Interreg Atlantic Area
European Regional Development Fund

EUROPEAN UNION

access 2 sea

WP7. Pilot projects

Action 2: Aquaculture activities installation

Project identification:

EAPA_1059/2018 – ACCESS2SEA

INITIAL TENCHNICAL & FINANCIAL ASSESSMENT OF SME

CEEI Bahía de Cádiz
Centro Europeo de Empresas e Innovación

WestBIC

ciimar
Centro Interdisciplinar de Investigação Marinha e Ambiental

Technopole Quimper-Cornouaille

INVESTIR EN FINISTÈRE

ctaqua CENTRO TECNOLÓGICO DE LA ACUICULTURA

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Introduction

Aquaculture innovation has an essential 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. One option that has great potential for the transition to the circular economy is multi-trophic aquaculture. Although it is a promising area of aquaculture, it presents some different risks and challenges depending on the country or region. The ACCESS2SEA project supports this transition by assessing both the technical and business model of a company in the sector, namely the company Tsiane acuicultura multitrofica S.L.U. located in the Parque Natural Bahía de Cádiz.

The purpose of this evaluation is to gather information on Tsiane's production cycle, species marketed, fishing and farming techniques and production management. In addition, an evaluation of the company's business model carried out by the European Business and Innovation Centre (CEEI) Bahía de Cádiz. In this way, the company will be able to transmit its short-term objectives and contribute to the best advice and preliminary search for farming alternatives that could be implemented in the company to increase its profits and make the most of the available space.

Thanks to this evaluation, it will detect opportunities for improvement in the efficiency of technical and operational aspects of cultivation that will be implemented in the design and execution of the pilot actions that will be carried out in the framework of the Access2Sea project.

TECHNICAL EVALUATION

1. Multi-trophic Aquaculture : definition and considerations

One of the strategies that companies can adopt to improve the profitability of production without affecting or even improving the balance of the ecosystem is integrated multi-trophic cultivation (IMTA), which was defined during the INTEGRATE project (Interreg Atlantic Area).

> *Integrated Multi-Trophic Aquaculture (IMTA) is considered as an enhanced production of aquatic organisms (with or without terrestrial organisms) from two or more functional groups, which exhibit a trophism relationship through demonstrable nutrient fluxes, and whose biomass is wholly or partially removed by harvesting to facilitate ecological balance.*

From the analysis of the IMTA systems carried out in the INTEGRATE project, the conclusion was drawn that these systems offer a positive increase in profits for the companies that implement them. However, this can vary widely depending on the species included. Therefore, an important characteristic when choosing the species that will make up the IMTA is their commercial value, without forgetting their productivity and suitability for the rest of the species produced in the company in question.

Thanks to this project, based on the existing bibliography, the main groups of species per country that can make up an IMTA system were identified (Fig. 1). This was carried out for the five countries involved in the project, Portugal, United Kingdom, Ireland,

France and Spain, where algae are listed as the main group for the establishment of multi-trophic crops in Spain (Fig. 1). All this compiled information is available in a project output document.

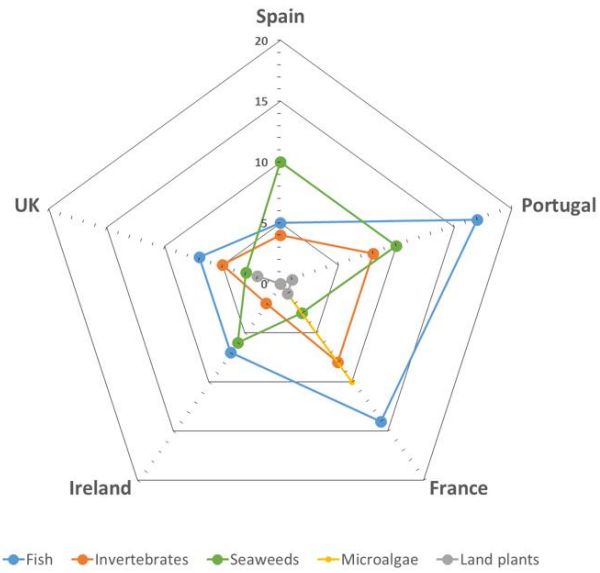


Fig. 1. *Distribution of IMTA references per type of organism, per country.*

The establishment of this type of aquaculture enables companies to diversify their production, allowing them to increase their profitability in a sustainable way by incorporating other species with commercial value that contribute to the ecological balance in the salt marshes.

2. Aquaculture production in the Bay of Cadiz Natural Park

The Atlantic coast of Cadiz is dominated by important estuaries and sandy shores. These environments are very rich in nutrients and therefore very productive, but with highly variable environmental conditions, including temperature and salinity.

The Parque Natural Bahía de Cádiz (PNBC) is a large expanse of wetlands associated with the mouth of the Guadalete River in the south of the province of Cádiz, which were transformed in Roman times for salt extraction. As a complementary activity to salt extraction, '*despesques*' were carried out, i.e. fish which had been 'accidentally'

trapped in the water circuit of the salt pans were extracted. Thus, over the years, extensive aquaculture became an economic activity in its own right, leading to a more intensive transformation of the wetlands. This transition resulted in an extensive network of salt pans, canals and water ponds (Fig. 2), constituting a unique enclave of great ecological, cultural and economic value.

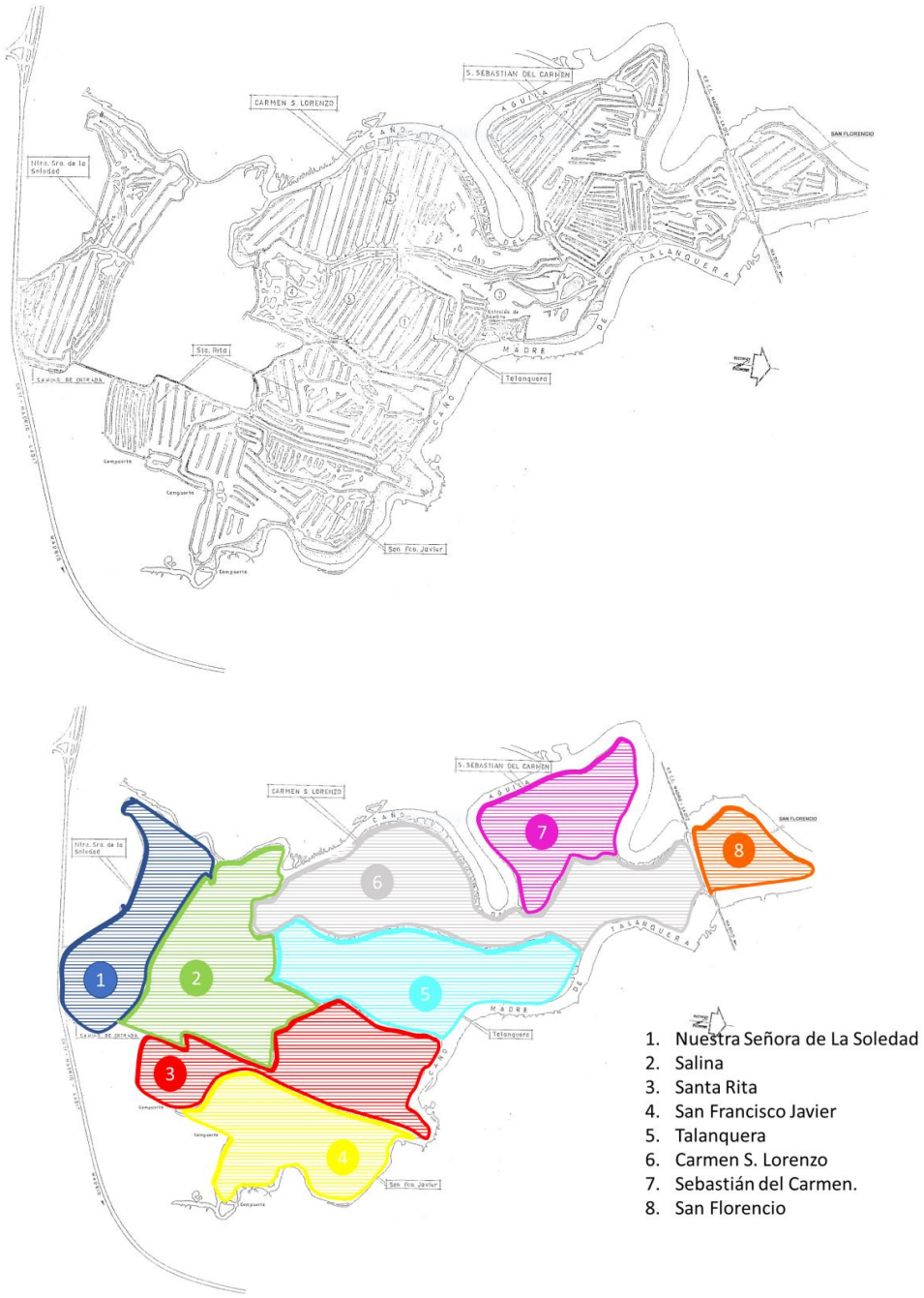


Fig. 2. Map of Grupo Talanquera.

3. The company, Tsiane Multitrófica Aquaculture

Tsiane Acuicultura Multitrófica, hereinafter Tsiane, is a company located in the Bahía de Cádiz Natural Park. It is dedicated to extensive aquaculture production in estuaries, specifically in the Talanquera Group, a group of salt marshes with a total surface area of 679 hectares covering the municipalities of El Puerto de Santa María, Puerto Real and Chiclana de la Frontera (Cádiz).

This business is based on the foundations of a Blue Economy, reducing environmental degradation to the minimum possible, using the available resources in cascade production systems, where the waste from one product becomes raw material for the next link in the food chain. This economy recognizes the importance of the seas and oceans as engines of development, so it promotes their protection by using their resources in a sustainable, profitable, integrated way, thus contributing to the food security of the population.

Currently, the services offered by Tsiane are mostly based on extensive production of indigenous marine species as their main source of income. Although they are actively involved in:

- The study, planning and development of projects based on the blue economy.
- Supplying goods and services to the aquaculture and associated tourism activity.
- Development of brands and products for added value.
- Planning in the marketing of fisheries, aquaculture and ecotourism products.
- Resource assessment.
- Environmental impact assessment.
- Waste management.
- Expert reports.
- Advice and procedures for financing and subsidies.

3.1 Extensive production of native marine species.

The production carried out by the company Tsiane is completely extensive, that is, none of the cultivation parameters are affected, following the natural cycles of the tides and taking advantage of the species distributed in the area. This unique aquaculture production consists of an annual cycle where only species are cultivated from February to September. The rest of the year is used exclusively for cleaning the systems.

In winter, from December to February, after the emptying of the ponds, the sluice gates of the salt ponds are open, so that the water enters and leaves, due to tidal drift, turning the salt ponds into an open circuit connected to the sea. This period is used for cleaning the bottom, as in the months when the sluice gates are closed to keep the animals growing, organic matter from the animals' excretion products accumulates on the bottom.

During the spring, from February to May, the sluice gates are kept open, although the estuaries are not empty, as what is known as a "breeding table" is placed in each one of the sluice gates. This methodology is carried out so that the water level inside the culture vessel is maintained at a certain depth. In this way, the juvenile fish that have entered during the previous tide cycles are kept inside the culture space.

The month of May is the time when the floodgates are closed, usually after the highest tide of the month, ensuring that the volume of water kept inside the culture vessel is at its maximum. At this point, the growth phase of the entire annual production of the company begins. As previously mentioned, it is an extensive production, so no exogenous feed is added to the culture areas, the fish and crustaceans are fed naturally.

During this period from May to September, water renewals are carried out, opening the floodgates at night and closing them in the morning, in order to maintain the quality of the water so as to guarantee the survival of the animals and optimum growth. These renewals coincide with the days of the full moon and the new moon. The ponds will remain like this, with periodic opening and closing of the sluice gates,

until the autumn months (September-October). It is then that the biomass produced is extracted. After harvesting, usually in October, the ponds are emptied and cleaned to prepare them for the next production cycle, which will begin in February.

3.2 Commercialized species

The Commercialized species by the Tsiane company are those that occur naturally in the salt marshes of the Bay of Cadiz. Below is a table with the most representative species and the annual quantity harvested by the company:

Table 1. Common name, scientific name and annual production volume of the species marketed by the Tsiane company in 2020.

Common name		Scientific name	Annual production (kg)
Prawn		*Penaeus kerathurus*	300
Sole		*Solea sp.*	350
Sea bass		*Dicentrarchus labrax*	200
Blackspot Sea bream		*Sparus aurata*	600
Mullet		*Liza ramada*	2500
Sand smelt		*Atherina boyeri*	100

3.3 Fishing gear

Harvesting is carried out in the months of September and October, using different fishing gear depending on the target species. In the company Tsiane you can find two different fishing gears in its facilities.

Fishing for sea bass, sea bream, mullet, sole and sand smelt: To do this, the fishermen use flakes set in the bottom of the vessel which they drag from one end of the vessel to the other in order to collect the fish and remove them from the water (Fig. 3).

Fig. 3. Fish catching in the Bay of Cadiz salt marshes.

Fishing for Prawn: as prawns are detritivorous in nature, they remain buried in the sediment for most of the year, and it is from July onwards that they begin to dig themselves up. It is at this time that the creel with which they are caught are placed. The fish traps (Fig. 4) are fishing gear consisting of a blind codend. This instrument is set in the bottom in the evening to increase the chances of catching them, as they are nocturnal crustaceans with greater activity between 19:00 pm and 2:00 am. The extraction of the fish trap is done the following day.

Fig. 1. Fish trap for prawns

3.4 Production management

Harvesting is also cyclical throughout the year, depending on the commercial species harvested. Most of Tsiane's production is divided into fish, shrimps and prawns. Ichthyofauna, mainly sea bream and sea bass, are caught annually between October and November. The prawns (*Penaeus kerathurus*) are caught between the end of July and November. Although they are not the main source of income, shrimps (*Palaemon spp*.) and several species of crabs (Table 1) also represent a relevant part of the production, being caught periodically throughout the year and in summer, respectively.

All resources obtained from the Tsiane estuarine area are distributed after harvesting as there are no storage facilities. Therefore, they have a portfolio of customers to whom they inform about the state of production or frequent the facilities. The sale of their products can be either direct sales to the final consumer or in HORECA sector. At present, they do not harvest on demand, the clients adjust to this seasonal nature of the products. Before being put on sale, the products offered by this company do not include any type of transformation, they are only marketed fresh.

4. New challenges: Species diversification

4.1 Fish and invertebrates

The company is in the process of extending its cultivation authorization in order to include species that have been observed to occur naturally in its facilities, thus diversifying production, but always maintaining the extensive nature of cultivation. Below is a table with the species to be included in the new cultivation authorization.

Tabla 1. Lista de especies que se incluirán en la ampliación de la autorización de cultivo.

Group	Common name	Scientific name
Fish	Spotted sea bass	*Dicentrarchus punctatus*
	Sea bream	*Diplodus sargo*
	Meagre	*Argyrosomus regius*
	Mummichog	*Fundulus heteroclitus*
Crustacean	Blue crab	*Callinectes sapidus*
	Green crab	*Carcinus maenas*
	Fiddler crab	*Uca tangeri*
	African mud crab	*Panopeaus africanus*
	Mysidaceans	*Several species**
	Amphipods	*Several species***
	Artemia	*Artemia spp*
Mollusk	Cuttlefish	*Sepia officinalis*
	Peppery furrow	*Scrobicularia plana*
	Common edible cockle	*Cerastoderma edule*
Polychaeta	ragworm	*Nereis diversicolor*
	common bait worm	*Marphysa sanguínea*
Zooplankton	Ciliate	*Fabrea salina*
	Rotifers	*Synchaeta spp*

*: *Siriella clausii, Mesopodapsis slabberi, Diamysis bahirensis, Schistomis kervellei.*

**:*Gamarus insensibilis, Melita palmata, Monocorophium acherisicum, Michrodentopus grillotalpa.*

On the other hand, as part of the ACCESS2SEA project, an experimental cultivation authorization will be requested for some of the macroalgae species listed below. In this way, the aim is to complete the range of possibilities offered by extensive cultivation in estuaries and to offer the company a commercial alternative with which it can have a continuous turnover throughout the year.

4.2. Valorization of macroalgae for cultivation purposes

Macroalgae possess a photosynthetic capacity capable of transforming solar energy into biomass with high efficiency, through a sufficient source of nutrients and light (Shelef and Soeder, 1980; Thomas et al, 1984¸Walker, 1948). Their productivity is defined by environmental conditions and the species selected for cultivation.

These organisms, in addition to their great ecological interest as primary producers on the planet, are also an economic resource offering a wide variety of applications. They represent a source of natural wealth for the entire processing industry to obtain pharmacological, dietary and food products (APROMAR, 2021).

The use of macroalgae has expanded globally due to the possibilities in the development of pharmaceuticals, pigments, dyes, bioactive components, cosmetics, fertilizers, antiviral agents or hydrocolloids (Pereira et al., 2004; Indy et al., 2014). Some examples of specific uses include culture in integrated multi-trophic systems with fish and mollusks (Neori et al., 1996), biomitigation to remove nutrients from effluents from aquaculture (Hernández et al., 2005) or bioadsorption of toxic heavy metals in wastewater (Davis et al., 2003) and, of course, for food purposes.

The nutritional value of macroalgae is largely explained by their composition in soluble fibre, proteins, mineral salts and trace elements, all of which are beneficial to human health, and also by their content in vitamins and antioxidant substances such as vitamin C, E, carotenes and polyphenols. They are low in calories, composed mainly of essential polyunsaturated fatty acids of the omega 3 and omega 6 series. The sum of these aspects has boosted their harvesting, commercialisation and, since 2016, also their cultivation on the South Atlantic coast (AGAPA, 2021).

Macroalgae cultivation can be integrated in a mono- or multi-species manner, and be based on the use of natural populations. In the Bay of Cadiz Natural Park, the most abundant species are green algae of the genus Ulva, both laminar and tubular, and red algae of the genera Gracilaria and Gracilariopsis (AGAPA, 2021).

The company Tsiane has shown interest in the introduction of macroalgae in its facilities, establishing a series of criteria for the choice of species to be included in production, such as:

- Possibility of obtaining high biomass, which implies high rates of cell division and ease of reaching and maintaining high culture densities.
- Absence of emission of toxic metabolites in the cultivation area.
- Easy to obtain at low cost, without the need for considerable investment.
- Resistance to fluctuating environmental variations during growth.
- Species for human consumption, with sufficient nutritional and gastronomic value to constitute a source of income.

Based on these requirements, CTAQUA has proposed several species considering the natural populations of greatest commercial interest in the study area and the previous knowledge obtained after the implementation of the INTEGRATE and AQUA&AMBI projects. Specifically, four species of green algae were selected: *Ulva ohnoi, Ulva rigida, Codium tomentosum, Codium decorticatum*; and three species of red algae: *Gracilaria gracilis, Gracilariopsis longissima and Chondracanthus teedei.*

Green algae (chlorophytes)

The production of green algae worldwide is comprised of 5 species, including the genera Ulva and Codium (FAO, 2021).

Ulva or "sea lettuce"

The Ulva genus grows throughout the year, although the greatest abundances are observed during the

Phyllum	Chlorophyta
Class	Ulvophyceae
Order	Ulvales
Family	Ulvaceae
Genus	Ulva sp.

summer, when environmental factors of high light intensity and temperature are involved in the formation of the so-called "green tides" or blooms. One of the most common habitats for Ulva are harbour areas and estuaries.

Uses and properties

Ulva contains significant amounts of sulphated polysaccharides, called ulvan. Ulvan is a polysaccharide whose average composition is: glucose (2.5%), galactose (2.8%), xylose (8.3%), rhamnose (51.1%) glucuronic acid (20.0%) and ioduronic acid (15.5%). The exact composition depends on both the type of seaweed and the period of its collection. Ulvan has been found to have several applications, including agriculture, pharmacology, medicine, biofuel production and food.

Nutritionally it is rich in iron, calcium, sodium, potassium, magnesium, iodine, aluminium and manganese. It also contains vitamin A, B1, C, soluble nitrogen, phosphorus and numerous trace elements. The genus Ulva is increasingly being studied for its potential uses as animal feed and bioenergy, but much of its current value may be in the field of medicine. It has been shown to have potent antibacterial, antifungal, anti-inflammatory, antiviral, antiprotozoal and cytotoxic properties. Its price for the food industry in fresh and unprocessed form is around 6 euros 200 grams.

Scientific name	
Ulva rigida	
Ulva onhoi	

Codium

Phyllum	Chlorophyta
Class	Ulvophyceae
Order	Bryopsidales
Family	Codiaceae
Genus	Codium.

This genus is found in marine habitats ranging from rocky shores exposed to hydrodynamics to calm lagoons.

In the Iberian Peninsula there are several species of Codium, the most common of which is *C. tomentosum*. This elastic and velvety seaweed is usually abundant during the summer months, with higher temperature and photoperiod conditions, in the lower parts of the coastline of locations moderately exposed to wave action (APROMAR, 2021).

Uses and properties

Codium is among the most popular edible macroalgae and is presented as a delicacy in gourmet cuisine (Radulovich et al. 2015; Pérez-Lloréns et al. 2018). It is widely used in gastronomy for its intense marine flavour, which, especially when fresh, is reminiscent of barnacles. It has a juicy texture and an intense dark green colour, which makes it attractive for almost any culinary preparation. Harvesting is carried out by hand directly from the sea, from April to mid-November, and it is only marketed fresh during these dates.

This seaweed is an important source of minerals, containing iodine, iron, magnesium, calcium, phosphorus, sodium, potassium, copper and zinc. It is also low in carbohydrates and has a protein, fibre and antioxidant content similar to that of some cereals and seeds. In addition, it has a high concentration of saturated fatty acids, with oleic acid predominating.

Codium species are known to be an important source of sulphated polysaccharides (Wang et al., 2014) and other compounds with multiple bioactive properties, such as antiviral, anticoagulant, anti-angiogenic and antitumour antioxidants (Ohta et al., 2009; Ganesan et al., 2010, 2011; Rey et al., 2020). Its price for the food industry in fresh and unprocessed form is around 7 euros 200 grams.

Scientific name	
Codium tomentosum	
Codium decorticatum	

<u>Red algae</u> (Rhodophytes)

Rhodophytes or red algae are photosynthetic organisms and contain chlorophyll a and d, as well as red pigments such as phycobilins and phycoerythrins. Some red algae are used as food and used to produce agar, carrageenans and other food additives.

Gracilariaceae

Gracilaria are red algae of the family Gracilariaceae which are used for agar extraction. The largest species can reach up to 60 cm in length.

Phyllum	Rhodophyta
Class	Florideophyceae
Order	Gracilariales
Family	Gracilariaceae
Genus	Gracilaria/ Gracilariopsis

Depending on the species, the morphology of the algae varies and they may have cylindrical or flattened stems. Their ecosystem ranges from intertidal to very deep areas, although they are more abundant in deep areas.

Depending on cultivation factors, its colour can vary from intense red to pale green.

<u>Uses and properties</u>

Gracilaria is consumed fresh as human food in salads or cooked, but mostly used for agar production (McHugh, 2003; FAO, 2018). Like alginate extracted from brown algae, agar is widely used in the food and non-food industries.

Agar is a natural hydrocolloid extracted from several species of red algae, mainly the Gelidium, Pterocladia and Gracilaria types. The marked increase in the application in the use of agar within the food industry (e.g. canning, confectionery, cakes, ice cream, etc.) is widely spread due to its properties as a dispersing, stabilising, thickening and gelling agent. It is used as a replacement for pectin and as a vegetable gelatine of marine origin, it is the perfect substitute for animal gelatine, with ten times more gelling power. Other applications can be in the use of techniques for micropropagation of plants. Its price for the food industry in fresh and unprocessed form is around 7 euros 200 grams. The gracilaria species selected for the study because of their distribution in the area are:

Scientific name	
Gracilariopsis longissima	
Gracilaria gracilis	

Chondracanthus

A family of rhodophyceae of the order Gigartinales, comprising fairly large, mostly perennial, flattened and branched thallus algae. The latter includes Chondracanthus teedei. The thallus of *C. teedei* can be up to 30 cm long. It has a cartilaginous texture, ranging in colour from dark red to yellow or green depending on its physiological state and its exposure to solar radiation. In the Bay of Cádiz, it is mainly found in areas of high hydrodynamics, such as estuary gates or water outlets, at depths of less than 3 m.

Uses and properties

This species is of great interest in the phycocolloid industry as a raw material for obtaining carrageenans. In addition, *C. teedei* has been used in Sicily for the preparation of traditional dishes, as well as in Asia, where it is marketed under the name of shinkin-nori together with other morphologically very similar species such as *C. chamisoii*

Scientific name	
Chondracanthus teedei	

The introduction of macroalgae culture should be carried out taking into account the conditions of the estuaries, such as water flow depending on the production phase, coinciding with the environmental factors that produce the most optimal and efficient growth of the species.

4. Conclusions

The production cycle of the business currently accommodates various farming activities that can be compatible with this type of extensive aquaculture to increase the use of the area's resources. Thus, providing continuity to the production cycle throughout the year. In addition to opting for the diversification of the species listed in Table 2, the introduction of macroalgae cultivation is being considered in order to test its viability and productivity in the estuary area. To materialize this project, it is necessary to monitor how the seasonal cycle of opening and closing of the floodgates affects the environment with its added variations in temperature, salinity and hydrodynamism. This management must be carried out considering each species of macroalgae, as they may have different requirements. Furthermore, considering the impact of these factors on growth, it will be necessary to develop cultivation methods and facilities through experimental trials.

To satisfy a market beyond seaweed as a fresh product that requires rapid distribution and consumption, the need has been identified to process the macroalgae to enable it to be distributed dried.

BUSINESS MODEL EVALUATION

Initial diagnostic report

COMPANY NAME: TSIANE

CHARACTER OF THE COMPANY AND SECTOR: Aquaculture Sector.

CONSULTANT PARTNERS: CEEI Bahía de Cádiz and CTAQUA.

COMPANY LOGO:

PLACE AND DATE OF REALIZATION: El Puerto De Santa María, 24th June 2022.

1. Preliminary

1.1. General Information about the Company

Company Name	Tsiane, S.L.
CIF/NIF	B72307390
Place of Business	C/ Hércules, 12. 11003, Cádiz
Telephone	649 03 73 49
Website	http://tsiane.es/
Legal Representatives	Laura Hidalgo
Contact Person	Laura Hidalgo

1.2. Organization and Direction

Constitution Date	03/2016
Legal System	Limited Society
Partners	Sole Administrator:Laura Hidalgo
Managerial Style	Results oriented
Family Character	No
Business Segurity	Si
Continuity guarantee before third parties	Si
Degree Efficiency in decision making	On time: High In cost: Low/Medium

1.3. Actions Done

For the collection of information and subsequent preparation of this report, the consultant and the company have held the following face-to-face meetings, in addition to occasional telephone conversations and exchange of e-mails:

• The visits made to the company in order to gather the necessary information for the elaboration of the preliminary diagnosis through a visit to the facilities and a personal interview with the contact person, have been carried out on the following dates:

- 03/17/2021 (3 hours)
- 04/05/2021 (3.5 hours)
- 11/05/2022 (2 hours)

2

CONCEPTUAL MAP

DESCRIPTION BY FUNCTIONAL AREAS

2.1 Products and Services

Products and Services

Driver	Rate	
P&S Definition	Typology of Products	Business line 1: Sale of fish and crustaceans, such as mullet, sea bream, sea bass, sole, prawns, shrimp and crabs. Business line 2: Ecotourism
	Product Catalog	Tsiane does not have a defined range of products, since their sale varies depending on the species that enter the estuary.
	Product Range	- Fishes - Crustaceans - Ecotourism activities
	Technological Component	All production processes are executed with the highest quality levels. Due to its activity, it does not require advanced technology. The methods they use are very traditional.
ID		

Identification	**Seasonality**	The business is conditioned by seasonality and depending on the species that enter the estuary.
	Brand Awareness	Registered in March 2017.
	Differential characteristics	Natural aquaculture and without feed contribution. Tsiane is a pioneer in the concept of the aquaculture/ecotourism package. The offer offered in the ecotourism line of business is unique, since they offer a wide range of activities for customers to learn about their products while carrying out activities related to tourism, such as enjoying a 15th century mill and cultural visits to the area showing the vegetation, flora and fauna of the area.
	Importance of packaging	As producers in the primary sector, they only use cork boxes to keep the product fresh during its transport to the customer. Soon, they will start using the same material, but with the "natural estuary fish" logo.
	Quality/Price ratio	Quality-price is reasonable.
	Channels and Typology	Tsiane market is provincial. The image of the market and the competition are factors that must be taken into account to determine its positioning and Tsiane's management is aware that it does not have a defined corporate image. It has a web page for the presentation of ecotourism services and they are adapting the web for the introduction and online sale of estuary products.

Sales by Product	Data year 2020: In the last closed financial year, sales in kilograms have been obtained from business line 1 of: • Shrimp: 300 kg • Seabass: 200 kg • Sole: 350 kg • Gilthead: 580 kg • Smooth: 2500 kg • Silverside: 100 kg • Shrimp: 20 kg Billing (I-G): 30,595,09 €

Product Margin	Data year 2020: - Line of business 1: 15% approx. - Line of business 2: the company does not have data.

2.1. Market and Innovation

Market and Innovation

2.1.1. Business Processes

Client identification	**Final customer and purchase decision maker**	Tsiane works, mainly for three lines of clients: • Private Clients (sale on the wall) • Fishmongers • Restaurants > Online sales (coming soon)
Competition	**Purchasing criteria and habits**	The purchasing criteria are already established and the market is very seasonal.
	Geographic scope	Autonomous area, although very focused on the province of Cádiz.
	Business Model	Business model based on traditional techniques.
	Market concentration/diversification	Centered in Andalusia, mainly in the province of Cádiz.

	Knowledge level	Laura has a degree in Marine Sciences and, in addition, has a Master's degree in Aquafishing.
	Competition type	Companies that have a longer history, with greater productive capacity, with established sales. Mainly, the economic and production capacity is what distinguishes it from the rest.
	Strategy	Innovation and quality. - Selection and introduction of new products that provide income throughout the year. - Innovation in other species that have good commercial value. - Diversification.
	Level and Areas of Innovation	The machinery used is traditional, since the techniques used are very simple and do not require automation.

2.1.2. Management and Digitization

Driver	**Rate**	
Operational Management and Automation	**Systematization of processes/files**	Tsiane does not have a Quality Management System in place in accordance with the UNE EN ISO 9001:2015 standard. At this time, all the "Control of documented information" procedures are being documented, in which it is documented how the information is kept up-to-date, conserved and controlled.

	Documentation treatment	Documentation is controlled on a local server and is password protected. To safeguard the documentation, backup copies are made periodically and are extracted outside the facilities.
	Automation degree and ERP resources, CMR…	N/A
	Treatment of internal and external information	The treatment of all Tsiane information, both internal and external, complies with the new General Data Protection Regulation.
	Customer service process	With the start of the implementation of the documented procedure, Tsiane is preparing a procedure on how to serve the customer, how to manage and deal with customer complaints, etc.

Indicators

Horizontal and vertical communication procedures	Tsiane is in the process of establishing a documented "Communications" procedure where internal and external communications are managed and secured.
Conflict resolution	At Tsiane, communications are managed and coordinated by the Manager, Laura Hidalgo, who is the one who makes the appropriate decisions.
Quality of the information	Communication between the organization's staff is very linear and direct.
Automated and non-automated processes	In Tsiane, the processes are not automated, since the techniques used are rudimentary, such as: water inlet systems, water renewal, capture of fish and crustaceans (the fish are captured with nets in the form of codends), prawns and Shrimp are caught with traps.

2.1.3. Production

Production

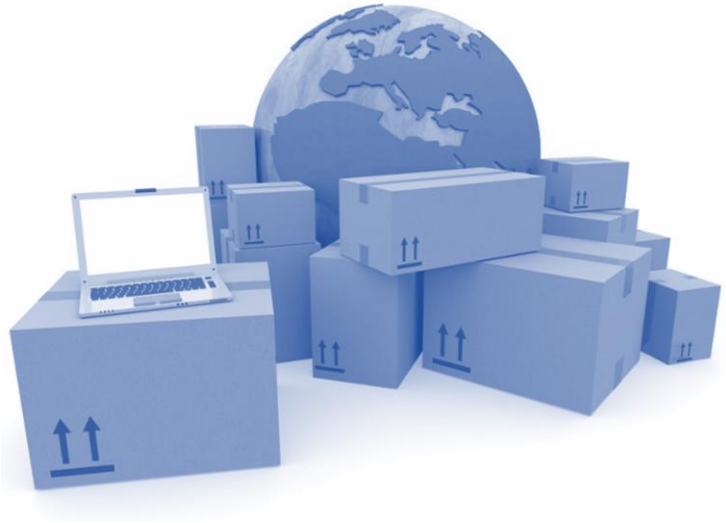
Driver	Rate	
Production Capacity	Production Capacity: Real, surplus and total and effect of seasonality	Maximum levels of production line of business 1 in 2020: • Shrimp: 2000 kg/year • Seabass: 2000 kg/year • Flounder: 4000 kg/year • Gilthead: 6000 kg/year • Smooth: 10000kg/year • Silverside: 600kg/year • Shrimp: 2000 kg/year Maximum levels of supply of business online services 2 in 2020: The company does not have data.
	Internal/external production and shifts if any	Internal production. Shifts: seasonality of production. • Maintenance (Jan-May): • Since May they do nights (3-4 nights twice a month).
	Age of machinery and facilities	Year 1989 – Facilities. Machinery: generators, woodworking tools (purchased in 2020). All machines comply with RD 1215/1997, which establishes the minimum health and safety provisions for the use of equipment by workers.
	Type of production and optimal production batch	Continuous production from May to October. • July: shrimp. • October: take off. • Jan-May: maintenance
	Productive resources, versatility and need for new resources	Very versatile areas with a wide variety of species.

Driver	Rate	
Means of production	Costs of production	The company does not have a control of the cost of production, so it is not possible to recover this data.

Indicators

Total Capacity	In the year 2020: • Shrimp: 300 kg • Seabass: 200 kg • Sole: 350 kg • Gilthead: 580 kg • Smooth: 2500 kg • Silverside: 100 kg • Camarón: 20 kg
Spare capacity	There are no surpluses.
Internal/external production	Annual internal production: • Shrimp: 300 kg • Seabass: 200 kg • Sole: 350 kg • Gilthead: 580 kg • Smooth: 2500 kg • Silverside: 100 kg • Camarón: 20 kg

2.1.4. Purchases and Logistics



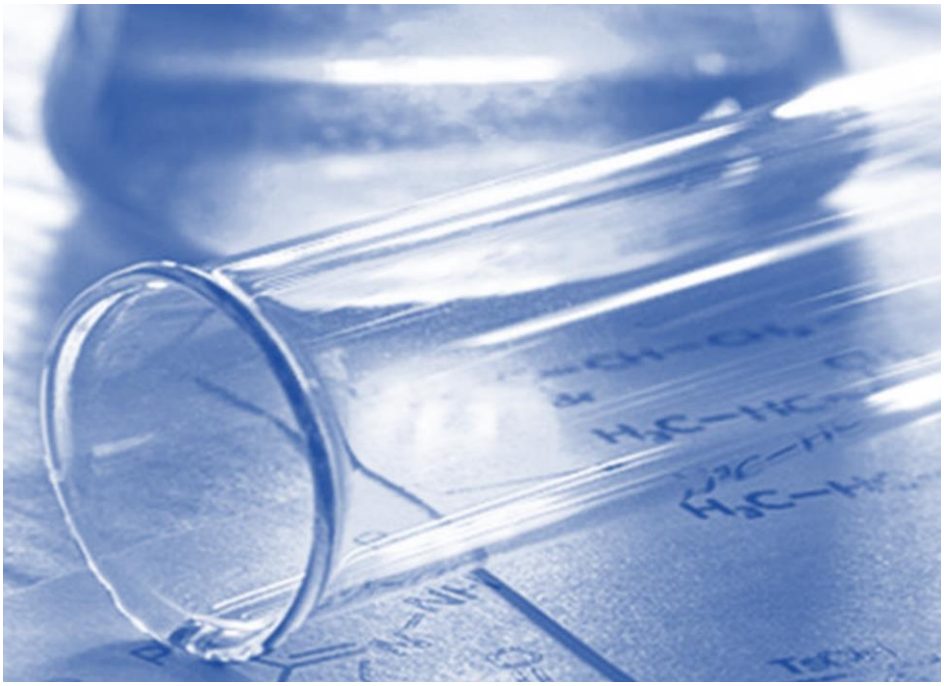
Purchases and Logistics

Driver	Rate	
Purchases	Strategic suppliers and suppliers	Material suppliers: construction companies, wood, nets, pots, etc.
	Forms and terms of payment and management of returns	30 days
	Storage and safety stock	The product is stored for a maximum of two days.
	Logistics cost per unit and minimum viable shipment	Deliveries in the area. Maximum range of distribution province of Cádiz.
	Transportation and insurance	For own use.

Indicators

% safety stock/production	N/A
Return/Sales Units	N/A
Improvement in delivery times	N/A
Other indicators of interest	N/A

2.1.5. Innovation and Quality

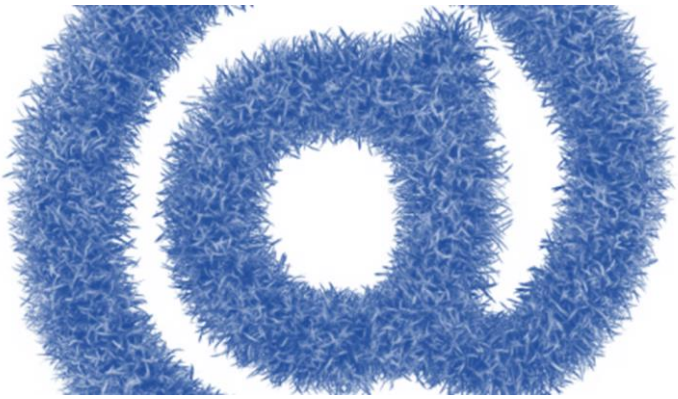


Innovation & quality

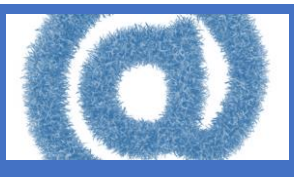
Driver	Rate	
Innovation description	I+D+i	Incorporation of new species
	Launch of new P&S	Yes
	Technological adaptation	N/A
	Communication	Social networks and website.
	Digitization	N/A
	Quality controls	There are external controls (veterinary). Three times a year the quality of the water and the products is checked. Mortality hardly occurs.
	Certifications and accreditations	Yes

Quality	Control tools	The vet's own.
	Patents and registrations	Trademark registered in March 2017.
	Regulatory compliance	Yes

2.1.6. Marketing and Communication



Marketing and Communication



Driver	Rate	
Marketing Mix: Evolution analysis from the 4 P's to the 4 C's	From Product to Consumer	N/A
	From Price to Cost	N/A
	From Placement to Canal	N/A
	From Advertising to Communication	N/A
	Communication plan on/off	N/A
	Networks and media positioning	Si
Communication	Institutional relations and PR	N/A
	Identity and corporate image	Logo

Indicators

Presence in search engines and RRSS	Yes
Website existence	Yes
Marketing budget vs Billing	Approx. 1000€ for the line 2. Tsiane: 800€ approx. (line 1). Onda Cero advertising spot: 600€. SEO Positioning Maintenance: 60€/month. Diptychs, cards, t-shirts: Approx. 1000 €.
Other indicators of interest	N/A

2.1.7. Human Resources

Human Resources

Driver	**Rate**	
Estructura	**Nº of permanent and temporary employees and the possibility of subcontracting**	Temporary: 2 Freelance: 1
	Departmental organization and communication systems	Central Dept. Maintenance Dept. Commercial Marketing Department

	Specialized and/or key personnel	Yes
	Interdepartmental permeability	No
	Outsourced departments	Accounting, tax and employment advice Web maintenance Prevention of occupational hazards
	Typology of contracts	Contract for work and service Freelance

Driver	**Rate**	
Working environment	**Measurement/Perception of work environment**	Good working environment
	Employee permanence and turnover	There is no rotation
	Remuneration systems and adaptation to the market	Aquaculture Agreement
Training Plan	**Training Plan**	No
	Training new recruits	No
	Job adaptation training	No
	Training "gap" determination	No

Human Resources

Indicators

Sufficient and qualified staff	Yes
Subcontracting capacity	At this time, there is no need to expand through outsourcing.

Staff turnover	No
Training	No
Others considered of interest	N/A

2.1.8. Financial Situation

Financial Situation

Driver	Rate	
Origin and quality of debt	**Total debt**	0€
	Type of debt according to term	N/A
	Borrowing capacity	N/A
	Financing source	Own
Investment policy	**Investments made**	90.000 €
	Planned investments	Depending on grants

	Source of funds	European Fund Grants
Investment policy	**Operating income**	32.025,09€
	Other income	N/A

Indicators

Benefit last 2 years	Net profit year 2020: 30.595,09€
Working capital	-66.009,36€
Medium term payment	N/A
Average collection periods	N/A
Financial profit	577,85€

3.1. SWOT Analysis

SWOT Analisys

D A F O

Internal Factors Analysis

Weaknesses

- Energetic resources
- Lack of Financing
- Lack of staff
- Qualified staff training

Strengths

- Knowledge of the sector
- Knowledge of traditional aquaculture techniques
- Alliances between the guild
- Quality of the products

Analysis External Factors

Oportunities

- Expand marketing
- Subsidies through European Funds
- Dissemination of the product/brand at a national level

Threats

- Covid-19 health crisis
- Campaigns for the dissemination of the estero product
- Lack of security in the area (river guards)
- Influx of the Cormorant (Nov-March)