quality, and opens potential new markets.

To deliver seafood directly to the market, the Pilot Enterprise & Development Centre required authorisation permit from the Sea Fisheries Protection Authority and Bord Iascaigh Mhara, Ireland's Seafood Development Agency.

The cold storage room is now built. The unit is split into two parts – a dry cold storeroom located in the Breizon factory and a live storage centre on Cill Chiaráin harbor. Both centers have now been approved by the Sea Fisheries Safety Authority. Live shellfish shall be allowed to be kept in two baths: the live monitoring system, funded by Access2Sea and the water-cleaning and monitoring system, provided by Bord Iascaigh Mhara.

The following equipment has been purchased for the unit:

KATSBRD1200 Atlas Single Bowl Sink SBRD1200 Vogue Stainless Steel Midi Pot Wash Sink with Undershelf KATWB1200 Atlas WB1200 Wall BENCH w/undershelf KATEBF05 Atosa EBF-05 Blast Chiller 5 Pan NEVNACS15 Scales Digital 15 kg Limit BTA300151 Digital Scale 150 kg, 50 g GAS7950.5020 EcoFrost Freezer 2 Door Boss MAX 42 Vacuum Packing Machine Wheelie bin, Ecostore Wheelie bin 1,100L Mobile printer Labelling, Zebra m.s. TMC monitoring system



Water Boiler Cold room 80 mm Optima Walk-In Freezer 3200 x 1600 x 2 000 mm



The centre was granted its first conditional approval in December 2022, which is valid for a period of three months from the date of issue. This allows the cooperative to sell directly to the market through the Center. The centre will be inspected in 3 months and upon a successful audit a longer period for the permit will be issued.

	Comharchumann Sliogéisc Chonamara Teo T/A Bia Mara IEGY*** EC Live Scallops (Pecten maximus) in the shell Caught by dredges, ICES 7B, West Coast of Ireland, Conamara Store chilled between 4 °C and 10 °C Date of Harvest 17 December 2022 Muct be alive before shurking	
1111170	Allergens – Molluscs (Shellfish) Batch number 002 (10 dozen) Comharchumann Sliogéisc Chonamara Teo, T/A Bia Mara, Ruisin na Mainiach, Carna, Co. na Gaillimhe H91 Y295	
	TE GY XXXX EC	

A Food Safety Management System is in operation in the centre and contains sufficient measures applicable to the species handled to ensure the placing of safe food on the market.

Novel Live Holding Technology

Smart live holding system which allows for continuity of supply of product to the market and customers, where real time monitoring and maintaining water quality parameter and



controlled temperature will boost the product quality and enhance product safety and



security.

The co-operative also reached an agreement with the Galway and Roscommon Education and Training Board to provide a seafood safety course for members of the co-operative. The HACCP course was completed in October 2022.

4. PILOT ASSESSMENT

Knowledge and technology transfer from ongoing EU research and innovation projects which CSC Teo are linked with (AquaVitae H2020 and InEVal H2020 BlueBio ERA Net Co-fund). Both of these projects cover the very beginning of the value chain at shellfish production and harvesting of the resource, where the innovation is in the Access2Sea proposal is firstly the streamlining and closure of the value chain and secondly the certation of a smart live-holding facility along with an approved shellfish dispatch centre.

https://astfilters.com/aquatic-systems/applications/live-bait-seafood-holding-systems/

Through working with scientific partners drawn from the regional HEIs and marine research and development agencies, CSC Teo is working collaboratively in sharing data and knowledge with key partners in research institutes and agencies such as GMIT, Marine Institute and the SFPA.



5. PILOT TRANSFERABILITY

Wild shellfish are fished rather than farmed. Stock levels are enhanced by sustainable aquaculture techniques and exclusively fished under an aquaculture license. Secure storage enables supply continuity and market access and thereby added and increased value. The innovation/technology transfer is increasing value at the end of the value chain by adding and increasing value to the product. In other words, ensuring continuity and regularity of supply by enabling fishers to sell their product at the optimum market price. The project dovetails with other ongoing research, monitoring and stock management through national institutions and European projects. The pilot has developed additional partnerships with Breizon and BIM and with Atlantic Technology University and the EU project *Aquavitae* and with the assistance of the relevant authorities is close to achieving a working model. CSCT has identified local markets for sales and believes that 60 % can be added to the prices achieved heretofore.





6. RESULT DESCRIPTION

This pilot had the objective of adding value to seafood produce by creating cold storage and processing facilities for the producers where the produce could be stored for a period by producers and sold at an optimum market value directly to consumers. Secure storage enables supply continuity and market access and thereby added and increased value.

The Access2Sea pilot project when viewed in the context of the other projects represents a final jigsaw piece in allowing the successful restocking and selling of shellfish. By enabling direct sales, this allows producers to invert the value pyramid—the cooperative is increasing value by targeting low-volume high-value markets as an alternative to selling below market value.

The challenges faced by CSCT has highlighted the lengthy period, expense and expertise required to obtain the necessary permits from state authorities to undertake the storing and processing of seafood in Ireland. It also highlighted the need for fishermen to undertake basic food safety courses if handling seafood and processing seafood beyond the landing point.

This model pilot can be replicated not only across the region but nationally and across the Atlantic Area. In direct reference to Portugal a model pilot, their fish are of a comparable high quality to imported fish for prosaic reason. The fish is line caught and therefore their scales are not damaged as is the case where mass-fishing techniques are employed by high volume competitors in Greece and Turkey. This similarly allows the value pyramid to be inverted; as is the case in Ireland, Portugese fishing and aquaculture produce is highly sought after.

Indicators

Key indicators are as follows:

- An increase in sales and margins for the co-op.
- An increase in the quality, viability, and shelf-life of the goods.
- Capitalisation of knowledge and process through the sharing of data and knowledge with key partners in research and development agencies that can be used in other locations and sites.
- Increase in direct employment linked to the Pilot Enterprise & Development Centre.
- The improvement in the process as a direct effect of the implementation of technology and innovation in the Business.
- A training programme to build the knowledge and skills of the employees and members of the co-op.
- Increase in revenue directly linked to the Pilot Enterprise & Development Centre.
- A sales and marketing plan to capture new markets and maintain them.



Local scallops from CSC Teo member are now being sold directly to local retail shops and restaurants at a premium price. CSC Teo reported a +60% mark-up on the price obtained from the local retail shop at \in 2.50 for one scallop or 12 scallops for \in 25. Image below of CSC Teo scallops on display in the local retail store:



7. INDICATORS

- Number of enterprises supported to introduce new to the firm products:1
- Number of case studies and pilot actions implemented:1

7.1 SME's involved

Comharchumann Sliogéisc Chonamara Teo. is a fishing cooperative in Cill Chiaráin, County Galway, Ireland operating since 1984. In 1987, the co-op was assigned an aquaculture license (Ref No. AQ656) for Oyster, scallops, and clams from Cill Chiaráin to Beirtreach Buí. CSC Teo. work on a collaborative basis with the Marine Institute, in the surveying of stocks and restoration, with the SFPA carrying out weekly water and fish sampling, with Údarás na Gaeltachta for business development assistance and with research organisations such as GMIT for stock monitoring and best practice development. CSC Teo. is also a member of the CLAM, Coordinated Local Aquaculture Management Group for Cill Chiaráin Bay. CSC Teo.'s fish are only sold to fish distributors such as Gannett, Galway Bay Seafood, SSI and Mary's Fish.



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 Cuideachta Feamainn Turtar Gorm Teo (TSC - Bleu Turtle) www.theseaweedcompany.com

> Association of Aquaculture Marine Businesses of Andalusia (ASEMA) www.asemaonline.com

 Union Chamber of Algae and Marine Vegetables (CSAVM) www.chambre-syndicale-algues.org



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