PLASMAR

Bases para la planificación sostenible de áreas marinas en la Macaronesia

Blue Growth
For a better development of the sea

Report from Madeira archipelago

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Abstract

This report has been prepared under the project MAC 2014-2020 – Bases para la planificacion Sostenible de áreas Marinas en la Macaronesia (PLASMAR), financed by INTERREG – European Regional Development Fund.

The main objective of this report is the state of play of blue growth, including the forecasted growth of the maritime sector in the Autonomous Region of Madeira. Blue activities (including fisheries and transport) will also be projected by 2030. The statistical information was based on the Instituto Nacional de Estatística (INE), Direção Regional de Estatística da Madeira and the Direção Regional de Trabalho e da Ação Inspectiva – Serviço de Estatística do Trabalho.

Quantifying and measuring the economy of the sea still a hard task, as most of the data are dispersed across a number of formal sources, particularly in the economic, business and employment dimensions.

A survey of current and potential areas for activities related to blue growth was also carried out, based on the various entities with responsibilities in the areas of the sea, the environment, nature conservation and the sectors of uses or activities developed in maritime space.

This report will be a reference document for the development of the blue economy not only for Madeira, but also for the entire Macaronesia maritime space. Thus, the work process for its elaboration sought to bring together the contributions of analysis and proposal that reflect broad consensus around a strategy that should guide the future action of the different actors of the economy of the sea.

1 Introduction

In 2012, the European Union presented a communication intituled Blue Growth which defines and characterizes, the Blue Economy and establishes the fundamental areas of growth, which integrate blue energy, aquaculture, coastal and cruise maritime tourism, marine mineral resources and blue biotechnology.

This new paradigm seeks to identify and respond to economic, environmental and social challenges through the development of synergies between sectoral policies. To this end, interactions between the different activities, their impact on the marine environment, habitats and biodiversity.

The Blue Growth seeks to identify and support activities with a administrative obstacles to growth and promoting research, as well as developing skills through education and vocational training. It is intended, thereby, increasing the competitiveness of the economy and generating an increase in employment and staff social cohesion.

In Portugal, the first approach to blue growth was made by the National Strategy for the Sea 2013-2020. This document intends to define a route for development, in an essentially intersectoral perspective, based on the knowledge and innovation in all activities and uses of the sea, directly or indirectly related to the oceans and coastal zones, promoting greater resource efficiency in a sustained and sustainable.

In order to give an adequate response to the challenges posed by new activities, especially those that are contemplated in blue growth, the Law on the Bases of Planning and Management of the National Maritime Space was developed (Law nº17/2014 of April 10th). This diploma defines and integrates the actions promoted by the Portuguese State, aiming at ensuring an adequate organization and use of the national maritime space, with a view to its valorisation and safeguarding, with the purpose of contributing to the sustainable development of the country.

This was a decisive step for the planning of uses and activities, embodied through a plan for the planning of the national maritime space. The Situation Plan of Maritime Spatial Planning, which is being developed, intends to organize existing and potential uses and activities, and also, to identify the natural and cultural values of strategic importance for environmental sustainability and intergenerational solidarity.

This report will be fundamental, in that, it will be closely coordinated with this plan by conducting an analysis of the current state of activities and uses associated with blue growth. Other maritime sectors considered important for maritime economic growth, such as fisheries and maritime transport, will also be analysed. In order to be able to take the most appropriate measures for maritime economic development, a regional maritime economy was forecasted by 2030.

The work process for its elaboration sought to gather analysis and proposal contributions that reflect the consensus of several public entities with responsibility in the areas of the sea, the environment, nature conservation and the sectors of uses or activities developed in the regional maritime space.

The information used in this report has been compiled and synthesized, presenting in this document the data considered most relevant and with a direct impact on the regional maritime economy.

2 Geographical limits

The maritime area of the Madeira is integrated in the biogeographical sub-region of Macaronesia, in the Atlantic Ocean. The archipelagos of the Azores, the Canaries and Cape Verde Also are part of this sub region.

The maritime space of the Madeira Autonomous Region (RAM) corresponds to an area of approximately 446 108 km². About 500 times greater than the land area occupied by the islands of the archipelago, and comprises, in addition to the islands and islets, several submarine banks (Seine, Lion, Unicorn, Dragon, Susana and Ampere) distributed mainly in the north-northeast direction, being the closest (Seine), at a distance of 135 nautical miles from the island of Madeira (figure 1).

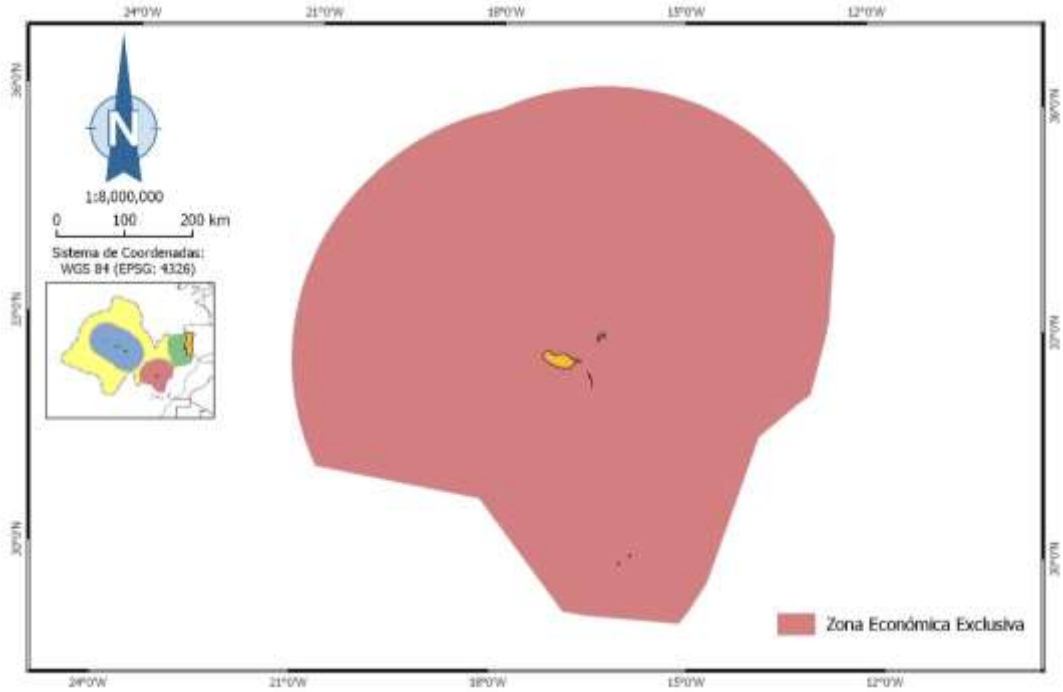


Figure 1 – Exclusive economic zone

2.1 Climate

The Madeira archipelago, due to its location, in the subtropical North Atlantic region, is characterized by its mild climate, with a low annual thermal amplitude, due to the moderating effect of the Atlantic Ocean, within the climate context associated with the region of Macaronesia.

Polar frontal surface disturbances and stationary cold depressions, as well as the Azores anticyclone, shape the climate of the Region. The direct influence of the subtropical anticyclone of the Azores and the Atlantic trade winds, protects the archipelago from the depressions that occur in the North Atlantic.

The climatic characteristics of the archipelago are also influenced by the relief and geographical orientation, which introduces differences in the values of air temperature and precipitation distribution.

This situation is clearer on the island of Madeira where the slopes regularly have a steep slope, which causes a shift between shaded areas and areas with high sun exposure. Thus, it is possible to observe many very significant microclimates (figure 2).

Figure 2 - Topography of the island of Madeira

Although the island of Porto Santo is affected by the same metrological systems, the topography presents lower altitudes, with morphological characteristics of a sub-arid climate (figure 3).

Figure 3- Topography of the island of Porto Santo

2.2 Human pressure

According to the Direção Regional de Estatística (DREM), the resident population in the RAM for the year 2015 was estimated at 256 424 inhabitants, with 5 186 inhabitants residing in Porto Santo (DREM, 2015). In the same year, the population density of the RAM was 319.9 inhabitants / km² (INE, 2015), higher than the national average, which for the same year was estimated to be 112.1 inhabitants per km² (INE, 2015). The population and economic activities are concentrated mainly on the island of Madeira along the coast. This situation will have repercussions on economic development and will put pressure on ecosystems (figure 4).

Figure 4 - Examples of human pressure in ecosystems
Vírgilio Gomes

2.3 Littoral of the islands

The coast of the island of Madeira is characterized by the narrowness of the insular platform, presenting in the southern slope a small slope that occurs until 100 meters of depth. The bathymetry presents a parallel to the coastline, and the 100 meters do not distance themselves more than 3 km from the coastline, except in the most western area of the island, the distance wave reaches 9km (Instituto Hidrográfico, 2003).

From a geomorphological point of view, the coast of the island of Madeira is constantly affected by landslides that balance the gravitational stability of volcanic buildings. About 80% of its extension is occupied by cliffs, which are characterized by impressive reaches reaching Cabo Girão at 580 m and altitude (figure 5).

Figure 5 – **Cabo Girão**
Virgílio Gomes

On the south coast of the island of Madeira, the line of cliffs is interrupted by the amphitheater of Funchal, Machico bay and the most important river valleys such as the Ribeira Brava and Socorridos riversides. The North coast is more cliffed, constituted by high and continuous cliffs being only cut by the streams of São Vicente or São Jorge, Ribeira Seca and Ribeira da Metade. The rapid retreat of the cliffs, boosted by the rapidity of the marine erosive processes, causes some streams to be suspended and precipitate in cascade or drain through a connecting throat where the slope can increase to the vertical (Ribeiro, 1990: 17-18).

The island of Porto Santo emerged through an ancient reef. Currently, is constituted for a dune string in the south coast of the island. The Desertas islands constitutes the emergent part of an underwater crest. The current shape of this ridge reflects the occurrence of large strand movements that contributed significantly to the extremely cliff-like character that characterizes the coastline of these islands. Relatively to the Selvagens islands, the Selvagem Grande coastline is characterized by a shoreline with lowlands. The Selvagem Pequena area varies according to the tides, with an area of 0,65 km².

3 The regional maritime economy

The framework of the Integrated Maritime Policy, the National Strategy for the Sea 2013-2020 which includes the Blue Growth, the Sea Madeira Strategic Reference Plan 2030 as well as the Marine Strategy Framework Directive for the Madeira subdivision, establish a conceptual definition of sea. The economy of the sea comprises all the economic activities that are carried out at sea, directly and indirectly, and which privilege the value chain in which they are inserted.

Most of these activities are present in RAM, although they are divided essentially into three groups (Lopes, 2016):

- Consolidated activities in business and market terms, as is the case of cruise tourism and recreational boating;
- Activities that are still at an embryonic stage, such as aquaculture;
- Activities that are stagnant, such as shipbuilding and ship repair.

The data presented in the following table was based on the Instituto Nacional de Estatística (INE), the Direção Regional de Estatística da Madeira and the Direção Regional de Trabalho e da Ação Inspectiva – Serviço de Estatística do Trabalho, the Sea Madeira Strategic Reference Plan 2030, the master dissertation Proposal for the Constitution of a Sea Cluster in the Autonomous Region of Madeira and the Role Performed by the Maritime Spatial Planning. It was intended to obtain a series of indicators representing the weight of the activities of the sea in the regional economy.

The statistical information for the maritime economy for 2015 is relatively scarce or confidential, so it was decided to analyse between the years 2007 and 2014.

Through the table 1 mentioned at the annex, it is possible to remove the following set of information:

- In 2014, about 0,6% of the enterprises in the Madeira archipelago were related to the economy of the sea. This figure was 0,2% lower than in 2007;
- It is estimated that about 1.1% of the personnel employed in business are related to maritime activities. This value may be higher because we have indicators that are missing;
- Approximately 2,3% of volume business. In 2007 the value was close to 1,9%;
- Around 1,6% of the business GVA generated, when in 2007 it represented 2,1%.

One of the problems encountered was the fact that the existing information was widely dispersed. In addition, there are data that cannot be available due to statistical secrecy, as happened in this evaluation, and therefore limited the analysis of economic activity.

In the recent years, maritime economic activity has been the target of several investments: support to companies, development of maritime economic activities and above all in the generation of employment. According to the Sea Madeira Strategic Reference Plan 2030, the RAM received the following community funds between 2007-2013:

- PO Intervir+ (FEDER) – The approved projects of companies with activity in Sea sectors amounted to 3 million euros;
- PO Rumos (FSE) – Approved project worth 44 thousand euros;
- PROMAR – Were approved 9,68 million euros of private investment and 767 thousand euros in public projects.

4 The blue economy in the Madeira Archipelago

The Blue Growth strategy aims to support sustainable growth in the marine and maritime sectors in the long term, recognizing the importance of the seas and oceans as engines of the European economy, with enormous potential for innovation and growth.

The Blue growth is the contribution of the integrated maritime policy towards achieving the Europe 2020 objectives for smart, sustainable and inclusive growth.

In the European Union, the blue economy represents 5,4 million jobs and gross value added of almost 500 billion per year. Even so, in several areas, highlighted in the strategy, there is still scope for further growth.

The interactions between the seas and oceans are increasingly intense and varied, creating unprecedented added value for Europe. The increasing number of activities and uses in European maritime areas and their increasing cumulative effect leads to certain conflicts between different entities operating in the territory, adding the economic impact from this. In part, these conflicts are resolved separately, leading to inefficiencies, inconsistencies and conflicts of use.

The maritime space is mostly unexplored. To exploit its potential, maritime economic activities need to be combined, harnessed alongside innovation. Maritime economic activities need to be sustainable, passing by for an integrated approach with a long-term focus and responding to existing resources and climate and environmental challenges. Given the fragility of the marine environment, the blue economy must be sustainable and environmental concerns. Efforts should be made to reduce the negative environmental impacts of maritime activities, such as pollutant emissions and the discharge of harmful substances.

The blue growth provides policy-makers at European and sea-basin level with a comprehensive, robust and consistent analysis of possible future policy options for developing smart, sustainable and inclusive growth of the oceans, seas and coasts.

The blue growth, encompasses five sectors of activities, directly and indirectly related to the sea (see table 1 and 2 in the annex):

- Aquaculture;
- Biotechnology;
- Coastal and maritime tourism;
- Mineral resources.

The analysis of the potential for job creation, to research and development for technological change and innovation, points these sectors as crucial for the development of the maritime economy.

These five sectors would have to win with realistic policies that give the private sector a leading role in the process that allows the blue economy to reach its potential for sustainable growth.

Coastal and maritime tourism, international vessel registration, ports, logistics and shipping, as well, aquaculture production, are the structural pillars of the economy of the sea in the Region, which have grown in recent years and play a key role in blue growth. These economic sectors are very dynamic since they end up invigorating other activities or sectors, both upstream and downstream.

For the best decisions to be taken to the blue growth, in this report, an analysis of the current and potential state of the blue economy sectors will be carried out. so that the regions of Macaronesia can draw the greatest potential and give a new to the outermost regions of the European Union.

If appropriate measures are taken, blue growth will contribute to boosting the ultraperipheral regions of Macaronesia, giving it a new geostrategic and economic position.

It is important to highlight the importance of the planning and management of the national maritime space, consubstantiate through the Plan of Situation of the Planning of the Maritime Space. This document is based on Decree-Law no. 38/2015 of May 12th that develops the Basic Law of the Policy for Planning and Management of the National

Maritime Space, namely, in defining the legal and economic regime applicable to the private use of maritime space, within 200 nautical miles.

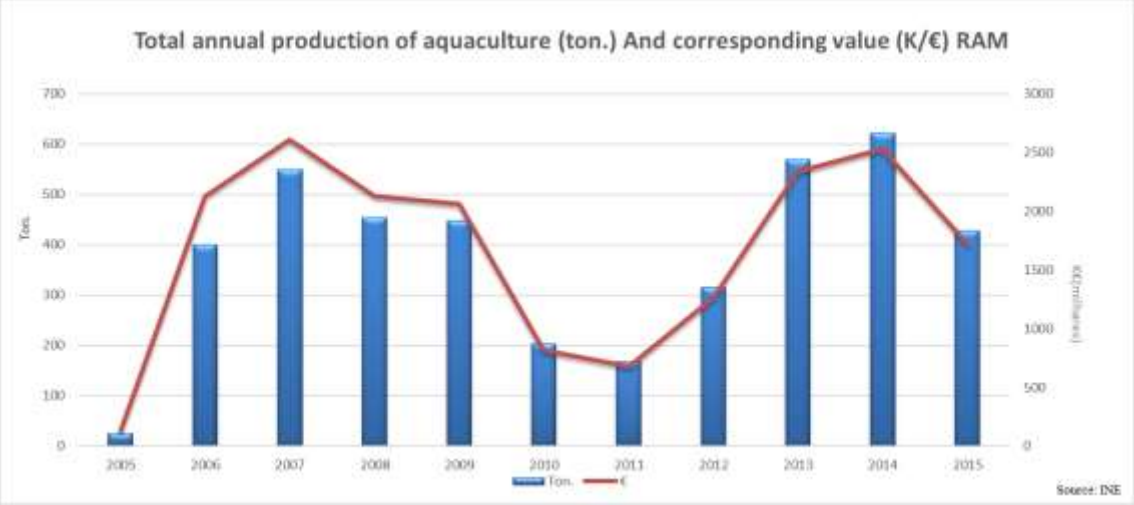
The existence of several regulators and authorities, with responsibilities over the maritime space and the administrative complexity associated with the public maritime domain and the exploitation of the resources of the sea, penalizes the conditions of the exercise of multiple activities related to the sea.

Next, the sectors in the RAM that can contribute to the blue growth will be analysed.

4.1 Aquaculture

Madeira Archipelago has a significant potential for the development of marine aquaculture. The initial studies from early 1990´s highlighted the oceanic oligotrophic qualities of seawater and the stable and high mean sea temperature compared to the Mediterranean Sea. Considering the lack of coastal space priority was given for the development of offshore fish farming systems (Andrade and Gouveia, 2008).

By 2004, following the success of a government pilot project, two aquaculture companies were established and started offshore production of seabream. Presently, the total output production of both enterprises reaches 500 - 600 tonnes per year (graphic 1) and about 70% of the fish is shipped to mainland Portugal and other markets. The development of this young industry has been supported by the Mariculture Centre of Calheta. Established in 2000, this government unit assists private entrepreneurs, promotes research and innovation, and provides juvenile fish produced in its own hatchery facilities.



Graphic 1 - Total annual production of aquaculture (ton) and corresponding value (kg/€) in the RAM Source:INE

In 2016, the Regional Government launched new regulations concerning the selection and establishment of marine space for aquaculture enterprises – Plano de Ordenamento da Aquicultura Marinha da Madeira (POAMAR), Resolução nº 1025/2016, 28 de Dezembro de 2016, Jornal Oficial, série I, nº227.

Five zones of aquaculture interest (ZIA) were established, each with 1 up to 4 areas of 1 km2 by farm, leading to a total of 11 areas available for aquaculture farms (figure 6).

Figura 6 – Interest zones for aquaculture

There has been a growing interest of entrepreneurs requesting the use of these areas and prospecting.

In 2017, a new farm of 550 tonnes capacity for seabream was installed and a previous farm was expanded from about 300 tonnes capacity per year to 800 tonnes capacity, to produce seabream and amberjack.

4.2 Biotechnology

There are a few companies involved in biotechnology in Madeira, particularly dealing with marine resources and environment. The activities of these companies are mostly based in research and development projects. The UBQ, Lda. is a microenterprise, associated with a research centre of the University of Madeira - ISOPlexis Germplasm Bank - in a Horizon 2020 project, aiming at the development of macroalgae research and production. The production of algae is to be used as food and iodine supplement, a pioneering project in the Region (figure 7).

Figure 7 - Algae destinated to alimentation. In this moment, the UQB, Lda. Start to develop bread with algae.
Source: UBQ, Lda.

MadeBiotech C, R&D S.A., a company established in Madeira Free Trade Area, also in cooperation with the University of Madeira had a research project recently approved for the development of refine oils obtained from fisheries by-products.

In Porto Santo Island, near the port area, there is a microalgae production and processing plant using vertical bio fences – Buggy Power S.A., in association with the Madeira Electricity Company. The plant is still at installation stages and is intended to produce biofuels and several products of interest for the chemical, pharmaceutical and food industries (figure 8).

Figure 8- Biofuel production company
Isabel Lopes

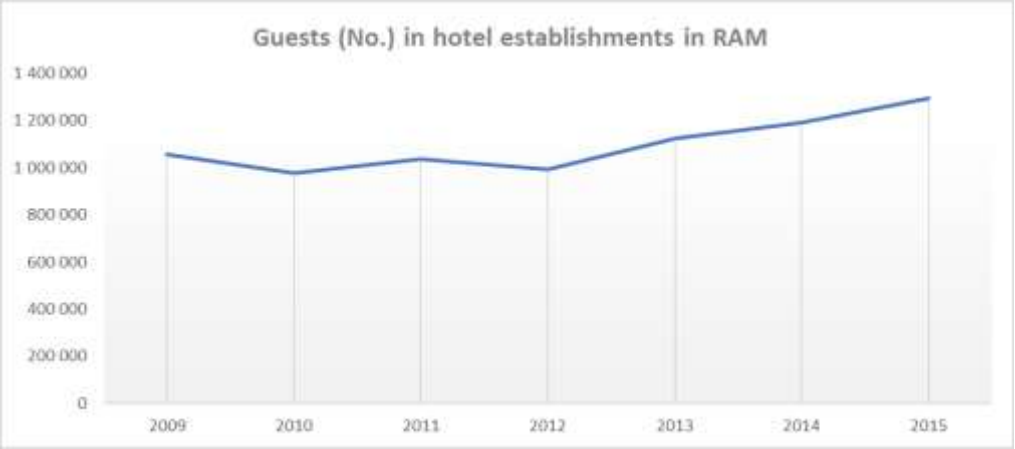
4.3 Tourism

4.3.1 Coastal and Maritime Tourism

The Tourism Planning Plan of the Autonomous Region of Madeira (POTRAM) estimates that the maritime-tourism activity will have involved around 100,000 passengers per year in 2013. On the other hand, the number of tourists who visited the Region (1,082,750) in 2013 makes it possible to admit that about 10% of tourists sought organized sea trips.

According to the International Fund for Animal Welfare (IFAW), in 2008, based on the growth of this activity, the Region was in the top 10 of the countries with the highest growth rate and had approximately 60 thousand individuals who participated in the activity of the whale watching. In 2007 it was estimated this activity caught about 58 thousand tourists a year attending this activity, moving 1.5 million euros.

Tourism activity is one of the pillars of the regional economy. If we analyse the number of guests in hotel establishments, we can see that it has grown in recent years, which can be an important factor for the development and growth of the economy of the sea, especially in tourist activities involving the sea, as is the case Mentioned above (graphic 2).



Graphic 2 – Guests (no.) in hotel establishments in RAM
Source: Instituto Nacional de Estatística

4.3.2 Recreational Boating

Recreational boating is an important activity that has grown in recent years in the Region due to the natural conditions, landscape and safety offered in the berthing areas for the development of its practice. Recreational boating is a complementary product of sun and beach tourism, promoting the creation of differentiated employment and the emergence of upstream and downstream activities, and also contributes to the defence of environmental values, to a greater connection of the population to the sea and to the dynamism of local communities (figure 9).

Figure 9 - **Funchal marina**
Isabel Lopes

The recreational boating is a concept that promotes the contact with the sea, by which it includes the sport activity, recreational navigation, maritime-tourist activities. The existence of a potential regional market for the development of this activity, gives it a significant role in the development of the regional blue economy and allows territorial development with tourism potential.

4.3.3 Water sports activities

Sports activities play a key role in the Region, due to the physical conditions the region offers. According to the Study of demand and sports consumption of the population of the Autonomous Region of Madeira, the natural spaces / mountains / sea, appear as the third option (11.6%) in the places for the accomplishment of the sport that affirmed to practice some type of activity with regularity (table 3).

Table 3 – Location of sports practice

Places of practice	Frequency
Natural Spaces / Mountains / Sea	65 (11,6)
Fitness Center / Gym	100 (17,9%)
Public facilities	180 (32,2%)
Clubs	74 (13,2%)
Public road / open spaces "promenades	118 (21,1%)
Others	22 (3,9%)
Total	559 (100%)

Source: Colaço, 2009:79

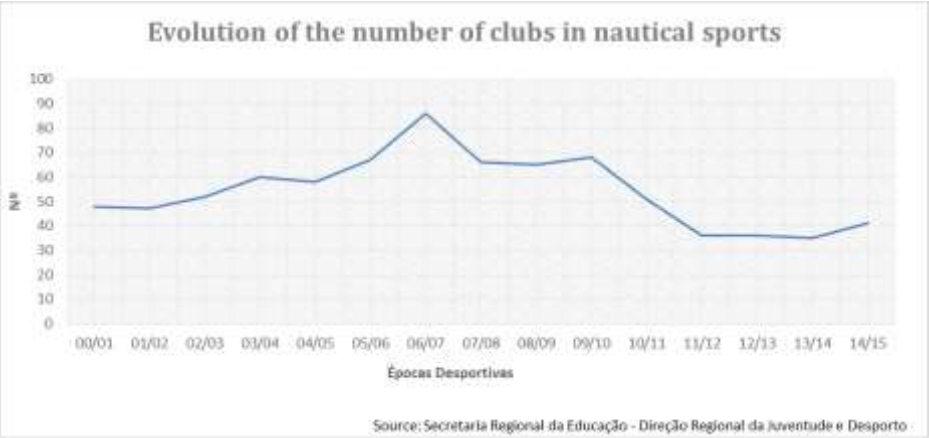
Sports activities have been considered in the regional government programs, and their support in the new model of sport support approved by the Sports Support Regulation (RAD) has been substantiated. From the definition of the new model of support to the sport until the sporting season 2015/2016, nautical modalities were granted around 1,6 million euros. Since que sport season 2012/2013, the Secretaria Regional da Educação - Direção Regional da Juventude e Desporto, gave the following financial support, that are listed in table 4.

Table 4 – Support for nautical modalities

sport season	Total
2012/2013	342.620,25 €
2013/2014	397.597,53 €
2014/2015	421.977,70 €
2015/2016	413.280,04 €
Total	1.575.475,52 €

Source: Secretaria Regional da Educação – Direção Regional da Juventude e Desporto

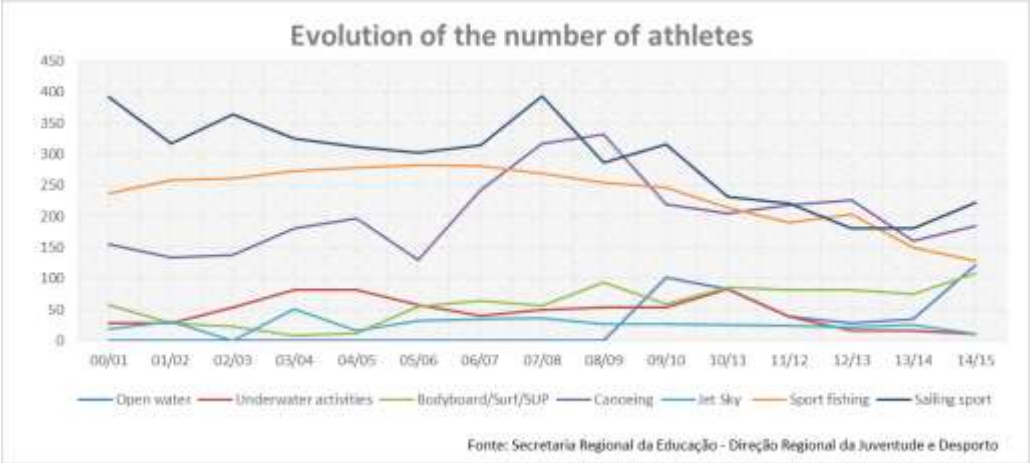
In the years under analysis, it is possible to observe the existence of some fluctuations in the number of clubs in nautical sports, and in the 2006/2007 season there were the largest number of clubs related to this activity (graphic 3).



Graphic 3 – **Evolution of the number of clubs in nautical sports**
Source: Secretaria Regional da Educação – Direção Regional da Juventude e Desporto

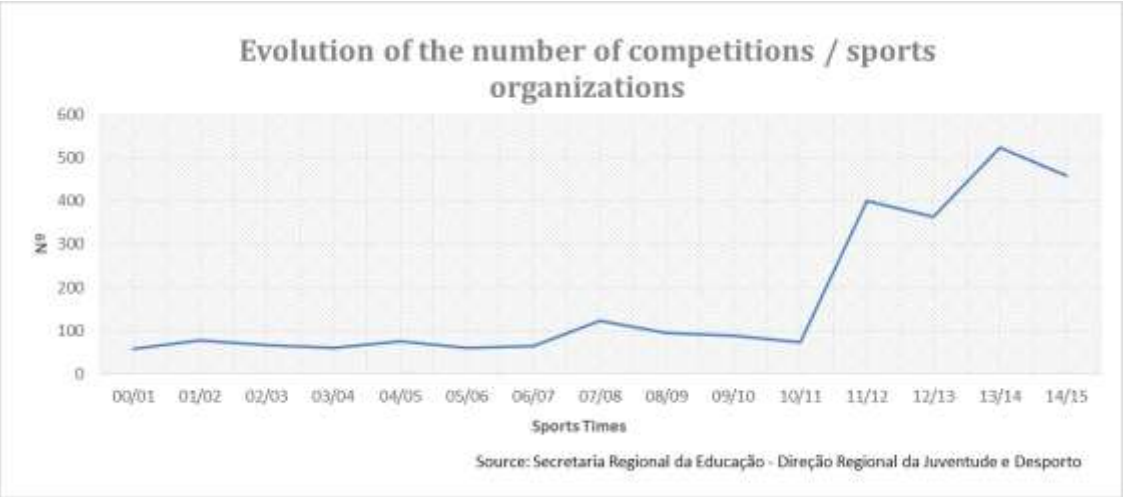
In the sports season 2014/2015, there were 41 sports entities related to the sea, representing about 27% of the total number of sports clubs in the region (LOPES, 2016).

The graphic 4 shows the evolution of the number of athletes. Sailing (28%), canoeing (23%) and sport fishing (16%) correspond to modalities with more federated athletes. In the 2014/2015 sports season, in the total number of federated athletes registered, the number of athletes in nautical modalities represented 5%.



Graphic 4 – Evolution of the number of athletes
Source: Secretaria Regional da Educação – Direção Regional da Juventude e Desporto

The evolution of the number of competitions / sports organizations, there has been no stability in their performance. From the sports season 11/12 there was a strong growth in the number of competitions / sports organizations, registering in the sporting season 14/15, about 460 competitions / sports organizations. This positive value is due to the modification of the system of support granted to sport (Lopes,2016) (graphic 5).



Graphic 5 – Evolution of the number of competitions/sports organizations
Source: Secretaria Regional da Educação – Direção Regional da Juventude e Desporto

4.3.4 Cruise Tourism

Cruise tourism takes an important position in the region. The geostrategic location, close to the Mediterranean, North Africa and the Canary Islands, as well as the crossing of the connecting routes between the European and American continents (Figueira de Sousa, 2001), allowed the region to become an important cruise port.

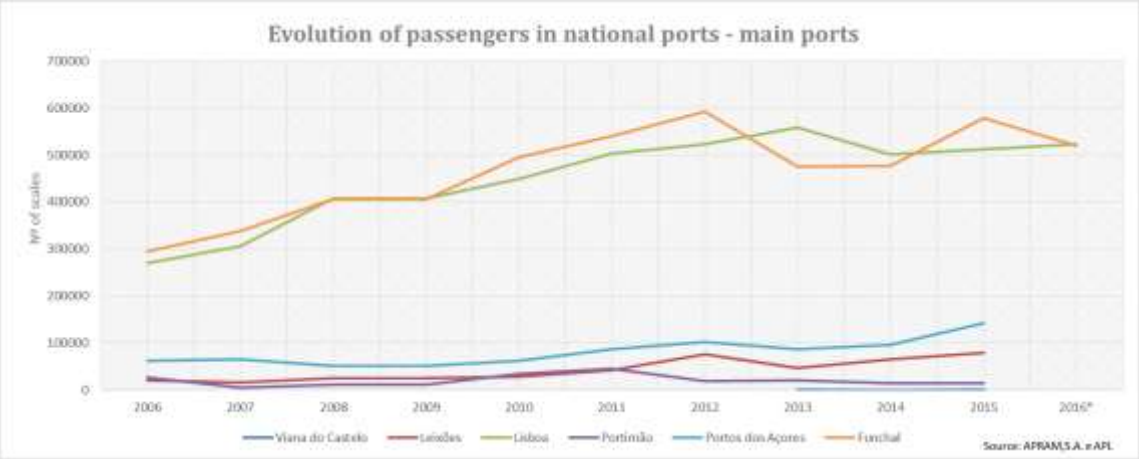
At the moment, the Region is inserted in the following cruise circuits (figure 10):

- Between the RAM and the Canary Islands Archipelago and North Africa;
- Circuits operating from the Atlantic facade of Europe and the Western Mediterranean;
- Circuits operating from Northern Europe, particularly from the UK.

Figure 10– The RAM in the circuits of the region of Atlantic cruises and in the circuits of cruises between America and Europe
Source: Figueira de Sousa, 2004.

In the national context, the port of Funchal and the port of Lisbon constitute the main cruise ports. According to the annual statistics of APRAM, S.A., the port of Funchal in 2015 ended up achieving the national leadership when registering with 578 492 cruise

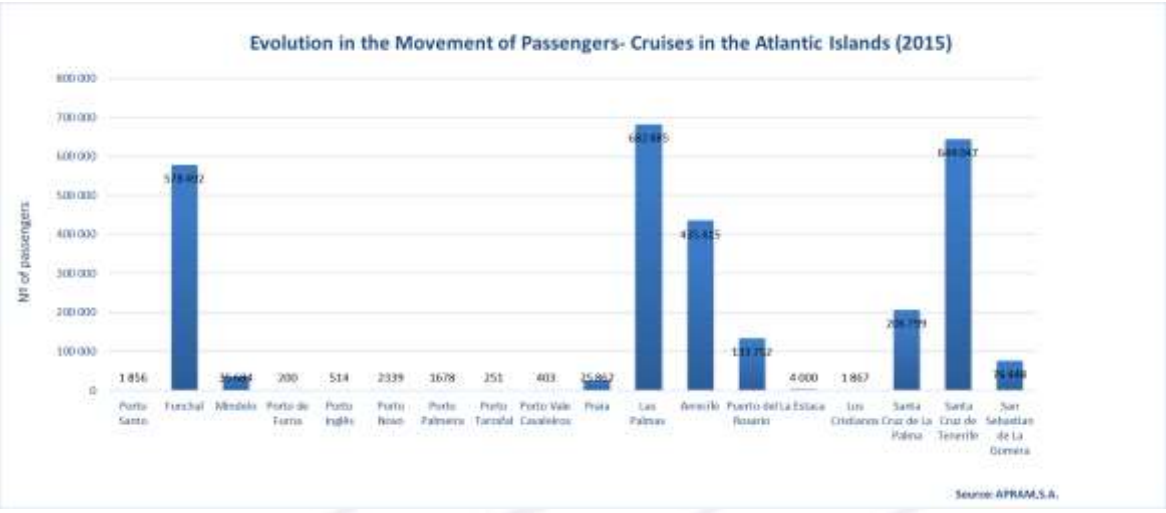
tourists and 308 scales, leadership that would have belonged previously to the port of Lisbon in the homologous period (graphic 6).



Graphic 6 – Evolution of passengers in national ports – main ports
Source: APRAM, S.A. and APL

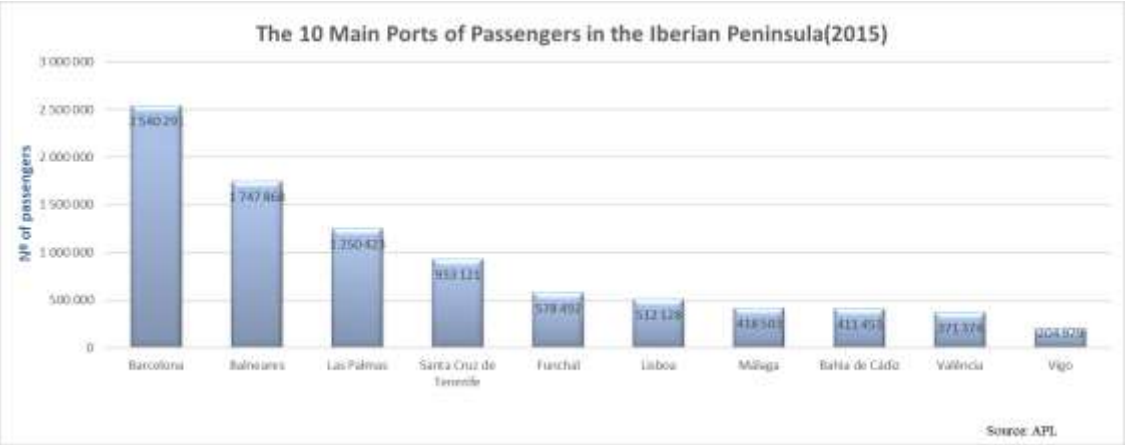
According to the PIETRAM report 2014-2020, the average stay of vessels in the port of Funchal is 14 hours and is considered a reasonable period for a stay when compared to the same type of operations in other regions as in the case of the Mediterranean. It is estimated that the average cost per passenger contributes to the regional economy by around 40.6M € (APRAM, 2015 apud Madeira-Canary Islands Competitive Intelligence Study 2004/2005).

In 1995 a cruise area was created on the islands of the Atlantic (Cruises in the Atlantic Islands). This cruise line benefits from the geographical distance between the archipelagos and the specific characteristics of the regions (graphic 7).



Graphic 7 – Evolution in the movement of passengers – cruises in the Atlantic Islands (2015)
Source: APRAM, S.A.

The port of Funchal occupies is also among the main cruise destinations in the Iberian context (graphic 8).



Graphic 8 – The 10 main ports of passengers in the Iberian Peninsula (2015)
Source: APL

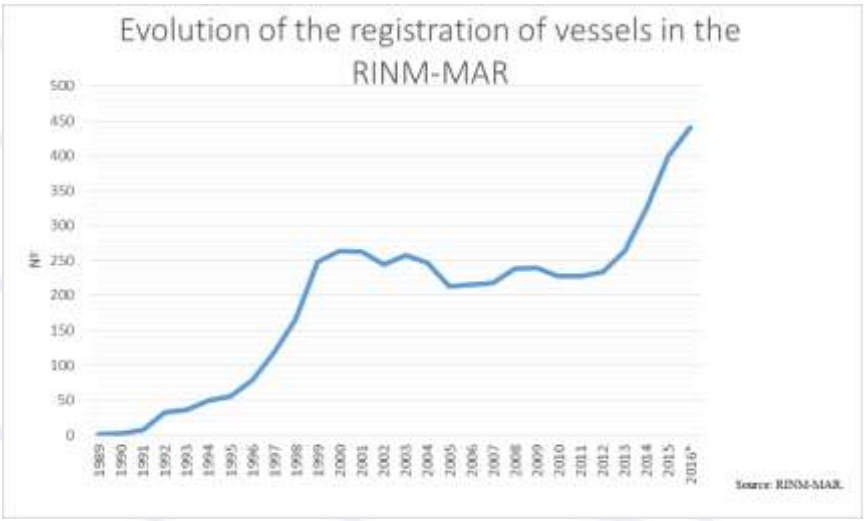
4.3.5 International ship registry of Madeira (RINM-Mar)

The International Ship Registry of Madeira (RINM-Mar) was established with the aim of avoiding the process of flagging out ships for other flags, attracting new ship owners and ensuring that ship safety standards were met.

The registration offers an attractive tax regime applicable to vessels and shipping companies duly licensed to operate within the scope of the International Business Centre of Madeira. As an EU register, the RINM-MAR allows full access to community waters and ensures the supervision of all registered vessels.

RINM-Mar is the second Portuguese registry and is among the highest quality international registrations. All international conventions to which Portugal is a signatory are fully applicable and respected by RINM-Mar.

RINM-Mar accepts registration of commercial vessels, oil rigs, commercial or private yachts and recreational craft. All the measures and efforts employed by RINM-Mar have led to a positive development in the register of ships (graphic 9). Commercial vessels have a larger register (graphic 10).



Graphic 9 – **Evolution of the registration of vessels in the RINM-MAR**
* Until April 30, 2016

Source: RINM-Mar

Graphic 10 - **Types of vessels registered in RINM-Mar**
Source: RINM-MAR

Until 30 April 2016, the average age of commercial vessels was 11,4 years, one of the EU's most positive averages, which puts RINM-Mar at the highest level of international maritime records. The main registers of RINM-Mar trade vessels in 2016 came mainly from Germany (66%), Italy (11%), Spain (8%), Portugal (4%) and Norway (4%).

4.4 Mineral resources

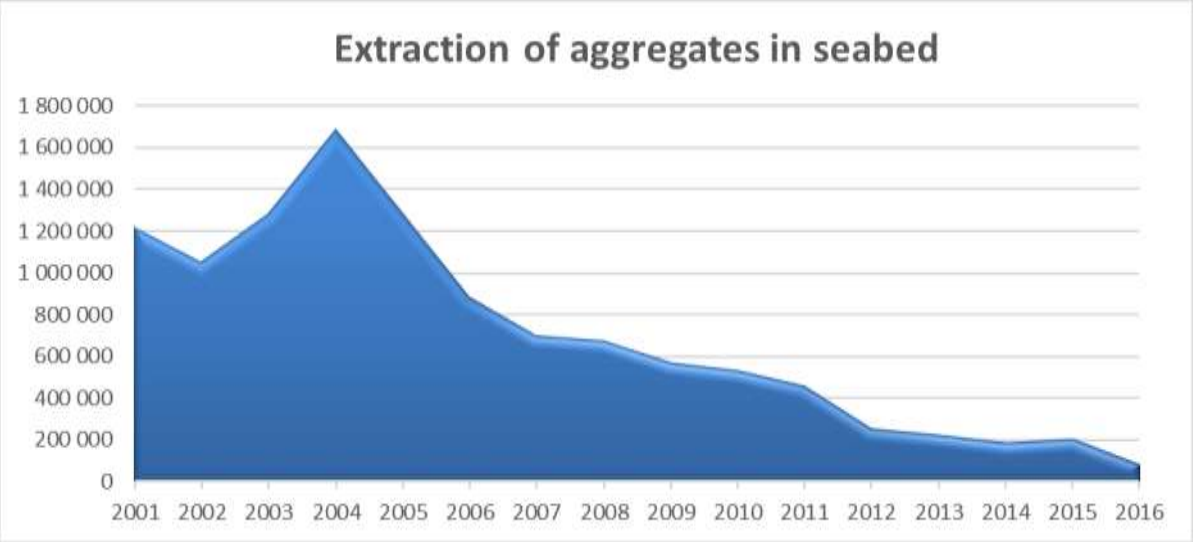
The extraction of geological resources in the Region focuses on the extraction of aggregates, an activity considered important in the context of the regional economy, since there are no sandy deposits exploitable in the terrestrial space.

Aggregates extraction is carried out in the sea bed on the south coast of the island of Madeira, particularly in the western sector, between Paul do Mar and Cabo Girão - Ponta do Leão, Madalena do Mar and Lugar de Baixo / Tabua. The extractive zones of Campanário and Ribeira Brava were decommissioned after the installation of the

Figure 11 – Areas for aggregates extraction
Source: Secretaria Regional do Ambiente e Recursos Naturais - Direção Regional do Ordenamento do Território e Ambiente

aquaculture area and the construction of the Ribeira Brava bathing area, respectively. These zones were reactivated for emergency reasons briefly in 2010 (figure 11).

Extraction of aggregates is monitored by the Direção Regional do Ordenamento do Território e Ambiente, through GPS devices installed on board and a computer platform of its own. The aggregates are discharged at the terminal of Porto Novo. The graph 11 in the annex shows the evolution of the inert discharge since 2001.



Graphic 11 – Extraction of aggregates in seabed
Source: APRAM, S.A.

The aggregates volumes have declined substantially in recent years, following the boom in public works witnessed at the beginning of this century(Lopes,2016).

The morphology of the seabed of the Madeira subdivision, which is part of the Macaronesian sub-region, is the natural extension of the funds of the other national marine waters in which the MSFM is applied. It presents a diverse morphology, since it includes several physiographic domains, namely, subsea mounts, abyssal plains and zones of fracture. But so far, it is little known.

4.5 Renewable ocean energy

The RAM, as an outermost island region, away from major continental energy networks, entails high costs of supply and conversion due to transport and the smaller scale of markets and infrastructures. This situation has become more worrying about the doubling of energy demand over the last 20 years, which has resulted in the appreciation of renewable energy sources.

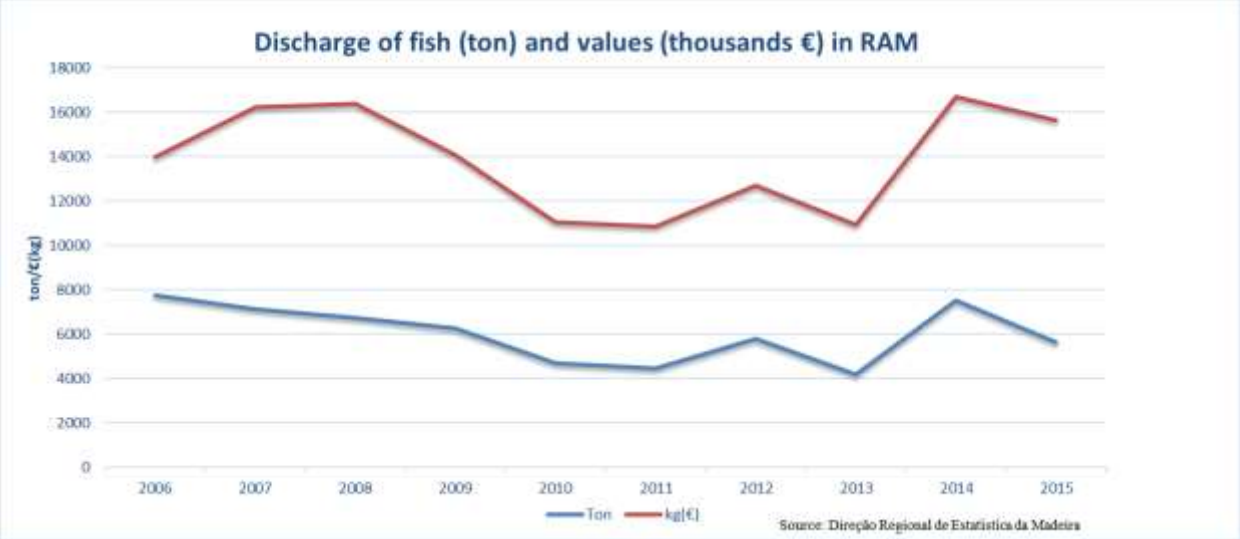
According to Sustainable Energy Action Plan (2012) from Agência Regional da Energia e Ambiente da Região Autónoma da Madeira (AREAM), RAM is highly dependent on fossil fuels, with the transport sector (54.9%) and the tertiary sector (21.5%) being the ones that use more energy.

5 Other maritime sectors

5.1 Fisheries

The geographic, physical and biological characteristics of the Madeira Archipelago are determined by the narrowness of the continental shelf, the reduced continental slope and an abyssal surface with an average depth of around 4,000 meters, and oligotrophic waters. Due to these conditions the resources are scarce, and the fishing activity is based on a set of pelagic (tunas and tunas related species) and bathypelagic species (black scabbardfish), that usually account for about 80 % of the total catches (SRA,2014).

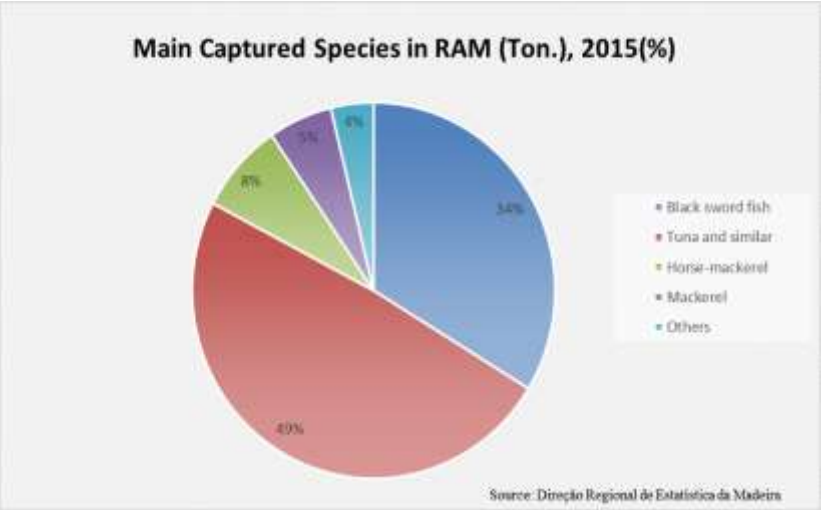
The low by-catch rate, the impact of fishing on adult species as well as the low environmental impact due to the ban on trawling determine their artisanal, selective and sustainable character. The graph 12 in the annex, shows the fish landings in the Madeira. In 2015, there were 5641 tonnes of fresh and chilled fish traded at the ALC stock lots, traded in stock at an average value of € 2.84 / kg, corresponding to € 15.6 million.



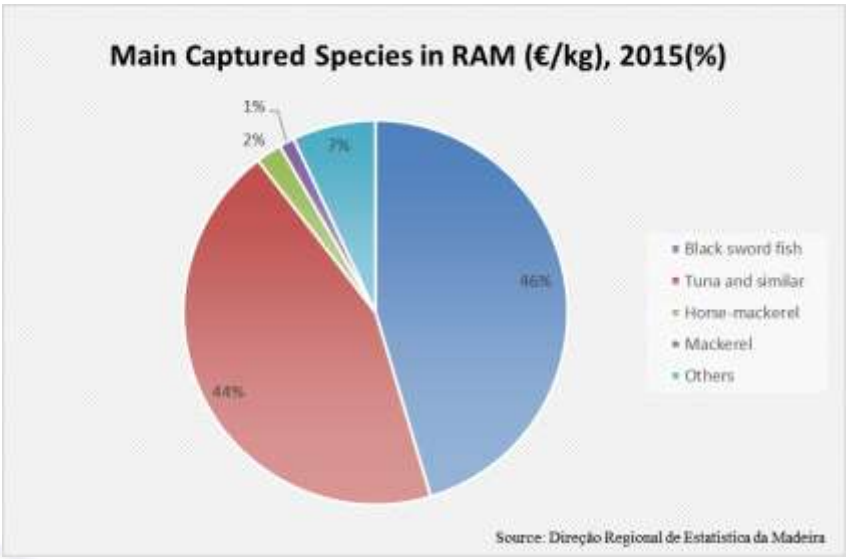
Graphic 12 – Discharge of fish (ton) and values (thousands €) in RAM

Source: Direção Regional de Estatística da Madeira

The graphs 13 and 14 in the annex corresponds to the landings of several dozen marine species in 2015, in the three auctions (Funchal, Caniçal and Porto Santo) and four fish reception stations (Câmara de Lobos, Madalena and Paul do Mar and Porto Moniz) in operation in the islands of Madeira and Porto Santo.

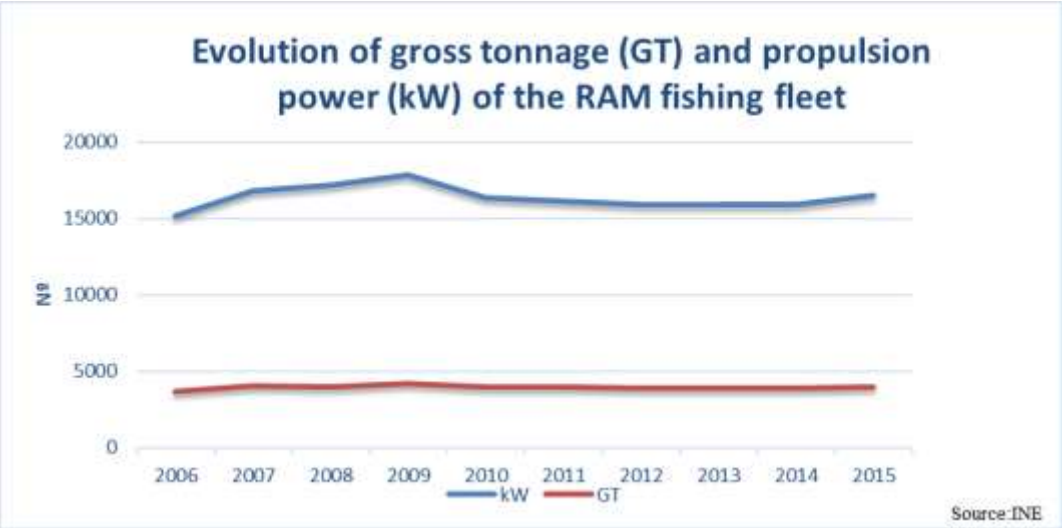


Graphic 13 – Main captured species in RAM (ton) 2015 (%)
Source: Direção Regional de Estatística da Madeira



Graphic 14 – Main captured species in RAM (€/kg), 2015 (%)
Source: Direção Regional de Estatística da Madeira

The artisanal character of the fishing activity in the RAM is marked by small vessels with a capacity of approximately 4 000 GT and with an approximate power of 16 000 kW (graphic 15).



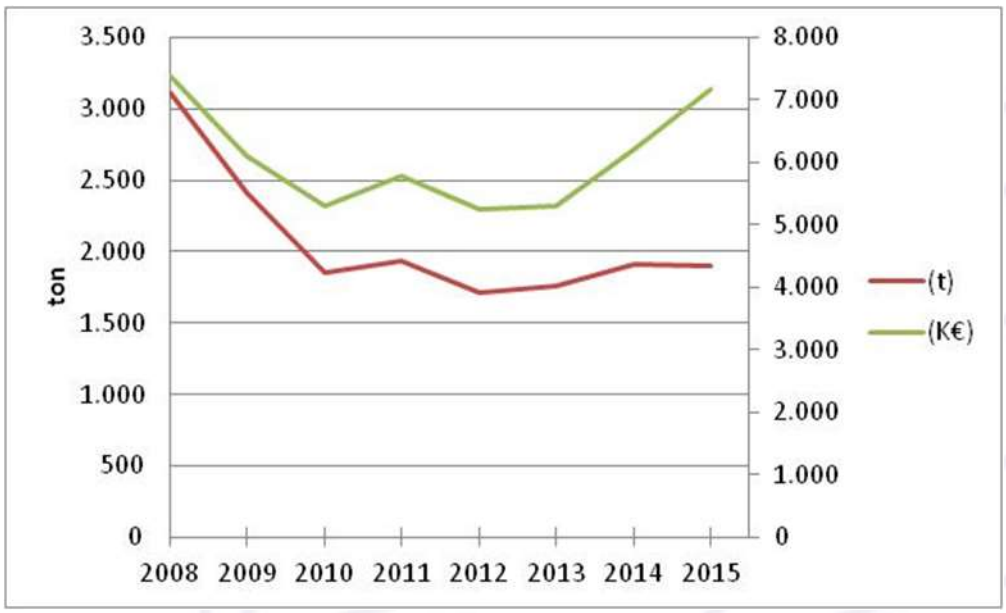
Graphic 15 – Evolution of gross tonnage (GT) and propulsion power (kW) of the RAM fishing fleet
Source: INE

The fishing gear used varies according to the type of target fish species. Bellow we analyse in more detail the commercial fishing developed by the local fleet active in the EEZ of RAM.

5.1.1 Deep Sea Fishing (Black Scabbardfish)

The fishery is practiced in an artisanal way with the capture of adult black scabbardfish, with by-catch being usually small and consisting mostly of species of no commercial value, except for deep-sea sharks.

The graph 16, shows two distinct periods: between 2008 and 2010 there is a decrease in landings. From 2010 there is stabilization of landings due to the implementation of two fishing effort adjustment plans which reduced the number of vessels in this segment of the fishing fleet.



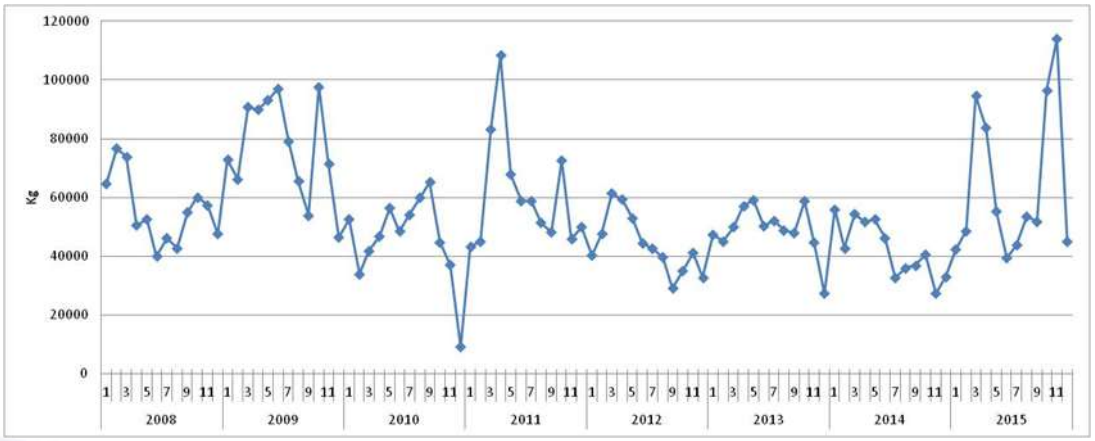
Graphic 16 - -Discharge (ton) and corresponding economic values of the first sale at auction (secondary axis: K €), in the period 2008-2015
Source: Secretaria Regional de Agricultura e Pescas – Direção Regional de Pescas

Thus, in the last six years there were average landings of around 1844 tons per year. The economic value generated by the first sale of black scabbardfish at present is over € 7m, marketed at average prices of € 3.56 / kg for trade (fish mongers, supermarkets etc.) and € 3.83 / kg for the industry, the later responsible for the acquisition of 79% of the landings of this species.

5.1.2 Tuna fishing

The tuna harvest in Madeira is seasonal, usually starting in March of each year, with the appearance of bigeye tuna (Thunnus obesus) that reaches the maximum catch around May. In June catches of this species decrease significantly and the skipjack (Katsuwonus pelamis) becomes the target species of the fishery, with maximum landings in September and October. The remaining tuna species have a sporadic, irregular occurrence with less significant catches.

In 2015 there were 42 fishing vessels registered for tuna catches. About 25 of these vessels use live bait and are predominantly dedicated to the "tuna" métier, using the technique of “jumping and rod fishing”. In the period under review, these vessels carried out 858 trips, corresponding to approximately 2237 fishing days (graphic 17).



Graphic 17 - Discharges of small pelagics by the slave fleet of Madeira in the period 2008-2015, broken down by month
Source: Secretaria Regional da Agricultura e Pescas – Direção Regional de Pescas

5.2 Port activity

The ports assume a relevant position, especially in an outermost island region, in order to "constitute a door for the rest of the world and fully assume the gateway function attributed to these infrastructures" (Figueira de Sousa, 2004: 1).

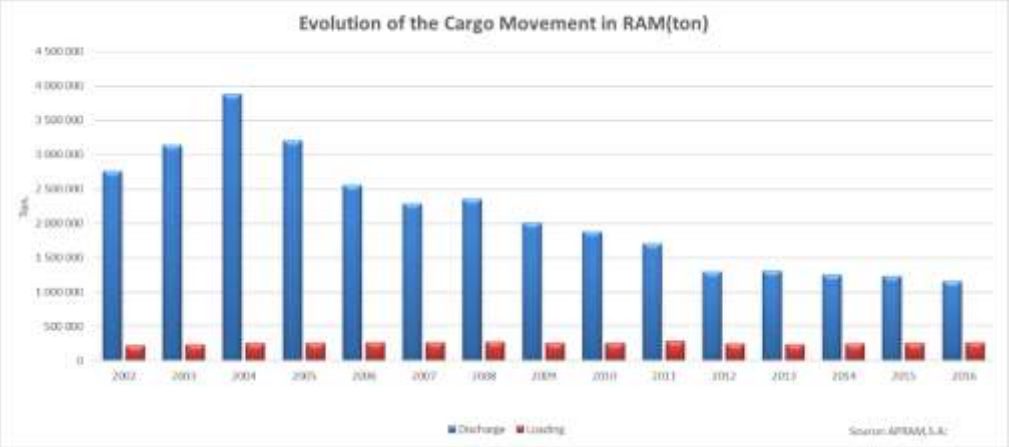
In recent years the main ports of the Region have been the target of several modernizations, allowing their constant adaptation to the needs of the archipelago (Lopes, 2016).

The APRAM, S.A. - Administration of the Ports of the Autonomous Region of Madeira S.A., better known as Portos da Madeira, is responsible for the administration and jurisdiction of most of the port areas in the Madeira archipelago.

The overall movement of cargo in the ports of the RAM, for the years under review, reached its highest value in 2004, with more than 3.5 thousand tons. Between 2008 and 2012 the variables related to container shipping, freight shipping and number of ships

have fallen due to economic instability that has impacted the country and the region. This trend continued in 2016 with 1.5 thousand tons of goods moved.

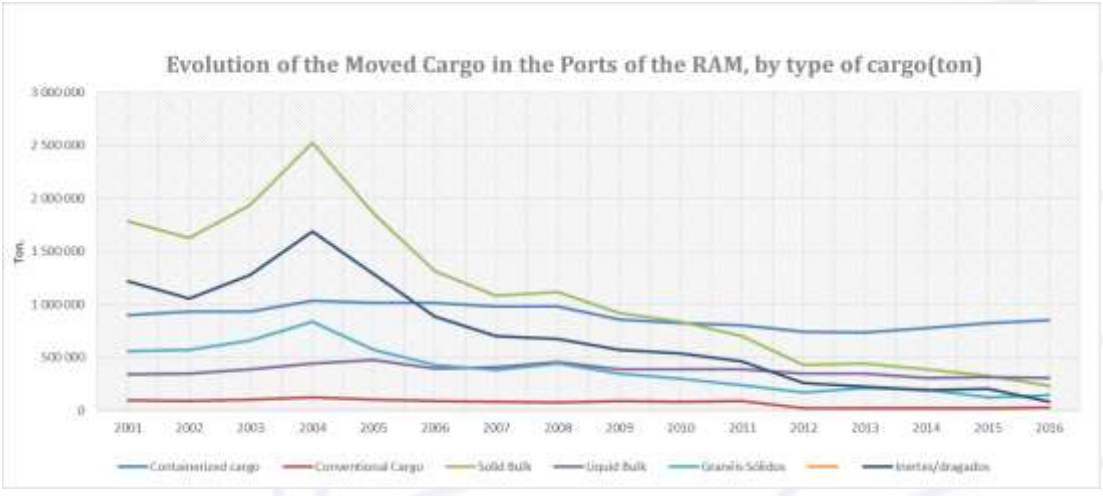
Approximately 82% of the goods handled are imported. It comes mostly from the rest of the national territory (89%). Exports account for 17% of the total regional merchandise movement. These have remained constant in recent years. Export support from the EU may be one of the factors that have contributed to this stability (Lopes, 2016). About 99% of the exports are destined to the national territory (graphic 18).



Graphic 18 – Evolution of the cargo movement in RAM (ton)
Source: APRAM ,S.A.

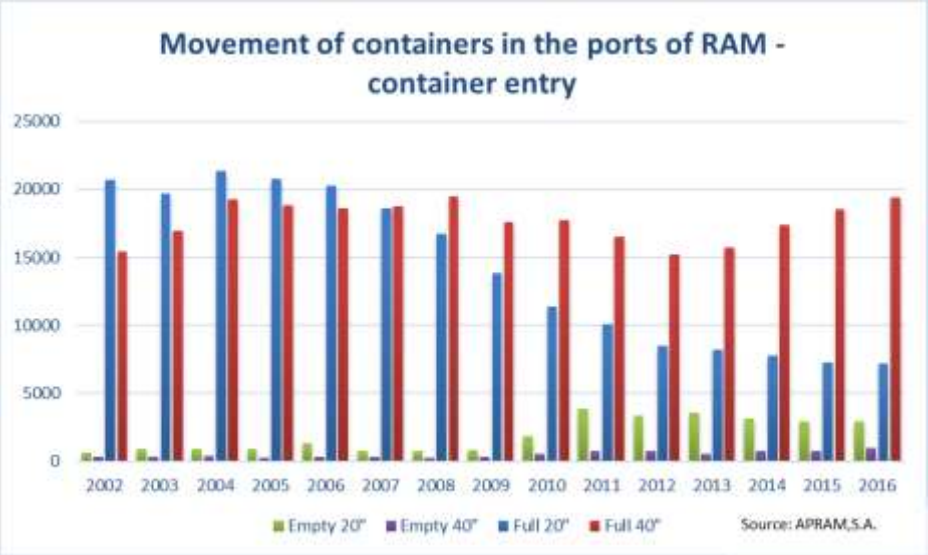
Currently, the port of Caniçal accounts for 87% of the region's merchandise traffic (fuels included), followed by the Socorridos terminal (cement and fuels until January 2015) with 10.5%, the port of Porto Santo with 2, 2% and the port of Funchal has a share of 0.2% (CONSULMAR and Figueira De Sousa, 2016).

In 2016 containerized cargo accounted for 60% of the total cargo handled. The solid bulk was the load that registered a major decrease. Since the inerts are the only cargo that has origin and destination to Madeira, it was decided to separate from solid bulk. The fall in consumption and especially in construction, explain these values (graphic 19).



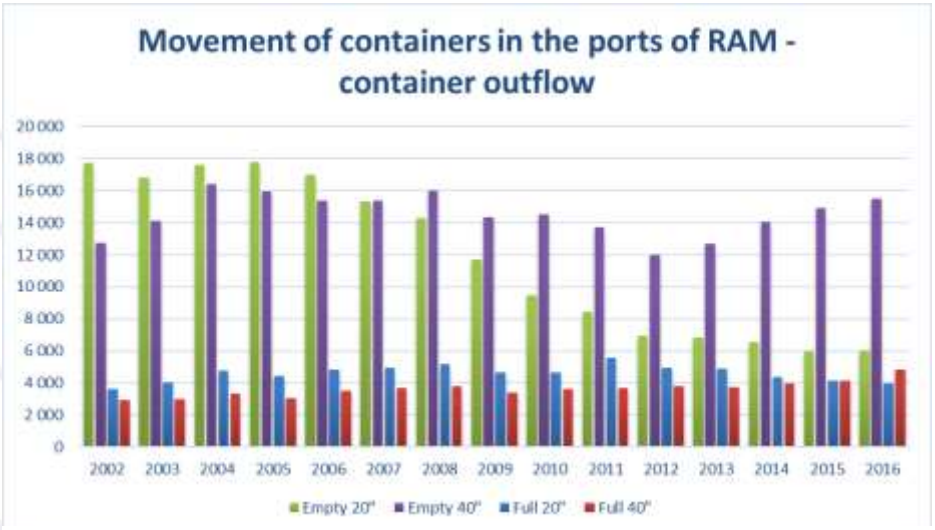
Graphic 19– Evolution of the moved cargo in the ports of the RAM by type of cargo (RAM)
Source: APRAM, S.A.

Regarding the movement of containers in the Region, based on what has been mentioned previously in this analysis, about 87% of containers entering the Region are full and correspond mostly to 40-foot containers (graphic 20).



Graphic 20– Movement of containers in the ports of RAM – container entry
Source: APRAM, S.A.

About 71% of the containers leaving the Region correspond to empty containers, in line with the previous analysis that reveals that the Region is mainly an importing territory (graphic 21).



Graphic 21- Movement of containers in the ports of RAM – container outflow
Source: APRAM, S.A.

The gross registered tonnage in the ports of the Region, in the period of 2002 and 2016, shows a growing trajectory until 2012, with more than 31 thousand tons. In 2013 there was a decrease of 17% compared to the previous year. In 2015 there was a growth of 16% over the previous year. If the vessel movement is analysed by its type, it is possible

to observe that the movement of ships in 2016 represented 54% of the movements in the RAM.

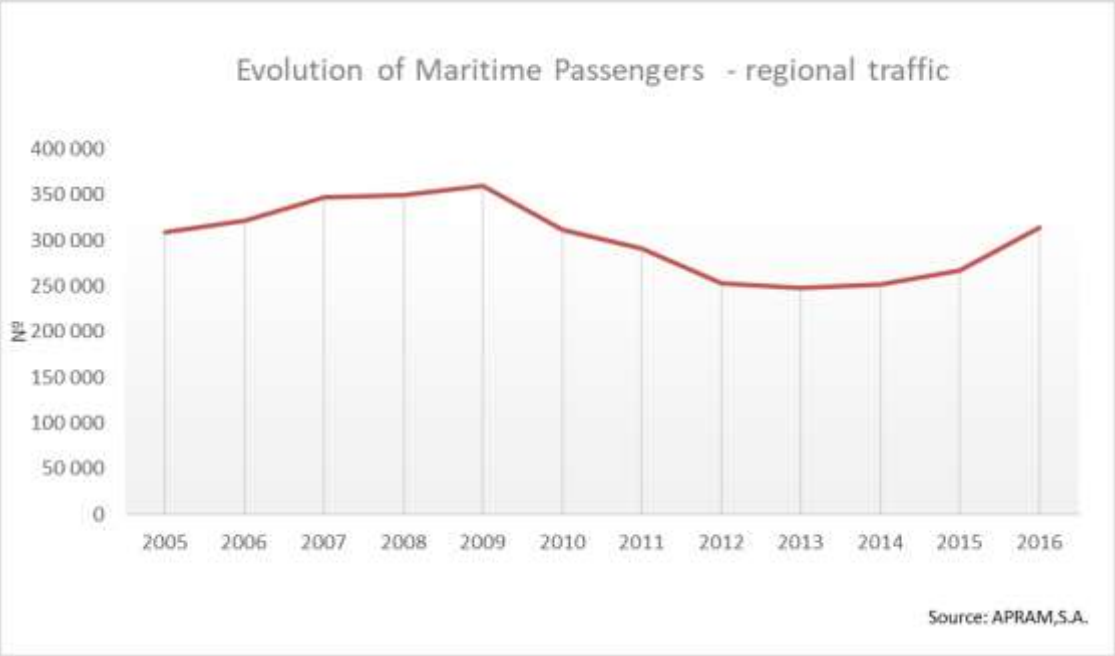
5.3 Transportation of passengers

Passenger, car and inter-shipment traffic is provided by the Ro / Ro Lobo Marinho ferry, belonging to the shipping company Porto Santo Line.

The ferry travels between the port of Funchal and the port of Porto Santo with the frequency of 6 stopovers per week in winter time and 7 weekly stopovers in summer time(Lopes,2016). The ferry has capacity to receive 1 150 passengers, 145 vehicles although this value is not totally accurate, depending on the size of the cargo it transports.

This ferry allows Porto Santo island to receive daily cargo, most of which are transported in vans and trucks, which reduces logistical costs and increases distribution capacity.

The analysis of the evolution of maritime traffic of inter-island passengers allows us to verify that there was a fall between 2009 and 2012, due to the economic crisis. As of 2012, the number of passengers transported remained stable, and in 2015, it was 267,541 passengers (graphic 22).



Graphic 22 – Evolution of maritime passengers – regional traffic
Source: APRAM, S.A.

According to PIETRAM 2014-2020, the Madeira-Porto Santo line is only sustainable with a minimum traffic of 300 thousand passengers per year.

This objective was reached in 2016, due to the efforts made by the Regional Government, in the design of subsidies in support of Madeira Islanders who wish to move between islands during the low season.

6 Future perspectives

For the development of the future perspective, we used the study Mar Madeira Strategic Reference Plan 2030, the Strategic Integrated Transport Plan for the Autonomous Region of Madeira 2014/2020 (PIETRAM) and the Tourism Planning Plan of the Autonomous Region of Madeira were considered.

The strategic vision for the development of the economy of the sea, especially for the activities that are within the blue growth, is formulated, whenever possible, considering the growth forecasts for the sectors, based on these plans.

6.1 Aquaculture

According to the Food and Agriculture Organization (FAO, 2014), aquaculture currently accounts for about half of the supply of fish for human consumption. This is the fastest growing agro-industry in the world with the production of food fish from aquaculture growing at about 6.2% per year in between 2000 and 2012.

Recently in Madeira there has been a great interest in marine aquaculture. There are several new requests for sites under licensing procedures. Considering those new licenses, the total production capacity of the offshore fish farms installed in Madeira is believed to increase to about 4000 tonnes per year by 2018, with a total market value of about 20 million euros, considering the price at farm of 5 euros per kg.

6.2 Biotechnology

In the field of marine biotechnology there is a great need to increase knowledge of Madeira´s marine biological resources. The fishing resources of the archipelago are arguably the best-known living resources due to long term studies and commitments with the national and international management plans for the local species stocks, namely the Regulation (EU) nº1380/2013, from December 11th, 2013.

The Oceanic Observatory of Madeira (OOM) was established in 2015 as a consortium of local institutions dedicated to marine research and technical development, plus private companies from the blue economy (coastal tourism, aquaculture). Despite the scientific output of OOM and link with other scientific centres, its impact and contribution for the development of the Blue Economy will be at long term and presently difficult to determine. Nevertheless, the studies carried out by OOM are of use for most areas of sea economy, such is the case of 1) physical oceanography for the ports, fisheries and aquaculture; 2) impact of climate changes and marine invasions in the coastal economy; 3) deep sea fishing resources for the diversification and sustainability of fisheries; 4) new candidate species and environmental studies for the aquaculture industry; etc.

6.3 Tourism

6.3.1 Coastal and Maritime Tourism

The POTRAM made a projection for the evolution of the number of tourists for organized sea trips, took into account the projected growth in the number of total tourists, pointing to 1.4 to 1.5 million in 2025.

The projection of the evolution of the number of tourists involved in organized sea trips is directly related to the number of tourists who visit the RAM. This ratio was around 10% in 2013. It is assumed that this ratio will remain at 10% by 2020 but that it can grow to 11% by 2030 and reach 12% by 2035, given the apparent growth (table 5).

Table 5 - – Projections of evolution of the number of tourists involved in organized sea trips - tourist maritime activity.

Year	Base scenario	Optimistic scenario
2020	130 822	137 363
2025	152 855	160 498
2035	197 792	207 681

Source: PIETRAM

6.3.2 Recreational boating

The PWC study (2016) define some of the challenges facing the subsector of recreational boating and water sports activities, namely:

- stimulation of nautical tourism through sports such as surfing, windsurfing, kite surfing, water skiing, triathlon, sail charters, scuba diving, motor boating, sailing, rowing and canoeing, amongst others; continue the development of maritime sea activities;
- continued branding of Madeira;
- harnessing the economic potential associated with the vertical development of this industry (end consumers, services providers, producers of all kinds of equipment needed for leisure and sports);
- develop a vision of an industry revitalizing the local and national economy;
- using all the capabilities of this subsector in supporting the development of a maritime culture;
- to develop recreational boating and marinas towards to international scale levels.

6.3.3 Maritime tourism – cruise tourism

The PIETRAM has made a future evolution of the number of cruise ship stopovers in the Port of Funchal, considering the projections of Cruise Market Watch regarding the global growth in the number of cruise ships and passengers embarked in Europe. These projections were weighted with the growth rates of the cruise ship stopovers in the port of Funchal in recent years. The table 6 and 7 presents a summary of the indicators considered.

Table 6 – Cruise market watch projections

Year	Number of active cruise ship	% (ships)	Number of passengers shipped in europe	% (passengers)	Average Annual Growth Rate 2015-2019 (passengers)
2014	282	-			
2015	298	5,7 %	5 762 000		
2016	308	3,4%	5 894 000	2,3%	2,5%
2017	313	1,6%	6 109 000	3,6 %	
2018	-		6 231 000	2,0 %	
2019	-		6 354 000	2,0%	

Source: PIETRAM

Table 7 - – Average Annual Growth Rate of cruise ship scales in port of Funchal.

Period	Average Annual Growth Rate
2000-2004	5,0%
2005-2009	-1,1%
2010-2014	-1,0%
2000-2014	2,0%
2005-2014	0,7%

Source: PIETRAM

According to PIETRAM and taking into account the projections of the Cruise Market Watch, two growth scenarios were adopted for the projections of cruise ship stopovers in the port of Funchal up to the horizon year 2035.

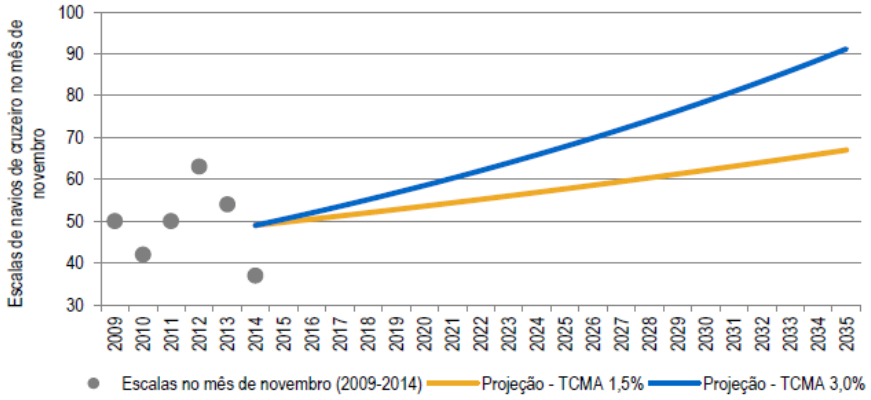
An optimistic scenario with an average annual growth rate of 3 %, and a base scenario with an average annual growth rate of 1.5%. Both scenarios applied to the month of the year with the highest demand - November -, starting from the value.

The projection of the evolution of the scales of cruise ships in the port of Funchal was carried out for November, month that systematically registers the highest demand throughout the year and, therefore, suitable to test the availability of this port to welcome the growth in the number of stopovers of these vessels. In the Optimistic scenario, 91 scales are expected during the month of November of the year horizon 2035 (table 8 and graphic 23).

Table 8 - – Projections of the evolution of the scales of cruise ships in the port of Funchal in the month of greatest demand - November

Year	Base scenario Average annual growth rate = 1,5%	Optimistic scenario Average anual growth rate = 3%
2020	54	59
2025	58	68
2035	67	91

Source: PIETRAM



Graphic 23 - Projections of evolution of the scales of cruise ships in the port of funchal in the month of greatest demand – November
Source: PIETRAM

6.3.4 International ship registry of Madeira (RINM-Mar)

Relatively to the RINM-Mar, the PWC study (2016), define some of the challenges facing this subsector, namely:

- to capitalize on all the benefits that result from attracting companies related to shipping, generated by the international registration of ships, to develop more activities related to the shipping industry in Portugal;
- continuously monitor international trends related to the registration of ships and shipping, in order to always be at the forefront of providing ship registration services.

6.4 Renewable Ocean Energy

In the field of renewable energy, it is necessary to continue to focus on knowledge and application to the RAM, in particular by assessing the impacts of renewable energy and developing a comprehensive study on marine renewable energy technologies. It will also be important to support research into energy storage and energy efficiency.

The RAM holds the conditions for the development of renewable energies in the maritime space. To this end, it will be necessary to deepen technical and scientific knowledge and to develop pilot projects, in particular through participation in programs promoted by the European Commission for innovation and competitiveness in the field of the economy of the sea.

The Sustainable Energy Action Plan (2012) from AREAM, define six strategic lines, which guide the actions for sustainable energy to be implemented in Madeira Island:

- Improve energy conversion and utilization efficiency;
- Increase the contribution of renewable energy resources;
- Diversify energy sources;
- Increase the capacity of energy storage infrastructures;
- Promote energy products and services that promote economic development, regional added value and qualified employment;
- Promote forms of energy with lower carbon content.

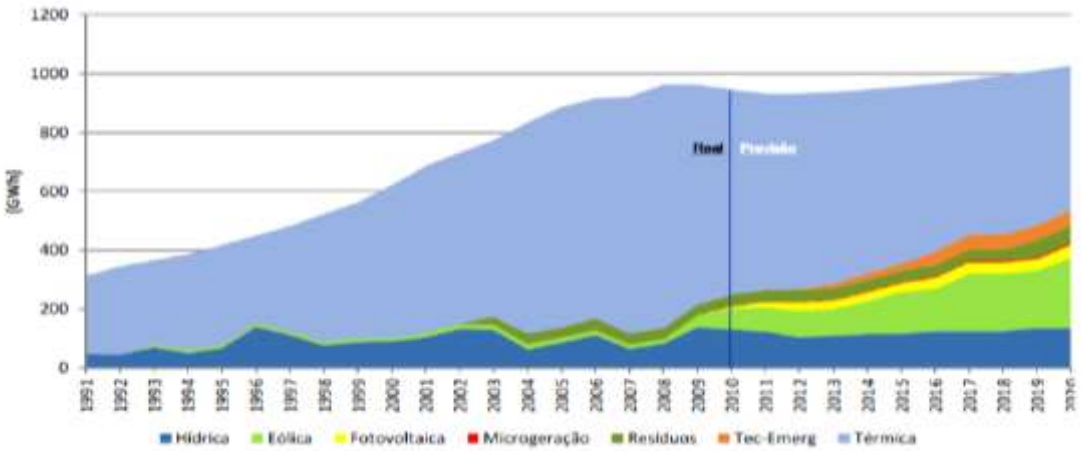
According to the same plan have been defined specific objectives, that aim at sustainable energy production in Madeira and Porto Santo, namely:

- Improve security of energy supply;

- Reduce dependence on the outside;
- Reduce energy intensity in Gross Domestic Product;
- Reduce carbon dioxide emissions.

Improving efficiency in the conversion and use of energy as well as increasing the contribution of renewable energy resources to the demand for primary energy are strategic guidelines common to all objectives and are therefore key drivers of regional policy and actions to be implemented (AREAM, 2012: 9).

The same document presented the forecasts for the evolution of the electric power system by origin until the horizon year of 2020 (graphic 24).



Graphic 24 – Evolution of energy production by source in RAM (1991-2020)
Source: PIETRAM

The increase in production based on renewable sources and microgeneration and the reduction of the production of energy of thermal origin (fuel oil) by around 20% between 2014 and 2020 is relevant. This scenario implies a reduction in the import of fuels.

Under the "Global Climate Leadership Memorandum of Understanding (MOU)" which the RAM signed in 2015, aims to reduce carbon dioxide emissions by 80% to 95% by 2050.

6.5 Fisheries

The PWC study (2016) refer some of challenges facing this subsector, namely:

- adding value to the primary base product (seafood) through its conservation, transformation and diversification;
- strengthening sustainable fishing practices, certifying processes and communicating properly to the final consumer;
- replacement of imports by domestic production to meet the existing demand of the Portuguese market;
- invest in research and development for technologies and processes that minimize the costs associated with the energy needed to power fishing vessels, to cope with rising oil prices and/or decreases in the price of fish in the market;
- strengthening the brand of processed products;
- taking advantage of the potential of aquaculture;
- develop the supply chain of the markets;
- continue to develop safety conditions at sea.

In the "Program of the XII Regional Government of Madeira", which, in the fisheries sector, proposes the permanence of the main fishing port of the Region in Funchal, defining as strategic guidelines:

- The rehabilitation of the Funchal lot and associated buildings, with a vision focused on the new surrounding typology and with tourist presence;
- The investment in the reprofiling of the Port of Caniçal improving the adjustment to loading and unloading of fish;
- The reconstruction of the Porto Moniz lot;
- Establishment of a mobile lot with adequate transportation and fish.

6.6 Port activity

The PWC study (2016) refers some of the challenges facing this subsector, namely:

- development of seaports as a truly integrated logistics platform in international supply chains, maximising the interface between the highways of the sea, road, rail and airports;
- improvement of the technical conditions of ports: depth, operating conditions at the ports, customer service and communication;
- reduction of taxation and bureaucracy associated with using ports;
- rebuilding of a merchant marine corresponding to the Portuguese maritime potential;
- development of every opportunity of coastal shipping between various ports.

The PIETRAM carried out an analysis of the utilization rate for freight transport up to 2020 for the port of Caniçal, as it is the main commercial port of the Region. The utilization rate of 100% of a terminal should be the goal to be achieved and corresponds to the optimal use of this terminal, for which all investments were estimated, both in port infrastructure and equipment. Although the target for each terminal is a 100% utilization rate, this does not invalidate the need to prepare alternative solutions (with adequate advance, not less than 5 years) to cope with subsequent increases in traffic, such as:

- Through the creation of new terminals;
- By expanding existing terminals;
- By transferring traffic to other ports with excess capacity.

For 2020, it is expected that the utilization rate for all the terminals of the Caniçal port will be low, a little more than 50%, ranging from the lowest value of 21.6% in the general cargo factorized, and the highest value of 72.7%, in the containerized cargo, with virtually no use of the Ro-Ro terminal, due to lack of demand, in the current situation and with no better prospect in the next 5 years.

When considering separately the capacity for each of the three major types of cargo (general cargo, liquid bulk and solid bulk), there are no situations near the capacity limit, the most unfavourable case being that of liquid bulk, with a use of 65.8%.

However, in general cargo, although overall the port has a capacity that assures a low utilization rate, close to 50%, in the case of containerized cargo the rate rises to close to 73% (which can be considered a threshold for A process to study capacity expansion solutions will be initiated, both with regard to dock handling and, in particular, the capacity of the park, with a utilization rate of around 90% by 2020);

There are no user charges at the breakage threshold (rates above 85%) at any of the seaports in the port in question.

The same plan carried out an analysis of the utilization rate for the reception of cruise ships for the main port of the Region, the port of Funchal in the month with the highest demand, the month of November. The maximum installed capacity was evaluated at 65 vessels per month, the study concluded that this capacity will be sufficient to meet expected demand for the 2020 horizon, although the usage rate can reach values of 83 to 90% depending on the accepted scenario.

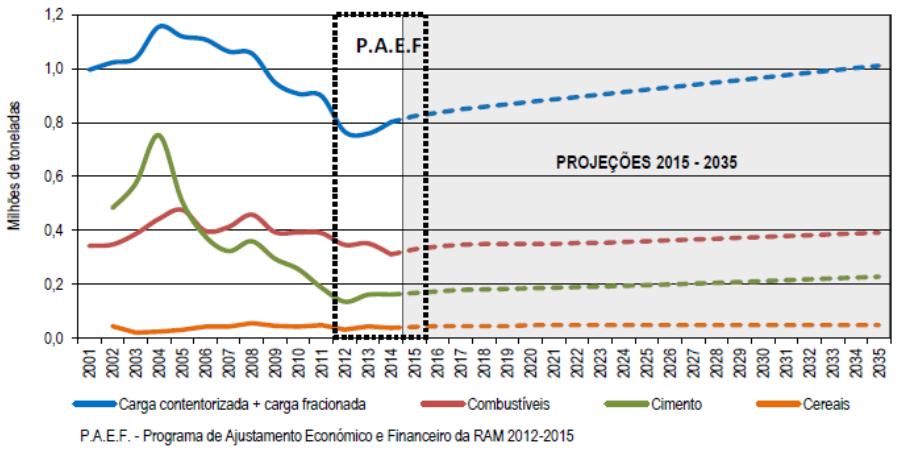
The adoption of the criteria indicated in the definition of the scenario of future evolution of the movement of cargo in the ports of the RAM has led to the results summarized in table 9 and graphic 25 in the annex.

Table 9 - Projections of the evolution of the movement of goods of the RAM

Year	Containerized cargo		Fuels	Cement	Cereals	Total movement*
	Ton.	TEU				
2014	779 943	94 188	310 749	161 850	37 950	1 313 411
2020 P**	833 561	97 144	349 664	184 903	47 554	1 472 265
2025 P	874 455	99 024	359 921	196 832	47 802	1 535 887
2035	956 096	106 233	391 533	228 111	48 232	1 699 804
Average Annual Growth Rate						
2019	0,9%	0,5%	0,9%	1,6%	0,7%	1,1%

*Without extraction of aggregates

**Prevision



Graphic 25 - Projections of the evolution of the movement of goods of the RAM
Source: PIETRAM

6.7 Transportation of passengers

According to PIETRAM, the projection of the future evolution of the number of inter-island passengers transported by sea allows the recovery of the regional economy, with an estimated regional GDP growth of between 1,7 and 2,2% By 2025. This growth will be reflected positively in the number of passengers transported (table 10).

Table 10 – Supported growth rates for regional GDP and transported passengers

Period	GDP by volume		Passengers transported between islands by sea		
	Annual variation				
	Base scenario	Optimistic scenario	Period	Annual variation	
				Base cenario	Optimistic scenario
2014*	0%	0%	**2015**	2%	2%
2015-2025	1,7%	2,2%	**2016-2025**	2,4%	3%
2026-2035	1,4%	1,6%	**2026-2028**	1,5%	1,8%
-			**2029-2035**	1%	1,2%

Source: PIETRAM

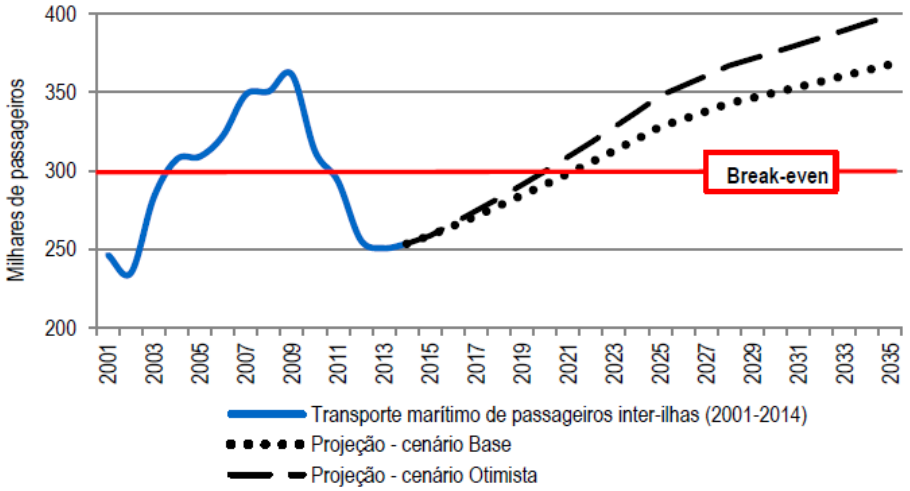
Regarding the movement of goods in the RAM and the scale of cruise ships in the Port of Funchal, the objective of the projections is to test the availability of port infrastructures to accommodate future demand in a scenario of moderate growth of the regional economy. For maritime transport of inter-island passengers, the projections are a prospective exercise to understand under what conditions the recovery of the number of passengers transported can be achieved.

Based on the assumptions for the future evolution of inter-island passenger transportation by sea, it is estimated that the break-even, with the current tariffs, will be reached in 2020 for the Optimistic scenario or in 2022 for the Base scenario (table 11 and graphic 26).

Table 11 – Projections for the evolution of the number of inter-island passengers transported by sea

Year	Base scenario	Optimistic scenario
	Average anual growth rate 2014-2035 = 1,8%	Average anual growth rate 2014-2035 =2,2%
2020	291 393	300 030
2025	328 079	347 817
2035	367 812	398 894

Source: PIETRAM



Graphic 26 - Projections for the evolution of the number of inter-island passengers transported by sea
Source: PIETRAM

6.8 Plans/projects

The Strategic Reference Plan Mar Madeira 2030 presented six strategic axes of intervention until 2030, namely:

- Strategic Axis of Intervention 1 - Promote knowledge, innovation and entrepreneurship associated with resources and activities related to the sea.
- Strategic Axis of Intervention 2 - Promote diversification and increase of added value in the exploitation of marine living resources.
- Strategic Axis of Intervention 3 - Reinforce the competitive capacity of the maritime-port sector.
- Strategic Axis of Intervention 4 - Promote the qualification and diversification of the regional tourist supply based on the "sea" resource.
- Strategic Axis of Intervention 5 - To value maritime identity as an asset of the Region and a factor of territorial differentiation.
- Strategic Axis of Intervention 6 - Implementation of a governance model capable of responding to the challenges of the development of the economy of the sea.

These strategic axes are closely related to the blue economy and aim to strengthen the economy of the sea in the Region.

The National Strategy for the Sea 2013-2020 comprises a set of macro-objectives that will be important to apply to the Region in the context of strengthening the marine economy, especially in the context of blue growth.

The following key objectives are highlighted:

- Recover the national maritime identity in a modern, proactive and entrepreneurial framework;
- To realize the economic, geostrategic and geopolitical potential of the maritime territory, making Sea-Portugal an asset with permanent economic, social and environmental benefits;
- Create conditions to attract national and international investment in all sectors of the marine economy, promoting growth, employment, social cohesion and territorial integrity;

- Strengthen national scientific and technological capacity by encouraging the development of new areas of action that promote knowledge of the ocean and effectively, efficiently and sustainably enhance its resources, uses and activities.
- To consecrate Portugal, as a maritime nation, as an integral part of the Integrated Maritime Policy and the Maritime Strategy of the European Union, in particular for the Atlantic area.

In the phase of elaboration of the National Strategy for the Sea 2013-2020, the RAM presented a set of 24 projects that are divided by diversifying programmatic areas.

These are interventions with particular relevance to the strengthening of regional maritime economics.

The Strategy for the sea basins: seas surrounding the outermost regions of Europe, of which the RAM is part. The outermost regions face the following difficulties in terms of harmonious and sustainable development:

- Remote location;
- Insularity;
- Small surface;
- Arduous topography and climate;
- Economic dependence on a small number of products.

Therefore, EU policy is mainly aimed at improving accessibility, increasing competitiveness and strengthening regional integration. However, in an era in which globalization and research are key to improving competitiveness in Europe, the EU must also help to develop the sectors in which these regions have a potential for specialization and strong comparative advantages.

7 Conclusions

The RAM has enormous potential for economic activities within blue growth, especially aquaculture and biotechnology, coastal and maritime tourism and renewable energy.

As far as aquaculture is concerned, it is expected to continue to grow in the coming years. It is stipulated that aquaculture areas will all be occupied in the coming years and that production will triple. Biotechnology in the Region, in the coming years, will be limited to the production of algae to produce iodine and consumption.

Coastal and maritime tourism is what shows the greatest potential in the Region. With the land capacity to be crowded and the tour packages that are being offered, it is stipulated that in the coming years it will continue to grow.

The regional maritime space offers unique characteristics for the development of renewable energies, as is the case of wave energy and offshore wind. Some studies have already been carried out in this sense. At this moment, it is necessary to focus on the development of pilot projects so that it is possible to subsequently move on to commercial production.

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9 Annex

Table 1 - Activities related to the sea in the Autonomous Region of Madeira (2015 and the variation between 2007 and 2014)

Atividades	Empresas			VAR.	Pessoal ao serviço nas empresas (Nº)			VAR.	Volume de negócios (€)			VAR.	VAB (€)			VAR.
	2007	2014	2015	2007/2014	2007	2014	2015	2007/2014	2007	2014	2015	2007/2014	2007	2014	2015	2007/2014
Total RAM	22 248	23 662	24 361	6	85 321	61 385	62 293	-28	6 068 679 931	4 054 854 486	3 897 567 395	-33	1 722 349 432	1 197 274 746	1 172 505 383	-30
Total Atividades do Mar	187	146	136	-22	1230	702	620	-43	112623427	93 187 791	61 595 625	-17	36 994 579	19 472 420	12 638 539	-47
% das atividades do mar no total da RAM	0.8	0.6	0.6	-23	1.4	1.1	1.0	-18	1.9	2.3	1.6	21	2.1	1.6	1.1	-23
Pesca	73	69	68	-5	496	334	361	-33	13060642	11 704 111	11 212 920	-10	-70 861	4 772 741	4 04 699	-
Aquicultura	6	5	5	-17	13	15	14	15	252 744	633 144	690 428	151	2 661 081	141 326	113 544	-95
Preparação e conservação de peixe, crustáceos e moluscos	8	5	6	-38	196	99	s.i.	-49	21 365 311	29 218 137	s.i.	37	4 074 773	2 754 998	s.i.	-32
Comércio por grosso de peixe, crustáceos e moluscos	6	4	4	-33	46	11	s.i.	-76	9 883 966	2 978 139	s.i.	-70	897 625	237 954	s.i.	-73
Comércio a retalho de peixe, crustáceos e moluscos, em estabelecimentos especializados	69	36	29	-48	88	50	40	-43	6 334 864	2 946 088	2 557 706	-53	299 240	422 381	320 819	41
Transporte por água	20	23	19	15	203	193	196	-5	49 935 178	45 708 172	46 272 454	-8	19 474 474	11 143 020	11 851 431	-43

Atividades auxiliares dos transportes por água	4	3	3	-25	187	s.i.	9	-	11 789 622	s.i.	862 117	-	9 658 247	s.i.	352745	-	
Aluguer de meios de transporte marítimo e fluvial	1	1	2	0	1	s.i.	s.i.	-	1 100	15 064 029	s.i.	-	s.i.	9 009 055	s.i.	-	

Table 2 - Other economic and equity indicators of companies according to the CAE REV.3

Atividade económica (CAE Rev. 3)	Período de referência dos dados	Remunerações	Produção	Resultado líquido do período	Variação nos inventários da produção	Rendimentos suplementares	Trabalhos para a própria entidade	Subsídios à exploração	Prestações de serviços	Vendas de mercadorias	Custo das mercadorias vendidas	Custo das matérias consumidas e ativos biológicos	Fornecimentos e serviços externos	Gastos com o pessoal	Outros gastos com o pessoal	Excedente bruto de exploração	Formação bruta de capital fixo	Imposto sobre o rendimento
		10^3€																
Pesca																		
	2015	2 340	11 446	-277	-35	23	21	797	56	4 017	6	3 857	3 292	3 211	871	1 553	1 443	42
	2014	2 558	11 925	124	-35	38	21	967	0	5 008	8	3 586	3 445	3 557	1 000	2 099	857	43
	2013	2 276	11 571	184	-36	20	23	1 047	0	4 514	2	3 549	3 614	3 068	792	2 047	633	48
	2012	2 836	12 708	516	-34	19	22	1 016	18	5 737	1	3 567	3 520	3 843	1 007	2 472	713	74
	2011	2 584	11 307	-10	-32	43	19	919	10	5 454	2	2 995	3 525	3 752	1 168	1 641	3 901	40
	2010	1 777	8 440	1 086	-23	17	15	1 097	13	3 699	18	2 272	2 500	2 503	727	2 047	1 200	155
	2009	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
	2008 ⊥	4 199	11 847	267	2	15	2	304	79	3 936	114	1 312	3 593	5 741	1 542	1 224	605	17
Aquicultura																		
	2015	100	383	-77	-1	4	1	67	243	380	315	120	144	132	33	44	36	7
	2014	139	438	-8	-1	0	1	71	259	202	221	126	168	172	33	35	50	9
	2013	139	406	-87	0	0	0	56	158	1 050	930	101	155	174	34	26	16	3

2012		69	135	-381	-48	0	0	62	28	731	673	35	107	84	15	-34	61	5
2011		29	328	-131	0	1	0	56	9	602	310	110	100	38	9	130	40	0
2010		30	753	-108	0	3	0	91	23	846	118	494	118	37	7	189	272	0
2009		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2008	⊥	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Preparação e conservação de peixes, crustáceos e moluscos																		
2015		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2014		1 097	19 985	760	-228		0	237	176	11 562	9 008	14 835	2 379	1 440	342	1 478		154
2013		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2012		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2011		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2010		2 252	18 503	739	-375		0	666	23	9 889	5 941	11 622	3 014	3 046	794	1 356	75	77
2009		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2008	⊥	2 449	19 957	713	162	⊥	0	1 261	35	10 702	7 238	13 093	2 952	3 412	963	1 617	-944	166
Comércio por grosso de peixe, crustáceos e moluscos																		
2015		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2014		148	372	39	0		0	117	45	2 933	2 610	0	133	178	29	170	1	14
2013		149	273	33	0		0	104	43	2 799	2 574	0	129	179	30	62	1	14
2012		155	262	21	0		0	159	60	2 685	2 489	0	111	184	28	121	38	9
2011		598	1 436	144	0		0	221	57	6 903	5 948	348	329	629	30	334	42	3
2010		598	1 207	-107	0		0	209	72	5 597	4 881	348	340	630	32	82	49	2
2009		598	1 436	-267	0		0	180	70	4 876	6 473	496	421	726	128	-51	-20	-40
2008	⊥	622	1 707	-8	0	⊥	0	160	70	8 597	7 413	352	440	758	136	289	-10	17
Comércio a retalho de peixe, crustáceos e moluscos, em estabelecimentos especializados																		
2015		117	523	115	0		0	1	0	2 558	2 042	0	197	156	39	159	11	12
2014		127	669	185	0		0	0	0	2 946	2 282	0	245	179	51	236	9	11
2013		128	619	129	0		0	1	0	2 837	2 229	0	263	172	45	172	64	12

2012	166	749	173	0		0	1	0	3 275	2 535	0	285	223	57	228	52	16
2011	201	886	223	0		0	1	9	3 778	2 913	1	306	272	71	290	23	12
2010	208	991	189	1		0	12	0	3 398	2 562	71	344	279	71	293	12	8
2009	178	987	272	1		0	1	0	4 406	3 423	1	354	245	67	353	-53	16
2008 ⊥	194	1 010	266	0	⊥	0	1	0	4 809	3 801	0	352	269	76	347	4	20
Transportes por água																	
2015	4 010	46 930	1 304	0		0	47	46 272	0	2	4 352	30 570	5 014	1 004	6 843	695	176
2014	3 864	46 054	1 595	0		0	169	45 708	0	16	6 178	28 335	4 816	952	6 471	-1 663	477
2013	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2012	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2011	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2010	4 045	39 401	4 407	0	1 563	0	572	37 827	1	2	1 256	27 155	4 788	743	6 685	13 903	276
2009	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2008 ⊥	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Atividades auxiliares dos transportes por água																	
2015	94	931	-71	0	0	0	0	862	0	0	3	568	118	24	233	0	13
2014	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2013	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2012	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2011	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2010	116	2 376	54	0	0	0	0	2 069	0	0	0	1 851	144	28	378	64	2
2009	118	1 468	125	0	185	0	0	1 283	0	0	0	873	149	31	442	2	1
2008 ⊥	117	1 583	233	0	29	0	0	1 554	0	0	0	779	145	28	659	30	12
Aluguer de meios de transporte marítimo e fluvial																	
2015	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2014	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2013	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…

2012	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2011	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2010	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2009	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
2008 ⊥	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…