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Assessment of the status, development and diversification of fisheries-dependent communities

Aveiro, Portugal - Case study report

August 2010

GAC – Grupo de Accao Costeira

DGPA – Direccao Geral de Pesca e Aquicultura

PENP – Plano Estratégico Nacional para a Pesca - 2007-2013

Section 1) Introduction

1.1 General description of the location

Aveiro is located in the northwest of Portugal within the central region of the country which encompasses around 1/3 of the continental coastline (around 275 km). Along this territory there is a vast diversity of habitats, including the St. Jacinto dune complex and the flooded area around Aveiro. Parts of the flooded area have been classified as special protection zones for migratory birds. Further south there are other important nature reserves, including some RAMSAR sites. The touristic potential of these areas is currently underexploited yet there are plans to further develop this industry.

The city of Aveiro and its fishing port are sheltered from open ocean as they are located inside a large lagoon connected to the Atlantic via an opening at the coast. The fishing industry in Aveiro and surrounding areas represents the region's most important heritage. This economic sector has been extremely important in the development of the whole region, with fishing activity records dating back many years. More recently, following the advances in technology and knowledge into the biology of several important commercial fish species, aquaculture has also become a relevant industry.

The fisheries sector in Aveiro is important at a national level as the city harbours one of the country's busiest fishing ports. Around 6% of total continental fish landings take place in the port of Aveiro. Most of the landings are made by Portuguese vessels yet there are some occasional landings by foreign boats. Small pelagics are the predominant landed species with horse mackerel and sardine representing the largest volumes in terms of weight. Currently the fishing fleet registered in Aveiro comprises of 18 offshore fishing vessels, 38 for coastal fisheries and 851 small scale fishing boats.

There is a large concentration of fishing processing units in the region; at present there are 35 registered fish processing facilities, most of them for processing cod and a smaller number for processing small pelagics such as sardine and mackerel. Cod is brought in by the locally registered offshore fleet but also by some foreign vessels. Due to the increasing scarcity of fisheries resources worldwide the number of large offshore fishing vessels has decreased in recent years; from 2005 to present 5 vessels have been scrapped or sold to foreign fishing companies.

Aveiro also harbours an important commercial port not only for general cargo but also for oil and gas as there is a large oil refinery in the region. Being such a busy port (fishing and commercial) the ancillary sector is also strong, ranging from shipyards for maintenance and shipbuilding, cold storage, manufacture and maintenance of fishing gear, etc. All these ancillary activities contribute significantly to the local economy.

During the last 10 to 15 years the number of jobs in other sector has increased as there were a large number of companies establishing factories in the region. These factories manufacture products ranging from boilers (e.g. Vulcano), advanced electronics (e.g. Siemens) to car parts (e.g. plastic moulding companies) which are distributed throughout the world.

At present the tourism sector in the region is not fully developed. Concerted efforts by the various municipalities in the region are being expanded in view to harness some of the touristic potential of the Aveiro lagoon. With respect to the development of tourism there have been numerous restrictions mainly due to the fact that the areas around the lagoon are within the Natura 2000 protected network. Municipalities are currently increasing development efforts and taking a new approach by integrating the referred restrictions into the future developments.

In summary, the economy of the region of Aveiro is closely linked to the fisheries sector which provides significant employment opportunities. These opportunities range not only from fishing activities but also from the various related ancillary activities, for instance shipbuilding and vessel maintenance. New opportunities will arise in the future in other economic areas as there are plans for the construction of a large industrial park in the vicinity of the city of Aveiro. The rationale behind these developments is to take advantage of the skilled workforce which receives high quality training from the University of Aveiro as well the availability of less qualified (and cheaper) workforce available in the region. To a certain degree there could be some level of interchangeability of the less qualified staff currently working in the fisheries sector, mainly in the processing units, towards the manufacturing industry.

1.2 Location

Aveiro is the 15th most populated city of the country. It is only 51km away from Porto, the second largest Portuguese city and an important consumer centre, and 220km from the capital, Lisbon. Aveiro is sheltered from the Atlantic Ocean as is located in a flooded estuary as shown in the map (Figure 1). For this reason it is an excellent natural harbour, currently accommodating large fishing and commercial ports as well as several important shipyards. Due to the large extension of the flooded area or lagoon, the aquaculture industry has also been developed throughout the years, more recently benefiting from large investments from multinational companies.

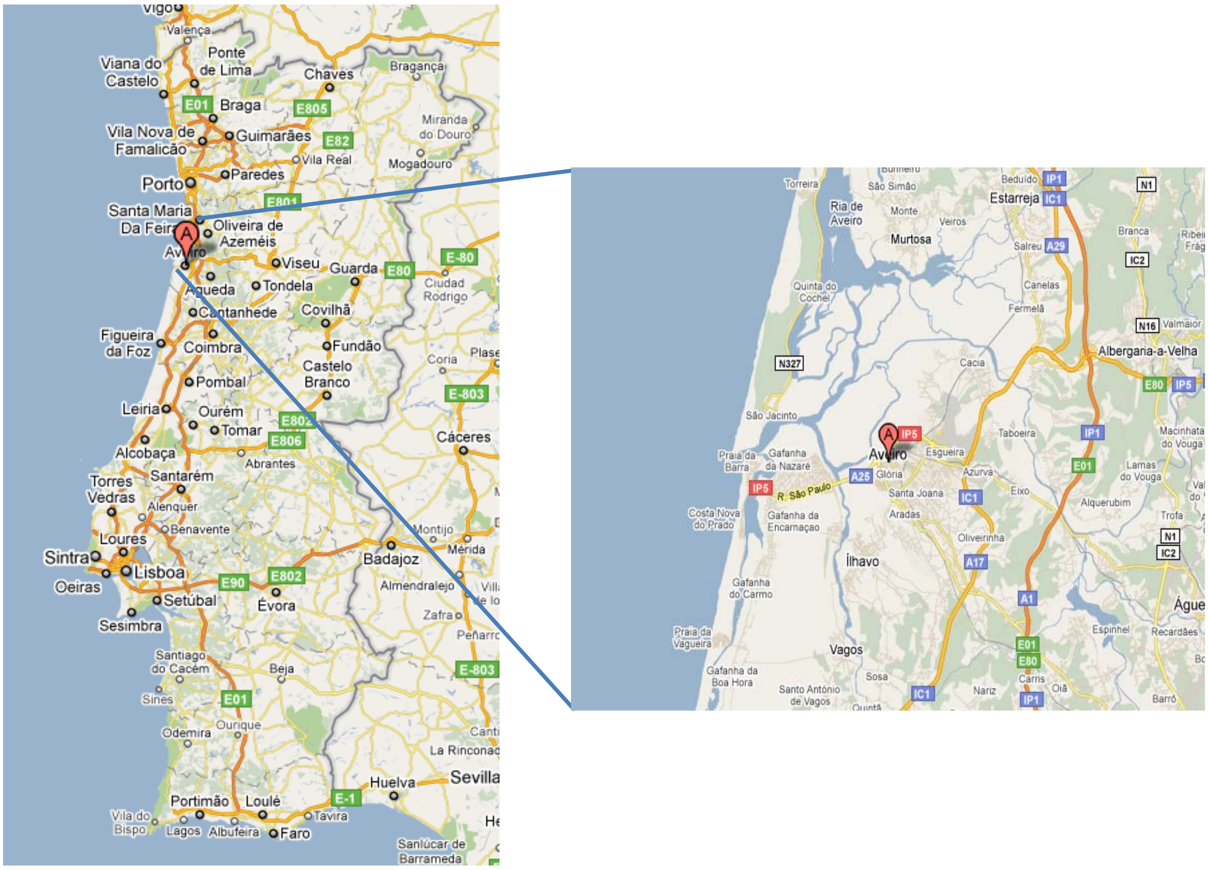


Figure 1 Map of the region of Aveiro.

Aveiro is the main municipality of the Baixo Vouga sub-region (NUTS III) which is integrated within the Portuguese Central Region (NUTS II). Aveiro city is the sub-regional centre as is also the most populated of all municipalities (72.919 inhabitants – INE, 2010). Other sub-regional major cities include Águeda, Ílhavo and Ovar. The sub-region covers an area of 1,807 km² and has a total population of 394,393 inhabitants (2005 census) for an overall density of 218 inhabitants/km². It is crossed from east to west by the Vouga river.

1.3 Key geographical characteristics of the community

As mentioned above, Aveiro greatly benefits from its strategic geographic position (46.65 N; 8.66W) by being located inside a natural harbour or lagoon (referred to "ria" in Portuguese) which has excellent navigation conditions as well as being fully sheltered from exposure to the Atlantic Ocean. Aveiro's temperate climate allows all harbours within the lagoon to be fully operational all year round. Records clearly show that temperature rarely falls below 5°C or exceeds 30°C, as shown in the figure below. Rainfall is also significantly reduced with the exception of the current year as records show rainfall level clearly above the average.

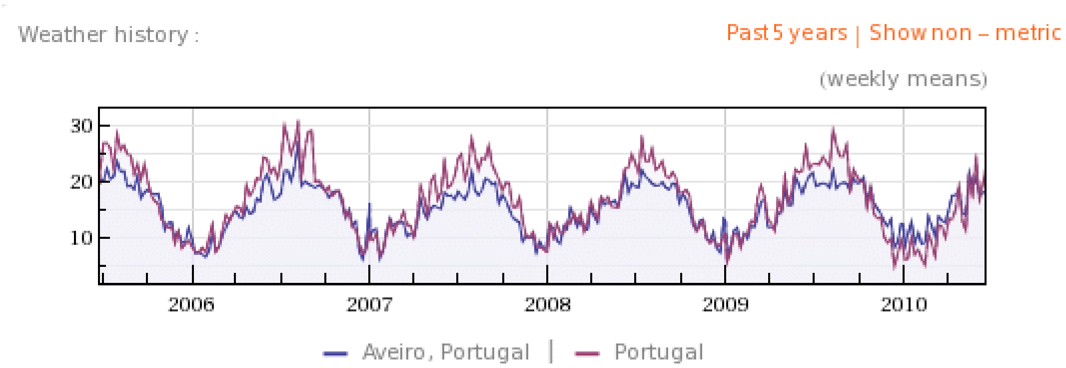


Figure 2 Average temperature (C) records for Aveiro for the last 5 years (Wolfram, 2010).

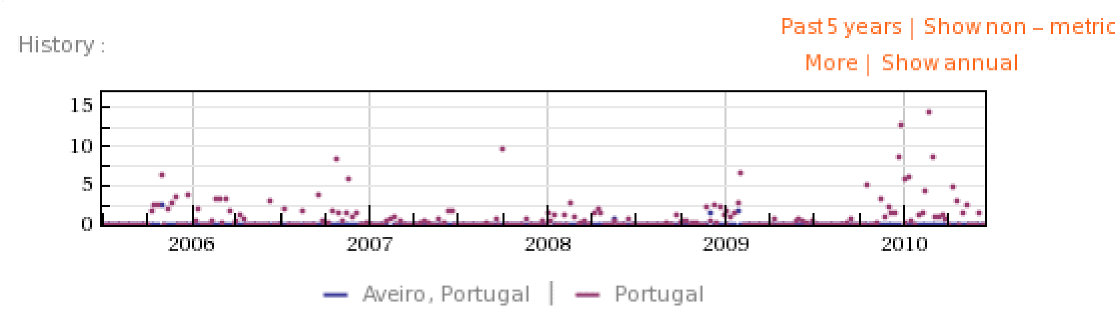


Figure 3 Average rainfall (cm) records for Aveiro for the last 5 years (Wolfram, 2010).

Alongside with the commercial ports and shipyards there are also a few small marinas which harbour privately owned recreational boats. The recreational boat sector is also important in this region as many small businesses depend upon it.

The population of Aveiro has strong links with the lagoon as it has always been part of the city and for some people even part of the everyday life for many years. Aveiro has grown around the fishing sector yet its influence has been decreasing not also as a result in the reduction of the fishing activities but also due to the settlement of a greater number of urban populations coming from neighbouring municipalities.

The bulk of the fishing activity originates from marine catches. Freshwater fisheries have relatively little overall importance. Other maritime activities which were very important up until 30 years ago no longer have a significant economic expression, an example of which is the collection of seaweed within the lagoon that was carried out by boats called “moliceiros”.

Associated with the disappearance of this activity there was also the disappearance of the much of the skilled workforce who constructed the boats used in this activity. The craftsmanship has, however, not been totally lost due to some governmental incentives and financial support provided to boat carpenters who are still able to design and build these traditional boats, and most importantly able to transmit this information onto younger generations. The newly built boats are used exclusively for tourism purposes and heritage events organized by the municipalities.

The harbour and surround areas are well connected to major roads and with direct links from the port to the motorway. The port has also excellent links with the national railway network.

Section 2) Demographic aspects

2.1 Population and population age structure

The total population in the municipality of Aveiro has been steadily decreasing since 2006. This has to be attributed to the combined effects of reduced births rates in the region and immigration to larger cities. It is however, worth noting that this trend does not reflect the current evolution of the population at a national level which shows a steady increase, although at a slower rate in the last 2 years.

It is assumed that the share of the population that works in fisheries sector has remained in the region as their professional skills are not easily interchangeable between industry sectors, with particular emphasis on the fishermen themselves. There is however a certain level of transferability between the people working in the processing sector and industries that require less qualified workforce.

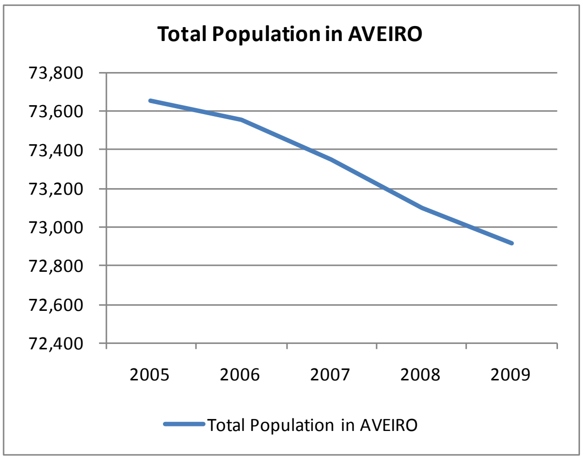


Figure 4 Total population in Aveiro from 2005 to 2009 (INE, 2009).

There is an equal decline in both men and women in the municipality of Aveiro. In terms of the age structure of the population of Aveiro no major changes have occurred in the past 5 years (Figure 7).

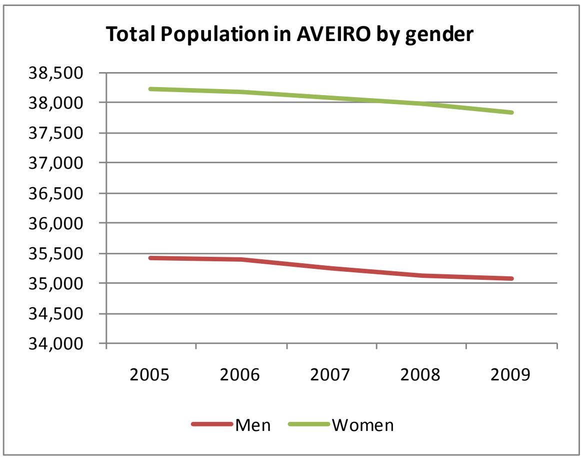


Figure 5 Total population in Aveiro by gender from 2005 to 2009 (INE, 2009).

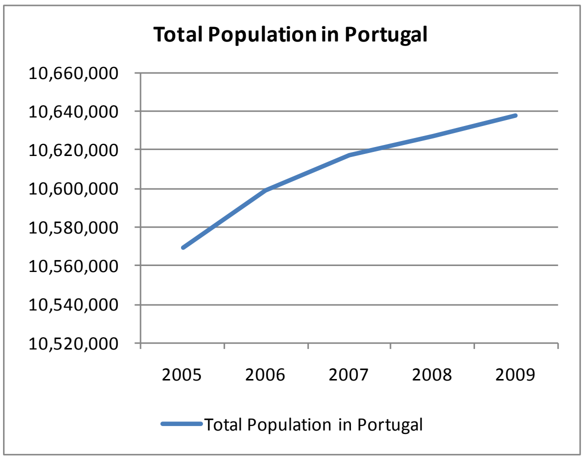


Figure 6 Total population in Portugal from 2005 to 2009 (INE, 2009).

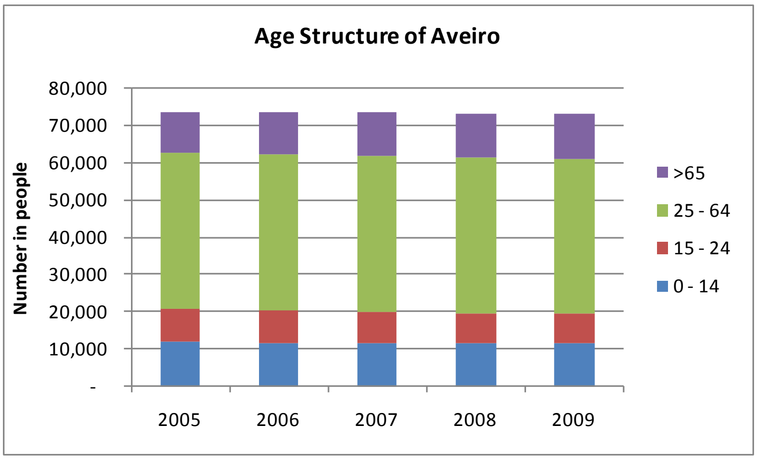


Figure 7 Age-structure of the population of Aveiro, 2005 to 2009 (INE, 2010).

2.2 Ethnicity and migration

There is little historical emigration into Aveiro. However, in recent years emigrants from Eastern European countries and Brazil have settled in the region particularly in the city of Aveiro. In general, emigrants from Brazil possess little or no specific professional qualifications whereas emigrants from Eastern Europe are generally more qualified. The emigrant workforce rarely works in the fisheries industry and only a small number end up working in the maritime sector (mostly in shipyards or in the commercial port), some end up working in fish processing units yet there are no accurate estimates as to the exact numbers.

The ethnic composition of the community resembles that of the nation. The average age of the population has not increased significantly and there are no differences from the national average.

In terms of immigration Aveiro has witnessed the displacement of people to greater cities such as Porto or Lisbon in pursuit of work. Despite the fisheries sector still employing many workers, the overall reduction in fisheries-related industrial activities observed in the last two decades has undoubtedly contributed to driving many people towards big cities in search for other alternatives. It is worth noting, however, that in the more recent years there has been a significant increase in the investment in the aquaculture industry which will in effect lead to the creation of new jobs. Whether this factor will *per se* contribute to reverse the trend in the immigration flow is still to be confirmed as these investments have not yet reach their full output or business potential. It is possible that artisanal fishermen whom no longer desire to go out at sea may join these aquaculture operations to collaborate in the less technical operational requirements.

Section 3) Economic aspects

Aveiro is within one of the most dynamic regions in central Portugal, having shown an economic growth just over the national average. This growth was fuelled mainly by the company’s increase in productivity.

Despite the good infrastructure network greatly contributing to the competitiveness of the companies based in the region there are still several factors hampering further economic development, namely the generally low qualification and professional skills of the population, the large number of micro and small-size companies coupled with the weak entrepreneurial attitude of managers and employees of these same companies.

There are around 40 small and medium size shipyards and 5 larger shipbuilding companies, namely Estaleiros Navais de Peniche, Estaleiros Navais do Mondego, Estaleiros Navais do Centro de Portugal, Navalfoz and NavalRia. These larger shipyards possess highly qualified workforce capable of dealing with construction of large size boats in steel, aluminium and several composite materials. Navalria was recently acquired by a larger company, Martifer. The company’s main activity is maintenance of large vessels rather than construction. Its facilities include a 100 m long dry dock and a equally large floating dock. Following the acquisition of Navalria by Martifer the company’s strategy has changed slightly and is now based around the following two axis:

1. The promotion of the development of the vessel maintenance business - the company believes it is possible to significantly increase the market quota as it possesses a range of highly qualified services, good infrastructures, equipment and competitive prices relative to the north European countries. Aveiro does have a strong activity of the various fishing fleets and ports through which a large volume of fish passes every day. There is a deep water port for offshore fishing vessels, a special port for landing fish and fish products, a smaller port for coastal and local fisheries vessels. In light of this, it is feasible for Navalria to significantly increase it

annual turnover. Currently 60% of its revenue already originates from the fishing fleet.
2. The development of the wave energy equipment. The company will be responsible for the construction of the first large scale equipment.

To enforce this strategy Navalria will make a significant investment in modernizing its facilities in order to improve the comapany's overall productivity. The strategy also involves obtaining quality certification as well as which will also include health, safety and environmental issues. In terms of human resources the company has made public the plans to increase its workforce and carry out training courses for the current staff.

3.1 Importance of economic activities

Fisheries and agriculture are two important sectors in the region (both still having a great socio-cultural importance and often providing the main income to many families) yet secondary and tertiary economic activities have become very important and are now the main contributors to the local economy. This follows the trend observed in the country throughout the last 2 decades.

The current active population in Aveiro nears 38,000 people, 2% of which are employed in the primary sector, 35% in the secondary sector and the remaining 63% employed in the tertiary or services sector (INE – 2001 – census).

This in effect means that only a small share of the population is employed in the primary sector in Aveiro, however, if neighbouring municipalities are taken into account, this percentage would be considerably higher as some of them employ as much as 20% of the population in this sector alone. The same is true with respect to the secondary sector, i.e. if neighbouring municipalities are considered the percentage increases as many of the fish processing units are located there.

In terms of the share of the population employed in the tertiary sector, Aveiro clearly dominates with 63%. The reason for this is because the majority of the services companies in the region tend to have their base in Aveiro city centre. In neighbouring municipalities this percentage is subsequently lower.

From all the companies registered in Aveiro only around 1% are fishing companies. Processing industries account for approximately 10% of that universe of companies. It is in Aveiro that the majority of the real estate and services companies are located; 17.2% of all registered companies in the region are located there.

The processing industry is by far the single greatest employer absorbing nearly 34% of the active population in Aveiro alone. General trade and commerce comes second with around 26%. All other sectors account for the remaining employment and none of them responsible for more than 10% employment each.

3.2 Employment and unemployment

In terms of unemployment Aveiro has in the past shown rates lower than the national average. However, the latest figures indicate a very high unemployment rate nearing 33% for the whole district. This has mostly been the result of the latest global economic downturn.

It is necessary to account for recent changes in the economic conjuncture and transformations to truly appreciate this trend and analyze it within a national framework.

Table 1 Trends in the fisheries sector, 1990 to 2003 (INE, 2006)

PT - National employment in the fisheries sector 1990 – 2005					
Year	1990	1996	2003	2005	Change/yr 96-03
Fishing	40,600	32,178	20,457	21,000	-6.5%
Fish processing	12,200	6,475	6,300	6,251	-0.4%
Aquaculture	6,400	6,400	6,462	6.493	0.2%
Total	59,200	45,053	33,229	33,743	-4.3%

Table 2 Fisheries dependence (INE, 2006).

PT NUTS II	Total fisheries sector		Fishing	
	Employment	Dependence	Employment	Dependence
North – PT11	7,892	0.4%	5,860	0.3%
Center – PT16 **(Aveiro**	5,479	0.4%	4,002	0.3%
Lisbon – PT17	2,835	0.2%	2,106	0.2%
Alentejo – PT18	1,692	0.5%	713	0.2%
Algarve – PT15	9,754	5.1%	3,585	1.9%
Azores – PT20	4,584	4.5%	3,487	3.5%
Madeira – PT30	992	0.9%		

Table 3 National earnings (gross annual income in euros, 2003).

	Earnings (eur/yr)	Index	Sex ratio F/M
National average	13,418	100	n.a
Fisheries total - wages	8,405 (male) 7,999 (female)	62 (60)	34 -
Fishing	7,100	53	n.a.

The average age of people employed in the fisheries sector is the same as the national average age of the active population and is estimated at 42.

3.3 Infrastructure

Accessibilities to Aveiro are particularly good as the city is directly connected to the national motorway grid. As mentioned above, it is possible to be in the second largest Portuguese city, Oporto, in a matter of minutes by car. Accesses to other parts of the country including the inland regions are also good.

Given the close link of Aveiro to the maritime sector, there are major port facilities to deal with both the fishing and the shipbuilding industry. The commercial activities in port of Aveiro have grown considerably during the last decade. Maritime traffic has increased substantially, at a rate of 4.1% year-on-year which corresponds to 5 times the average growth of all other national ports combined. There has also been a great diversification of the range of products that are both landed and expedited from the port.

Aveiro is the most important port in terms of movement of steel products, liquid loads and mix cargo containers. Capabilities to deal with container loads will soon be further developed together with the logistics platform which links Portugal with the rest of Europe via the road and train networks. With respect to liquid loads, an increase is also expected as a result of the installation of BP and AVIA oil terminals as well as the plans for the production of biodiesel.

In terms of education, the local infrastructure includes the University of Aveiro which feeds highly qualified people into work market at a national level. Besides the university, local high schools and high-schools are very well regarded and grouped as the best in the country.

With particular relevance in terms of university degrees, technology is possibly the strongest area followed by engineering and environment related courses. Several multinational companies have identified the quality of these courses and established collaborative agreements with the university and/or university students. This is the case with NEC, Siemens, etc. Moreover, the university itself is very efficient in incentivizing the creation of new companies as it possesses a development unit for this sole purpose. This department played an important role during the late 90s and the beginning of the current decade, in helping launching many technology related companies. These initiatives have contributed to the creation of many technology-related jobs as well as the creation of a significant number of new business opportunities.

Aveiro has more recently, like many other regions in the country, suffered with the current global economic downturn which impact was first felt in smaller companies, namely the various above mentioned start-ups. This has to a certain extent led to some highly qualified young people to seek new jobs in other major cities, namely Porto then Lisbon.

In terms of fisheries-related infrastructures most of the developments have been carried out in neighbouring municipalities, namely as Ilhavo and Gafanha da Nazare.

Aveiro has invested in the local tourism infrastructure and during the site visit it was possible to observe part of this investment which includes the restoration of old factory facilities and other emblematic local infrastructures. Moreover, it was observed that these infrastructures were being visited by groups of tourists.

3.4 Local development plans

During the consultation meetings it was possible to have an insight into what, in general terms, is the strategy for the economic development for the Aveiro region. Following on to the meetings at the head quarter of the GAC (Coastal Actions Group) is clear that the fisheries sector is still a very important for the whole region yet there are no clear plans for it to develop much further. In terms of infrastructures the fishing port already possesses all the right necessary facilities which are in fact built to cope with much larger volumes of fish products than that currently traded through these facilities.

There are several factors hampering the sector's further development, namely the decrease in the abundance of many of the main commercial species along the Portuguese coast as well as a dwindling fleet. There are increasingly less people interested in joining the activity as the financial rewards have been decreasing year on year. In addition to this there are also less people available to work in the fishing boats.

Fisheries are seen by the younger generations as a non-attractive economic activity which involves a great deal of hardship for often very small financial rewards. This fact results in only people with very little qualifications joining the fishing crews; often, as a last resort as they are unable to find any other type of job (it is frequent to find young people that were or still are addicted to drugs in the crews of many fishing vessels). This represents a real restraint to the development of the activity as these people are often unreliable and easily quit once they are given any other work opportunity even if that implies earning less money at the end of the month.

The processing industry is as referred above still the single most important employer in the region as a whole yet this industry in mainly focused on the processing of the cod and cod products. There are no major plans for further growth of this industry too. It is however important to note that there have been some plans to diversify the production yet most of these plans have not yet been implemented or pushed forward by the majority of the companies.

A great deal of attention has however been devoted to the recreational sector and the recreational use to the flooded are as well as the coastal waters. This includes not only the development of recreational navigation but also recreational fishing. It has been noticed that this sector has developed significantly in recent times. There is nonetheless little information into this activity with respect to number of boats and revenue generated by this activity.

To accommodate the recreational fleet there is a project which is denominated the “Marina da Barra” which will have the capacity to harbour 500 boats. This marina has not yet been developed due to the fact that there are some environmental restraints as part of the area where the building would be carried out is within a special protection zone and is part of the natura 2000 network. All the land where this would be developed is publically owned, belonging to the municipality. There project is still under evaluation by the various agencies which will have an important say as to the whether or not it can be approved and carried out.

The municipality has a great interest in pushing this project forward as it would represent an important additional revenue to the municipality as well as developing a new dynamic in the region. At present there is no space or incentives for the recreational boats that travel from northern Europe to the Mediterranean to stop by in Aveiro. Therefore the region is missing an interesting opportunity to increase its revenue from the tourism industry. Aveiro does have a touristic infrastructure capable of coping with the additional tourist originating from the recreational fleets, both national and foreign. Aveiro does also have some interesting tourist attractions which can be exploited and constitute an important asset for the region. There are museums, old converted factory buildings, navigable channels and an interesting architecture in the centre of the town.

A group of fishing companies have made a large investment in the restoration of an old cod fishing vessel which has been converted for touristic purposes.

In terms of investment there are no plans for any new fisheries-related infrastructures. Equally, there are no plans to increase the fish processing capacity in the region. There are however, major developments in the aquaculture infrastructure as Pescanova, has developed a large production unit south of Aveiro. It is believed that the majority of the production will be traded as fresh product and therefore little processing capacity are addition of value will be developed. Nonetheless, this development will surely contributed to a significant increase fisheries-related employment in the region.

At present there are some planned investments in other non-fisheries related industries, especially in the automotive industry, namely in the supply of car parts. It is important to focus that this industry is thought to grow significantly as these new investments' main focus are the green industries. With special emphasis on the production of batteries for hybrid powered cars. This industry in particular has grown extensively in the last 4 years.

In concert with the development of the companies that provide parts for the car industry the municipality and other investment-related regional bodies, have incentivised the creation of research parks within the industrial estates. The main objective of the creation of these R&D centres is the immediate integration of the output of these units into the chain of production. There are also significant synergies between the research departments of the University of Aveiro and the private sector. The university is a net supplier of highly qualified workforce to many multi-national companies located in the region.

Of great relevance are the telecommunication and electronics companies which have offices in Aveiro. Examples of this are companies like Siemens, NEC, Portugal Telecom, Novaria Communications Development Centre amongst other. Another important industrial sector is the production of ceramic pavements, there are large ceramics companies which produce not only for the internal market but also aiming for exports. Alongside this industry there is also the paper and paper pulp industry which employs a large number of people and is an important contributor for the local economy. There are other industries which are labour intensive and require qualified workforce, namely a factory of kitchen appliances (TEKA) which also have an important role in terms of net contribution to both local and national economy as they aim for exports. Other types of industries have also been developing especially the manufacture of construction materials such as pipelines, steel works etc.

The current priorities for the investment in the region are the following key sectors:

- Heavy industry
- Paper pulp
- Ceramics
- Boilers
- Fisheries (maintenance of the existing infrastructure and development of the aquaculture industry; some companies have shown interest in converting the salt ponds for use in aquaculture. The municipality has in the past incentivized the maintenance of the salt ponds yet salt production is no longer competitive especially when comparing to the south of the country where the salt ponds yield a much greater production with significantly lower production costs.)

In terms of urbanization the municipality plans to carry out a significant number of investments in leisure facilities which should help boosting the tourism industry. some of these structures are expected to be completed by 2015. The rationale behind the expansion of this industry is based on two main factors. Firstly it is still considerably underdeveloped, given the large potential in terms of natural and cultural heritage, and secondly there is a growing demand from the internal market. The tourism in the region represents only 12.56% of the GVA generated by the sector at national level.

In terms of current demand for accommodation in the central region, occupancy in B&Bs and hotels was estimated at 131 per 100 inhabitants (71% nationals and 29% foreigners) whereas the estimated national average was estimated at 276 (59% nationals and 41% foreigners; INE, 2009). The demand in the central region was however greatest in the areas south of Aveiro where the offer of sun and sea is wider and of better quality. 90% of the seasonal touristic flow into the county originates from people seeking this kind of product, i.e. sea and sun. in more recent years there is an all year round flow of high quality tourism in search of golfing holidays. The vast majority of these tourists choose the south of the country has it possesses a large number of golf resorts as well as a mild climate during the cold winters in northern European countries.

The overall occupancy rate in the Aveiro region was estimated at 21% per year with guests usually staying an average of 2 days. This confirms the nature of the travelling to Aveiro as being mostly business. During the stay in Aveiro, however, the consultant had the chance to speak to some of the tour operators who started running boat tours in the Ria and they said that the business was growing year-on-year. The consultant had the chance to observe the success of these ventures as there were in fact many people queuing for this service. In summary it seems that Aveiro has now substantially increased the investment for attracting tourists into the city.

Section 4) Fisheries and aquaculture sector

The fisheries sector in the central region of Portugal, particularly in Aveiro, has a high relative social and economic importance at a national level despite representing a small overall contribution to the national economy. For the central region alone it represents 0.5% of its GVA and 25% of the GVA of the fisheries sector at a national level.

In terms of employment, fisheries are responsible for 28% of the employment in the primary sector and 23% of the total number of fishermen registered in the continent, corresponding to approximately 2775 fishermen and ship owners. From the fishermen who reside in the region 89% have basic education, 8% possess secondary education and only 3% have higher qualifications.

In the whole region, bottom trawling is the most important fleet segment. In fact 98% of all fishermen working in this segment at a national level are registered in the central region. Purse seining is also a very relevant segment at a regional level. In the central regional alone there are 222 registered fishermen who represent 66% of the total number of fishermen registered in this segment at a national level.

With respect to the social importance of the fisheries sector it is important to mention that the EU scrapping schemes have contributed to a substantial increase of unemployment. From 1992 to 2000 there was a decrease of 58% in the number of fishermen. From 2004 to 2006 a further decrease was observed and the number of fishermen was reduced further by 16.4%.

In 2006 there were 2080 vessels registered at the national fisheries directorate DGPA, representing 28% of the national fleet in terms of number yet it comes first in terms of power and GT as it includes large vessels (>40m) which operate in the high seas. It is in Ilhavo, Aveiro’s neighbouring municipality that 92% of the high seas fishing vessels (26) are registered. 14 of these vessels prepare, freeze and pack the fish caught in the North Atlantic and the remaining 12 operate in the Southern Atlantic.

These large vessels provide raw material for the 36 fish processing units which operation is very dynamic in terms of incorporating new technologies and adapting to new mark demands.

4.1 Details of the local fishing fleets

Tables 4 and 5 show the change in fleet from 2005 to 2009.

Table 4 Registered fleet 2005 (DGPA)

Port of registration	Fleet	Size class	Number of vessels	GT	Power (KW)
AVEIRO	Coastal	12 a 14.99m	4	75.07	418
		15 a 23.44m	4	219.54	1166,96
		24 a 39.99m	38	8074.34	20326,14
		9 a 11.99m	3	28.75	208,4
	Total Coastal		49	8397.7	22119.5
	High seas	=>40m	13	23579	25822,31
		24 a 39.99m	9	2889	6311,89
	Total high seas		22	26468	32134,2
	Local	0 a 6.99m	590	369.73	3291,44
		7 a 8.99m	258	319.19	2397,75
		9 a 11.99m	19	81.18	637,02
	Total Local		867	770.1	6326,21
AVEIRO Total			**938**	**35635.8**	**60579.91**

Table 5 Registered fleet 2009 (DGPA)

Port of registration	Fleet	Size class	Number of vessels	GT	Power (KW)
AVEIRO	Coastal	12 a 14.99m	3	48.28	249
		15 a 23.99m	3	195.42	962
		24 a 39.99m	30	6398.34	15338,66
		9 a 11.99m	2	15.34	104
	Total Coastal		38	6657.38	16653.66
	High seas	=> 40m	13	23579	25898,37
		24 a 39.99m	5	1684	4014,89
	Total High seas		18	25263	29913,26
	Local	0 a 6.99m	554	381.21	3609,69
		7 a 8.99m	278	350.83	2745,64
		9 a 11.99m	19	81.18	638,04
	Total local		851	813.22	6993,37
AVEIRO Total			**907**	**32733.6**	**53560.29**

The fleet segment which was greatly renovated was the coastal trawling fleet, especially the crustacean trawlers. As opposed to the extensive renovation in the trawlers, the purse seining fleet, which is the oldest, has not been renovated. This fleet in particular does require a significant overhaul in the near future not only due to security reasons but also to improve the working conditions in order to still attract people to be part of the crew.

The modernization of this fleet is urgently needed as the catch of one of the most important species (sardine) depends upon it. The sardine also constitutes an important raw material used in the fish processing industry in the region.

The polyvalent fishing fleet is the most heterogeneous with boats varying greatly in size from 10 to 24 m and in fishing gear. This results in a great diversity of species being landed by this particular fleet. Due to the heterogeneous nature of the fleet it has been difficult to characterize its behavior with an acceptable level of accuracy. More investigation into this matter is required to ensure they are managed according to the guidelines imposed by the EU and stated in the CFP. Among other ship owners face problems such as the reduction in the vessel's power which reduces the traction of active fishing gear, the reduction in fuel consumption and the requirement for the improvement of the energy efficiency of all vessels.

With respect to the small scale fleet, it is still significantly important segment as there are around 40 local fishing communities which depend upon this activity. In 2006 were issued 3681 licenses in the region for boats smaller than 10m. At a national level small scale fisheries contribute with 13% of the total landings in continental Portugal.

Some efforts have been made to trying to convert of the members of some of these communities to change their fishing operation into a tourism operation, including touristic fishing trips, as a way to benefit from the natural assets of the region.

In terms of landings in the central region, the annual average from 2004-2006 was 41% in quantity (approximately 41,000 t/yr) which represented around 37% in value relative to total landings in continental Portugal. At a regional level, 21% of all landings were observed in Aveiro/Ilhavo, preceded by Peniche and Figueira da Foz and followed only by Nazare.

The landings comprise of (regional level) 86% marine fish species which equate to 43% of total national landings. 13% mollusks, 0.6% crustaceans. Marine fish are still the single most important group of species, in all ports in the region.

Concerning landings by segment for the whole central region for the period 2004-2006, trawling represented in average 44% in quantity and 40% in value (continental Portugal), purse seiners 38% in quantity and 36% in value. The polyvalent fishery represented 23% in quantity and 25% in value.

4.2 Fish stock status

The most important stocks exploited by the fishing fleet in Aveiro are the small pelagics, particularly sardine and horse mackerel. The sardine stock has recently been certified by the Marine Stewardship Council, which indicates that is being exploited in a sustainable fashion. With respect to the horse mackerel, its abundance has fluctuated through time yet its abundance is still high and able to sustain the fishery.

There are many other target species for which stock assessment is not carried out. As a result little is known about its overall abundance. All available data for these particular species are fisheries dependent therefore highly unreliable. In addition to this there is a great level of unreported catches (pers. comm.). An example of one of these species is the sea bass and sea bream. Both species are highly valuable and sellable directly to restaurants. According to information gathered during the field visit there are organized networks of fish traders which role is to introduce unreported fish in the markets. The same is true for species like octopus yet the level of underreporting is more seasonal with the highest levels during the summer when demand is very high in restaurants along the Portuguese coast.

The level of underreporting has been estimated at around 60% for the group of species caught by the local small scale fleet. On the other hand the level of IUU of the coastal fleet, especially that targeting small pelagics is considerably lower or even inexistent. The reason for this is related to the fact that small pelagics are traded in much larger volumes and it is easily sold to the local processing units.

There is currently no indication that there will be a significant change to the status of the stocks of small pelagics. With respect to the other fisheries it is not possible to produce any robust estimates as to the future trends of the various stocks. It is however, possible that the reduction of the size of the small scale fleet may ease the fishing pressure on stocks such as sea bream and sea bass stocks.

4.3 Fisheries infrastructure

The central region of the country is well equipped with fishing ports and support facilities. There are to medium size ports, Aveiro and Figueira da Foz, and two smaller size ports in Nazare and Peniche which are almost exclusively dedicated to fisheries.

The port of Aveiro is well connected to the roads network with direct access to major motorways almost directly from the port. These motorways provide a direct access to the capital Lisbon, to Oporto, the closest large market. This link to the motorway also provides access to the whole of the coastal region. The access to Spain is also very easy given the direct motorway connections to Spanish motorways which connect Vilar Formoso (border city) to Madrid, Salamanca and Valladolid.

In addition to the referred road links, the National Railway (REFER) is also establishing a direct connection from the port to the national network. This is an important link which will allow a direct connection to the Spanish railway network. This will per se contribute to the increase in the variety of the cargo arriving at Aveiro for subsequent transportation to Spain.

These new accesses are particularly important for the development of the short distance maritime transport and the maritime highways.

The areas surrounding the port of Aveiro are not under urbanization pressure therefore the operation of the port can be continuous. As such, there have been recent investments for further expansion of the port which now possesses modern infrastructures and a large area for industrial logistic activities. It is possible to further expand the port as there are 190 ha still available for this sole purpose. In terms of cargo handling the port possesses large plane areas. It has four Ro-Ro terminals, one for bulk liquid cargo and another two for general cargo. The access to the port is limited to the vessels with a maximum draught of 8 m and a total overall length of 140 m. It is true that these conditions limit the potential for a more extended use of the port.

Despite these limitations the port of Aveiro has, over the last 20 years, shown to be very dynamic and able to adapt to new market demands. The result of this adaptability has been demonstrated by the observed growth in traffic as well as in the increasing variety of traded products. During the last 10 years, the port has grown 4.1% annually which is around five times the mean growth observed in all the Portuguese ports combined. One type of cargo which will surely increase in the near future are liquid fuels. BP and AVIA have installed large tanks for the storage of fuels within the ports facilities. With a view on the increasing trade in biofuels, it is thought that the volume traded through Aveiro will also increase.

4.4 Details of the local catching sector

The value of total landings in Aveiro peaked in 2008, reaching a total of just over €16 million. This corresponded to a total weight of approximately 12,000 metric tonnes. In 2009, however, the reported landings came back down to a level similar to the 5 year average of around 9,000 tonnes observed in the period before 2008 (Figure 8) . The average total value of this 5 year period was around €13 million. This indicates that in the last 8 years, with exception for 2008, landings have oscillated around 9,000 t.

From 2005 landings originating from both coastal and local fleets increased significantly, duplicating from 2007 onwards (before that period no segregated data was made available to the consultant). This seems to have been the main reason for the observed increase in total landings and subsequent value. With respect to the landing's market value it is important to note that it increased not only as a result of the increase in landings but also due fact that the first sale price of the species landed by these fleets is generally higher as it includes a greater percentage of high value fresh fish species.

Given that the increase in overall landings occurred mainly as a result of the increase in landings originating from the coastal and local fleets, it is thus assumed that there was no change in the landings originating from the offshore or external fleets.

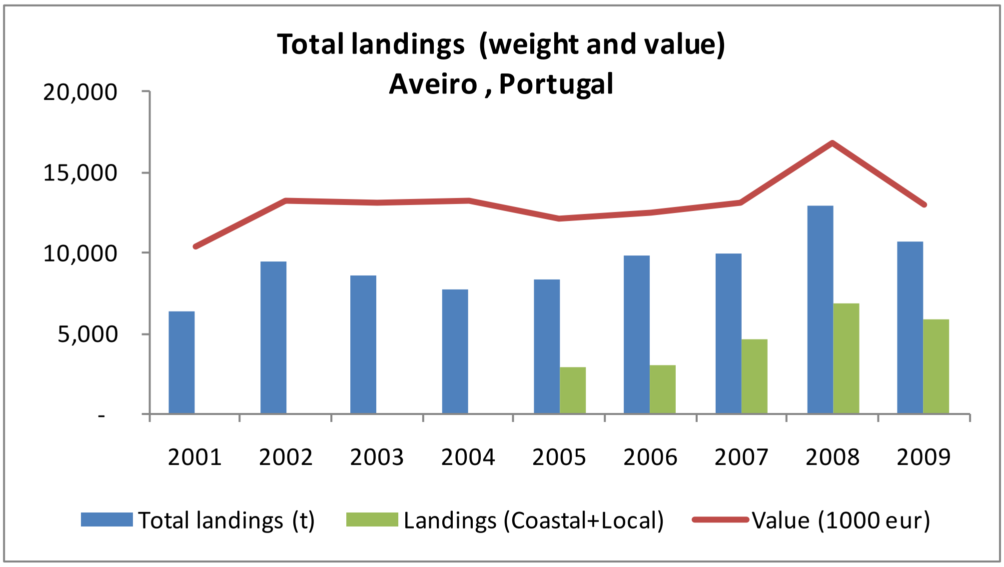


Figure 8 Total landings and landings from coastal and local fleets in Aveiro, and total first sale value of landings (source: DGPA - Lisbon).

Comparing the volume of landings between the two fleets, Figure 9 clearly shows that the largest volume originates from the coastal vessels. Note that the figures include landings from vessels registered in ports other than Aveiro. It is also worth mention that there are many vessels which are operated from Aveiro and owned by companies and operated by crew based in Aveiro which are not registered in this port. The main reason why some ship owners registered their vessels in other ports is because they might have benefitted from subsidies which were attributed to vessels registered elsewhere in less favourable port areas.

In terms of number, the local artisanal fleet comprises roughly of double the number of vessels of the coastal fleet.

Figure 10 lists the species landed in Aveiro by value. Horse mackerel, octopus, squid and sardine are the most valuable landed species by this order. Horse mackerel and sardine are mainly caught by the costal fleet whereas octopus and squid are caught by both fleets.

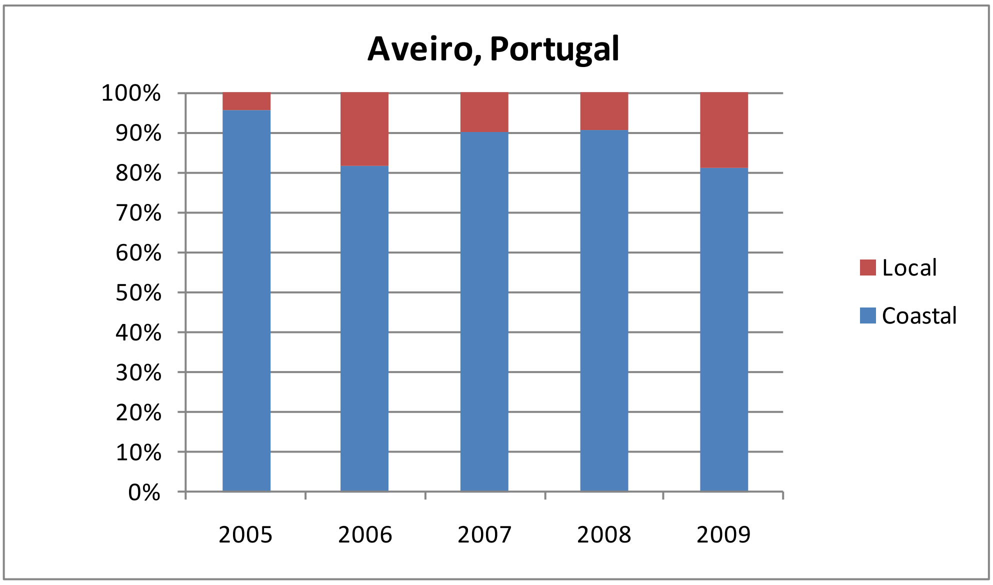


Figure 9 Proportion of landings originating from the coastal and local fleets in Aveiro (information provided by DGPA, Lisbon following our direct contact).

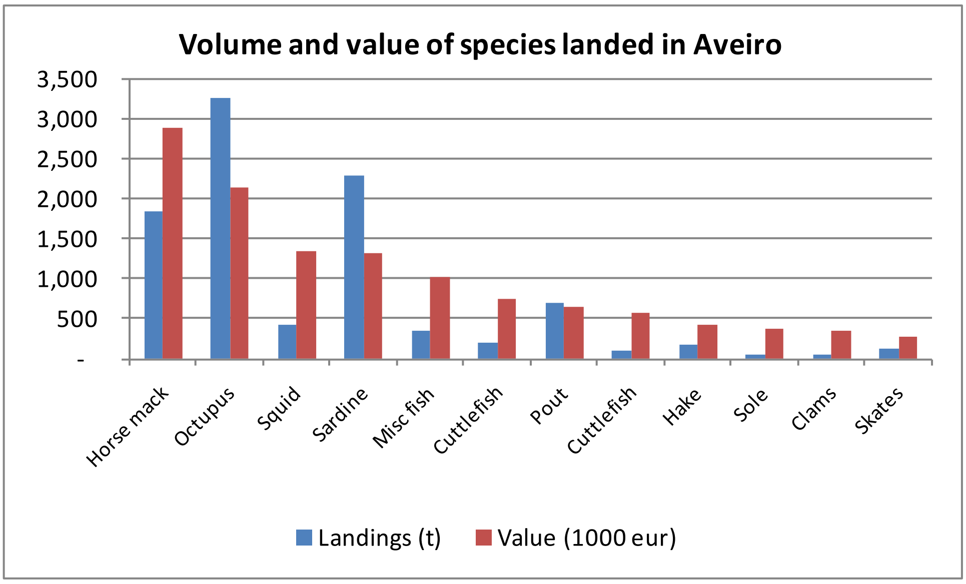


Figure 10 Value and weight of species landed in Aveiro (INE, 2009).

It is difficult to produce an accurate estimate of the profitability of these fleets, in particular of the small scale fleet. The consultant had the opportunity to observe and subsequently confirm with people from the industry that underreporting occurs very frequently, with over 60% of the production landed by the local fleet not being declared.

The local fleet is also the most resilient as it is generally highly adaptable in terms of adjusting the number of staff/crew, type of gear used and interchangeability of target species. The high degree of mobility of the local vessels is also an important factor in the fleet's great adaptation capacity.

The local fleet has also a great advantage of being able to fish within the Ria when the weather does not permit going out to the sea. So it is possible to say that local artisanal fishermen have an extended fishing period when compared to the coastal fleet.

The coastal fleet is less flexible to adaptation. The majority of the vessels currently rely on the fact that crew members are willing to earn small wages and retain a smaller share of the catch. For this reason many vessels employ emigrants from Africa and Eastern Europe who are in general more willing to accept working under these conditions.

Fishing boats do not generally engage with the tourism industry as they are not authorized to take tourists on board either to participate in a fishing operation or to simply enjoy a boat ride within the Ria.

The fleets operate with the normal regional seasonality, winter being the lowest season with limited fishing trips due to adverse weather conditions. In terms of workforce availability, there are generally less people available to work during winter. Availability increases with the improvement of the weather conditions.

The fish landed by the local fleet is sold fresh. There are some institutional buyers who purchase a large proportion of the catch which then is distributed throughout a large number of supermarkets around the country. The remainder of the fresh fish is sold on to smaller local buyers and distributed to restaurants and shops in the region.

The majority of the landings originating from the coastal fleet are sold fresh and the remainder sold frozen. This is usually the case for the less valuable species which are mainly used for processing; an example of such species would be the blue whiting.

In Aveiro there are around 35 fish processing units and the majority are for processing cod (drying and salting). A total of 66 facilities are currently licensed in the region, including all processing and storage. The vast majority of cod processed in Aveiro is distributed throughout the country and some destined for export. These processing units are a good regional source of employment.

Salted cod is valuable commodity due to its high traditional value in the country and around the world amongst Portuguese emigrant communities. Throughout the years, amongst all fishing products, cod has been the target for many publicity and marketing campaigns which actions have intensified with the increasing completion between companies supplying this product. More recently there has been further diversification into the range of products containing cod which results in additional value being added to this fishery. There have been little common industry initiatives, at least those lead by the industry itself.

4.5 Details of the local processing sector

As mentioned above, within the Aveiro region there are 35 fish processing units of which the majority are dedicated to the processing/salting of cod. The output of these units is very significant at a national level. In effect 70% of the national cod salting industry is located in the region.

Within a broader context, the fish processing industry in the central region of Portugal represents 75% of the total number of fish processing companies in the country, 40.3% of the employment, 59% of the total turnover and 46% GVA of the fish processing industry at a national level. 89% of the companies are located in Ilhavo and Aveiro. 33% process cod, 57% process fresh fish and 10% are canning operations.

Between 2002 and 2004 this industry has shown an annual average growth of 5.3% which was above the national average. This has also contributed to an increase in employment of around 10%. The observed growth was, however, due to the implementation of small fresh fish processing units south of Aveiro, namely in Peniche.

4.6 Details of the local aquaculture sector

In the central region of Portugal, there are 35 registered aquaculture production units of which 23 are semi-intensive systems. These units are responsible for 20% of the national production in marine coastal waters. Recently the aquaculture capacity in Aveiro increased substantially as a result of the Pescanova project. The projections for the production of this particular unit point towards a massive increase in the output at a national level. No data was however made available to the consultant both locally or by the central fisheries and aquaculture services.

There is also national investment in aquaculture, an example of this is the company Aquacria which is dedicated to intensive fish production. The company owns a turbot fish farm with an installed capacity of 120 ton/year, which will be expanded to a 350 ton/year farm trough the installation of a hyper-intensive production system, based in Recirculation Aquaculture System Technology, that allows a full control in the main production parameters like water quality, temperature and health resulting in fast growth and high quality product.

The main species produced in the local aquaculture facilities in the lagoon are sea bream, sea bass, turbot followed by a much lower production of oysters, clams and mussels.

Figure 11 shows the location of active aquaculture facilities in the lagoon. Most of the active operations are for fish production. The culture of bivalves has been progressively abandoned throughout the years as it became uneconomical. Nevertheless, bivalves continue to be freely caught by people along the margins of the lagoon. Despite scarce information about this specific activity, the collection of shellfish is thought to play an important socio-economic role in the subsistence of small artisanal fishing communities. Equally the collection of bait (tubeworms) which fetch a high market value, also represents a significant additional income to many families in the region.

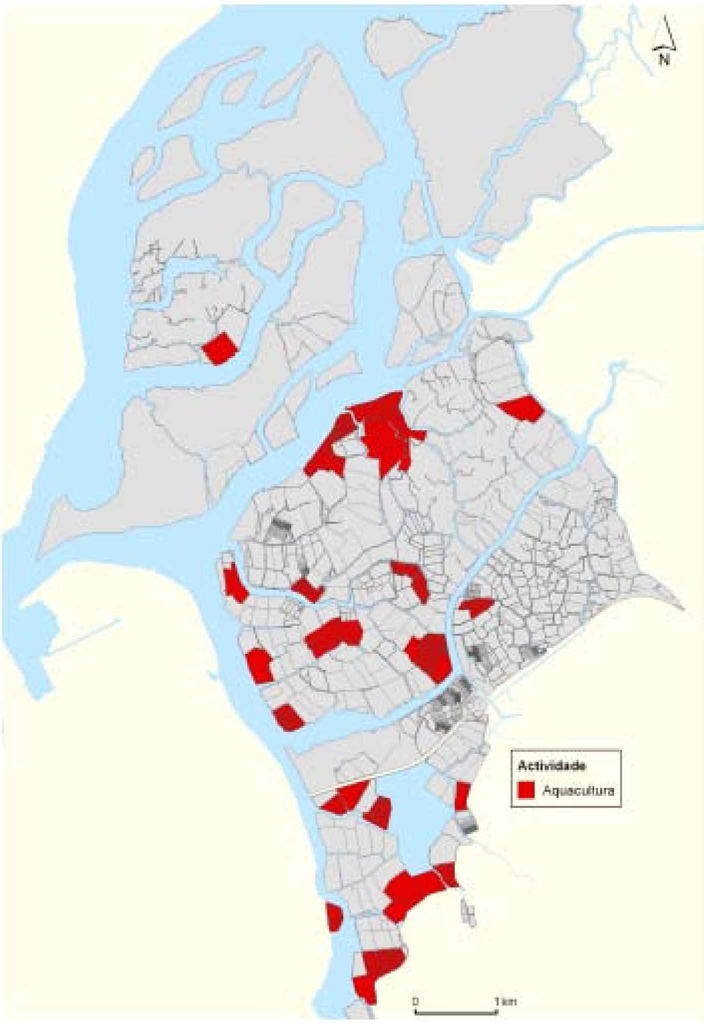


Figure 11 Active aquaculture facilities in the Averio lagoon (MultiAveiro, 2007).

One of the factors significantly hampering further development of the aquaculture industry is the accumulation of silt in the lagoon's channels which ultimately contributing to the siltation of the fish ponds. This is a major concern as it leads to significant additional operational costs, including additional cleaning and aeration which have high energy costs.

In fact this has been recognized as the single most important factor leading to a significant decrease in the number of aquaculture operations in the lagoon. It was estimated that there was a decrease of around 50% from 20 in 1996 to 11 units in 2003.

In more recent years, however, there was a significant investment in this industry by one of the world's leading fisheries companies. Pescanova has made an investment of around EUR350 million in an aquaculture unit for the production of turbot. The implementation of this project has generated around 550 direct jobs. In it maximum capacity the unit will produce an estimated 7,000 metric tonnes of fish, 90% of which is destined for exports. The implementation of this project will result in the duplication of the national aquaculture output.

Another relevant sector is the sea salt production which dates back to the X century. The production of salt has greatly contributed for the economic development of the region and is one of the main reasons why the cod salting units were here implemented. Figure 12 indicates the location of the units currently functioning.

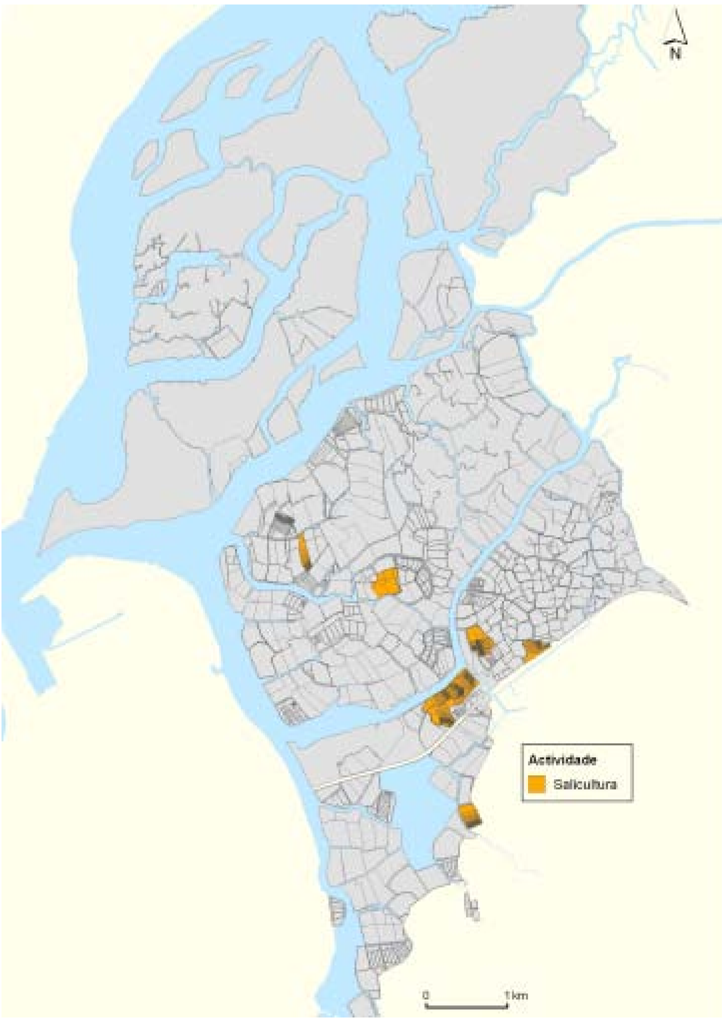
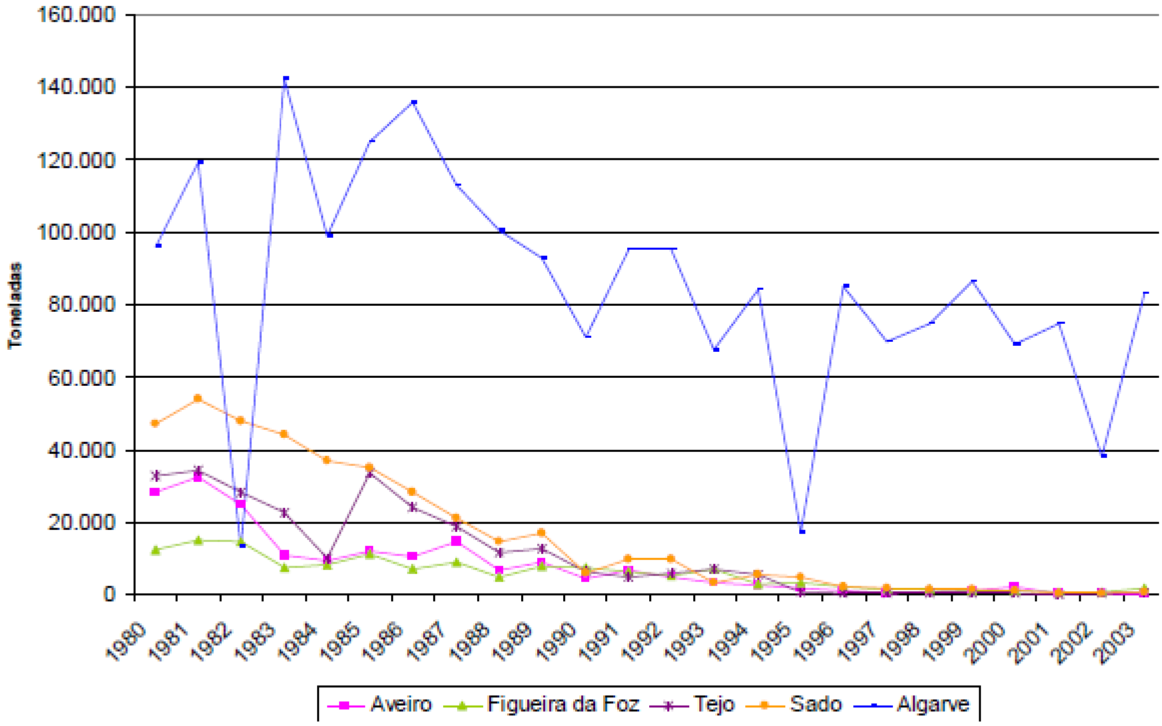


Figure 12 Active salt production units (MultiAveiro, 2007).

Salt extraction in Aveiro peaked in the 70's with around 60,000 metric tonnes of yearly production, however, in recent years production has decrease significantly to no more than 1,000 tonnes/year. The production trends are shown below in Figure 13.



Fonte: Direcção-Geral das Pescas e Aquicultura.

Figure 13 Sea salt production in various location in Portugal, 1980 to 2003 (DGPA, 2005).

The reduction in production is directly linked to factors such as the high costs of maintenance of the salt ponds, the ever increasing cost with the workforce and ultimately to the low value of salt in international markets. In addition to this, competition from companies in the Mediterranean, that possess mechanised and more efficient means of production, which are cheaper than those used in Aveiro, represented a great threat to the local sector and ultimately lead to the current abandoning of the activity.

The abandoning of the salt ponds has also lead to the deterioration of neighbouring ponds as the lack of maintenance directly influenced and increased the cost of maintenance of the ponds in current use. Other difficulties have also been pointed out, namely the fact that there is little associative initiatives coupled with the fact that many there many land proprietors each owning a small parcel of land.

With all these difficulties there are still 11 units operating in the region (total of 36 ha), producing in 2006 a total of 874 tonnes or 1.14% of the national production.

Lately, many salt ponds have been converted for fish aquaculture yet this conversion has been driven by the possibility of capturing EU subsidies. Problems have been raised regarding the fact that many of these projects have not been followed up properly and in fact many of them which benefited from EU subsidies were left unattended and with no maintenance following the initial investments. This has ultimately resulted in further deterioration of the lagoon system as a whole.

Despite these difficulties the sector still has a great potential as the demand for value added products such as gourmet salt “flor-de-sal” have been increasing in recent times. These products have mainly been exported to France, Italy and Turkey.

4.7 Details of the local ancillary sector

The ancillary sector in Aveiro ranges from ship building, ship maintenance, transport and storage of fisheries products, manufacturing and maintenance of fishing gear, fuel and lubricants supply, electrical supplies, hydraulics engineering, cargo, etc. and is greatly important at a regional level. There are no accurate figures for the employment in all these sectors. For instance many of the people carrying out maintenance of fishing gear do it at personal level and are generally not employed by any organisation. It is often the case that retired fishermen do all the maintenance of the fishing gear used by the artisanal fleet. They may be rewarded either with cash or as is often the case with goods i.e. fish resulting from the artisanal fleet's production.

The participation of retired people in repairs and maintenance of fishing gear, especially of artisanal fishing gear, has a great socio-economic importance. Retired fishermen see this as an important complement to their retirement income, irrespective whether they are paid in cash or in goods (fish). It is important to note that when fishermen are paid in goods they are able to sell on the products and retaining the resulting revenue.

With respect to the commercial side of this industry it is also very important as it employs a considerable number of people. Figures for total employment in this industry are not easily obtained as part of the work force is not employed full-time. They are only employed according to the actual needs. There is a residual number of people that has full time employment with these organisations yet the number is estimated to be considerably small (with respect to the fishing gear manufacturing and maintenance; this is generally not the case in industries such as shipbuilding and maintenance).

The majority of the workforce is comprised of men. There are also women participating directly in ancillary activities yet they tend to be responsible for administrative roles only. Most of the work is directly related to the locally registered fleet with exception of the shipbuilding and maintenance services which also targets foreign owned vessels.

Considering the whole of the maritime sector in the region, the turnover generated by the business activities carried out or related to the commercial port stand out and have great importance not only at a local but at a national level. This has been further enhanced due to the recent connection of the commercial port infrastructure to national railway lines.

There is no readily available information into the turnover generated by the sector. It is important to note however, that the oil and gas industry also contributes significantly for the ancillary sector, Aveiro being an important refining hub.

Section 5) Governance

5.1 Key local institutions

There are three main fisheries organizations in Portugal, ADAPI (Associação dos Armadores da Pesca Industrial) and ADAPLA (Associação dos Armadores da Pesca Longínqua). These two organizations represent the industrial fleets operating off shore, the first representing vessels operating off the Portuguese coast (ADAPI) and the second those operating in the high seas in international waters or under agreement with third countries. Aveiro is a very important port at a national level as it is the base for the vast majority of the large size industrial vessels. The third and equally important national organization is AIB (Associação dos Industriais de Bacalhau) which represents the interests of cod industry. This is highly relevant as approximately 70% of the national production of cod products is based in Aveiro. AIB and ADAPLA are based in Aveiro. There are other fisheries organizations based in Aveiro yet are relatively smaller in size and influence at a national level. An example of this is the APARA (Associação da Pesca Artesanal da Ria de Aveiro) which is an organization which represents local fishing companies and plays an important role in the marketing of mollusks especially bivalves such as cockles, clams, oysters, etc. It has noted that there is an increasing diversification in the trade of bivalves in this region. The traded volume of individual species has however not increased in recent years. It seems to have reached its maximum output given the present effort level. Cockles are the most important bivalves produced by the members of this organization.

Analyzing the sector as a whole it is however clear that the various stakeholders do not show a strong associational behavior, in particular those operating in the local artisanal fisheries that consistently show a very individualistic behavior. This behavior is somehow modified and influenced towards less individualistic actions once the fishery is banned or interrupted due to events such as the presence of biotoxins that render the production unsuitable for human consumption. Under these circumstances coordinated behavior and actions seem to prevail and have been noted to yield very positive end results. Local governmental organizations are now capitalizing on this mechanism to promote the creation of associations with view to further develop fisheries co-management in the region.

There are other two institutions which have a major role in the region, these are, the University of Aveiro and AIDA (Associação Industrial do Distrito de Aveiro) the Industrial Association of the District of Aveiro. These two organizations stand out for their capacity to bringing know-how into the region some of which is used in support of maritime activities (e.g. naval engineering, fisheries science, etc.).

5.2 Public intervention

Table below on programmed public-sector intervention for the 5 coming years.

Public investment	Source of funding	What was the investment intended to achieve?	What were the outcomes (or expected outcomes)
€ 5,000,000	€ 3,000,000 public funding € 2,000,000 EU	Not yet defined	n.a.

Figure 14 Detail of the public intervention in Aveiro region.

Public intervention has mainly been carried out through decentralized governmental agencies both at regional and local levels. The Intermunicipal Community of the Aveiro Region or CIRA (Comunidade Intermunicipal da Região de Aveiro) which is part of the local public administration, together with other local public and private entities with interests in the maritime sector are playing a crucial role in providing great vitality for the implementation of the Axis 4 of the PROMAR programme. The GAC-RA (Grupo Acção Costeira da Região de Aveiro) is the main mechanism used for the development of the programme.

A total budget of € 5 million will be spent during the period 2010 - 2013, in projects aiming to improve fisheries sustainability. Approximately 60% of this budget originates from public funding and the remainder originates from EC funding. It is expected that these projects will result in an improved level of cooperation amongst all agents in this sector so that they become more pro-active towards the resolution of common problems. It is also expected that the improved collaboration will also enhance innovation within the sector and contribute the development of new policies. Ultimately, this will help further increasing the importance of the maritime and fisheries sectors in the region.

Section 6) Stakeholder analysis

During the country visit, the heads of the major fisheries associations were both briefed about this project and interviewed with the intent to gather their opinions regarding the development of the fisheries of the sector in the region. The meetings were structure in the following way:

1. Introduction of the consultant and brief summary of its field of expertise;
2. Introduction to the project and its main goals;
3. Objective of the interview and expected results;
4. Provide a summary of the discussion;
5. Exchange of contacts.

The first organization visited was APARA where the consultant met with its President Mr Manuel Soares and Mr Acurcio Santos the Director of Operations. At present the Association represents the majority of the artisanal fishermen operating in Aveiro within the Ria. It has a little over 100 active members.

During the meeting they had the opportunity to express their opinion with respect to the development of the fishing activities in Aveiro. With respect to further development of the artisanal sector, they are of the opinion that an expansion is unlikely as the stocks are already being exploited to their full capacity. Diversification of the activities and fisheries products is also not likely to happen as almost all of the existing products are already being exploited. Moreover, the majority of the fishermen view the aquaculture activity as a threat to their business thus livelihoods. They said there was little possibility of integrating the two activities in order to make them complementary.

An interesting information disclosed during the meeting was that an estimated of 60% of the production originating from artisanal fisheries is generally not reported upon landing. Moreover, it was said that fishermen only report enough catches so that they can renew their annual individual fishing license. The level of underreporting is even more appalling for those vessels that are not registered in Aveiro which do not require historical landings to renew their licenses. There are many boats operating under these conditions. It was nonetheless acknowledged that the authorities are trying to tackle the situation by carrying out more frequent control missions.

It appears there are two main reasons fuelling this behaviour, firstly there was a significant increase in the fuel price and secondly the currently reduced overall abundance of the target species and subsequent low CPUE. It must however be mentioned that underreporting has been a common practice by this fleet for many years and is surely not a new issue. The levels of underreporting seem nevertheless to have increased as a result of the above mentioned factors.

The underreporting, and all the practices associated with it, seem to undermine all efforts towards the implementation of good management practices as well as a coordinated approach by all stakeholders. The kind of behaviour gives rise to the formation of operational groups which operate marginally with the law. Reports of recent incidents between the fisheries inspection authorities and some of the fish traders emphasize the dimension of the problem.

There is however common ground between all members of the association in that they all agree that more needs to be done in terms of changing the policy and/or regulations. They also acknowledge that the level of cooperation between all interested parties should increase significantly to allow for the implementation of a more coordinated management which incorporates the views of all stakeholders. It is likely that the current programmes developed under the Axis 4 – PROMAR will contribute to improving the cooperation between stakeholders at a regional level.

Section 7) Qualitative interpretation and analysis

During the site visit it was not possible to organise a consultation with all stakeholders, it was nonetheless possible to meet with the team leading the Coastal Action Group (GAC) which is the organisation spearheading the projects for the development of the coastal region. It is important to note that the GAC is an inter-municipal organization which activities will be funded mostly by the coastal municipalities themselves together with the EU and partly by the national budget. It is important to note however, that despite the GACs having been formed over the course of last year its actions are still greatly hampered due to the fact that they have not yet been allocated a working budget. It was said that this has taken more time than expected mainly due to the difficult financial situation the country is presently under. It is however expected that this particular situation will be resolved until the end of the year and that funding will be available to initiate part of the planned activities in promoting the development of the coastal region.

7.1 Key events and drivers of change

Evolution of the population

In terms of the evolution of the population, it has been observed that the number of people in Aveiro has declined in recent years. It is thought that the main reasons for this are, firstly the natural ageing of the population and the subsequent lower birth rate and secondly that young people move to neighbouring municipalities as they can more easily afford renting or buying a house. The house prices in the city centre have increased substantially due as a result of the increasing demand for office space in town.

Another factor contributing to the decrease in the population is the development of several industries in neighbouring municipalities, especially in Ilhavo. The creation of new jobs has attracted people from Aveiro into Ilhavo. Indeed Ilhavo has managed to attract people them by promoting the creation of new jobs and incentivising the construction of affordable housing.

As a result of the development of other industries around Aveiro, people working in the fishing industry, who generally earn relatively lower wages than people working in other sectors, have chosen to leave Aveiro to go and live in the surrounding municipalities. There are a number of people who work in the fisheries sector who used to own a house in Aveiro but sold it to go and live outside the city. Ilhavo is the municipality which accommodates the largest number of people working in the fisheries sector.

It is worth noting that 4 or 5 years ago a notable number of people left the region to go working in the fishing industry in other countries on board fishing vessels, namely in Spain, France and Ireland. The majority of these people have however returned over the last 2 years, not only due the recent economic crises but also due to the increase in the availability of jobs in the region, especially in Ilhavo. Indeed, the increase in the availability of jobs was a direct result of the development of new industries within Ilhavo. This development has also driven part of the population to move from Aveiro to Ilhavo.

New industrial projects have also been developed in Aveiro, yet many of them are based on new technologies therefore requiring more qualified yet less people.

Challenges

The presence of a technical university in Aveiro has played an important role in the regional economy and has been an important driver for the development of local businesses. There are a number of small to medium size companies that are direct spin offs from the university's enterprise development centre. Indeed, the number of small to medium size companies has increased significantly over the last decades. These companies have not only incorporated many university graduates but also been formed by many of them with a reasonable amount of success.

These companies are however more focussed on the development of technology and services rather than the development of the fisheries sector. As a result there has been little focus on the development of the fisheries industry in the municipality of Aveiro in recent years. No further development of this industry is anticipated for the municipality in coming years. It is important to note, however, that the existing fish processing units were expended in the past and were able to developed new products and adapt well to new market demands.

The economic growth stemming from the fisheries sector in the region has mainly originated from the surrounding municipalities. The fish processing industry is well implemented in both Ilhavo and Gafanha da Nazare, where exiting units have in a recent past been expanded and investments in innovation have been made.

Considering only the municipality of Aveiro, there has been a reduction in the economic weight of the fisheries sector and a consistent increase in the services and technology industries.

A brief analysis of the production output of Aveiro indicates that over the years there has been great development and innovation with respect to the variety of products manufactured by the local fish processing units, especially those which use cod and hake as raw material.

The biggest challenge Aveiro now faces is not only maintaining the competitiveness of its fisheries-related industry but also of all other sectors which, similarly to other European countries, are competing against imports from countries where the workforce is incredibly cheaper. Innovation, will therefore, play a very important role in maintaining the level of employment in the region.

It is thought that Aveiro will adapt well to the new challenges and embrace innovation in all sectors, given that the district does possess a well qualified and trained workforce readily available to be incorporated into the local companies.

In terms of the fisheries sector per se, the biggest challenge will be trying to maintain the current fleet in full operation as well as all the employment associated to the activity. It is possible that there may be a shift in employment as more people may be employed and/or work in the recreational sector. Should the several projects to buid small marinas along the lagoon go ahead this will surely contribute significantly for job creation in the area.

It has been observed that there is a growing interest by the Spanish people to acquire second homes in the region. The presence of foreign nationals especially those who acquire a holiday home may be positive in general terms as it will boost the local economy yet it has a negative side which is contributing for the increase in house prices and ultimately contribute to driving the locals out of those expensive areas as they would no longer afford the houses.

New opportunities

The recreational boat and fishing industries are, along with the telecommunication components, industrial pipelines, automotive parts, components for machinery used in the production of renewable energy (with special focus on the manufacture of parts for the energy of the waves) are the industries which currently represent the best growth opportunities and those which are bound to have a greater success in the near future.

Aveiro's local government has clear ideas and a few mechanisms in place to incentivise the economic development of the region. Indeed, local authorities together with local industry associations have been supporting many companies with their internationalization initiatives. These incentives (technical and financial) are provided by AIDA which is the local agency for the development and promotion of local companies around the world. The same organization has also provided technical assistance to support the internationalization programme of numerous companies. It has equally been important in promoting training of the staff of the associated companies.

It is likely that the most notable changes in the fisheries sector will take place in the small-scale artisanal fisheries. Indeed, due to the very weak recruitment of young people into fisheries, the average age of fishermen operating in this fleet has been increasing.

A large share of the active fishermen have already reached the retirement age yet a significant number have opted out to continue fishing as they cannot easily find a way to obtain an income in addition to the retirement pension paid by the government which is usually low, hardly enough to cover the normal monthly living expenses.

Instead of carrying on fishing commercially some have converted their boats to accommodate tourists to go on day trips. This strategy has allowed fishermen to earn similar profits to those obtained by commercial fishing yet with much less hardship than the fishing activity requires. This too, represents a good opportunity not only for the retiring fishermen but also to young people who may be interested partaking in this activity.

The large availability of cheaply produced aquaculture fish in the world market may also constitute a good opportunity for the fish processing industry in Aveiro. It would be relatively easy to adapt some of the units to also process other species, in particular those produced in Southeast Asian countries. This issue was raised by local entrepreneurs who have been actively looking at possibilities to expand and diversify their production.

It is thought that this will not have a major impact in the local fisheries as the range of species caught are generally not used for the same purposes as the ones that could eventually come from Asian countries. The major benefit would surely be the creation of new jobs and potentially contribute to improving the trade deficit if the production would be aimed for exports. The industry does believe that there is scope for growth and diversification of the fish products. There is no lack of workforce readily available in the region to work in this sector.

How fisheries management measures affect to the sector

Robust fisheries management has proven to be highly beneficial for the economic growth of Aveiro. More specifically, the re-opening of the cod fisheries in Newfoundland have given a new impetus to the cod processing industry which is by far the most important in the region. The increased supply of cod represents a great market opportunity. All the ancillary industries also benefit from the development of this particular industry. It is worth noting that cod in particular is highly valued in the Portuguese market as well as in markets where there is a large Portuguese community, such as the US and Canada.

In addition to the exports to Portuguese communities throughout the world, exports to some African countries such as Angola and Mozambique have also increased significantly in recent years.

Future fisheries management measures concerning the coastal and small-scale fleets are not expected to produce a great operational impact on the activity. It is thought that the greatest changes will be triggered by and association of factors ranging from increased consumer awareness with respect to sustainability issues to the growing trend of fishermen to associate and form producer's organizations. In this respect there have already been notable changes in particular with respect to the small pelagics fisheries. These changes have lead to better overall governance of the industry.

Due to the very nature of the small scale fleet, i.e. being a mixed fishery carried out by a large number of boats and people it is likely that the impact will be minor. This fleet operates very close to shore and within the lagoon and provides livelihoods for a large number of people. It however important to note that the profits originating from the artisanal fisheries activity are relatively small and do not allow in general a great deal of savings. It is also worth noting that tax evasion is also greater in the small scale fisheries. During the site visit it was possible to confirm that levels of underreporting are often as high as 85%. This represents a significant amount of savings which are not legal. Given the high level of exploitation and the inherent lower catches it was said that a large number of fishermen are still able to work in fisheries and make a living out of it because the level of unreporting is very high and fishermen are able to dispose of an amount of cash which would otherwise be absorbed by the government.

Challenges of aquaculture

As referred above the Aveiro lagoon has excellent conditions for aquaculture activities, so much so that the multinational company Pescanova has developed a large scale project there. It is believed that the production of fish originating from Pescanova will not compete directly with the local fishing sector as a large share of the production is aimed for export.

Given the scale of the project it is thought that it could in fact represent a significant opportunity for the fish processing units which will have good quality raw material at their doorstep. This has already been considered by several companies yet it was not possible to verify if this has been capitalized by local companies. The current output of the project is still low as the company is not yet working at its full capacity.

With respect to a large expansion of the industry, the national environmental authorities are keeping a very close tab on further aquaculture developments. They say that the actual impacts of this project need to be fully assessed before further plans are devised. At the moment only semi-intensive culture systems are allowed within the lagoon, and from the total available area destined for aquaculture, only around 50% are currently in use. The main purpose for this is to ensure the biological stability of the lagoon.

In fact, one of the major challenges will be ensuring the sustainability of the aquaculture industry not only locally but also concerning other external factors (e.g. ensuring fish feed used in the production originates from sustainable sources) which are also important in a global context.

Representation of the fisheries sector

The fisheries sector is well represented locally and at a national level through producer's organizations. These organizations have constituted a good and efficient communication channel between the sector and the administration. There are however some issues in terms of the representation of the small scale sector. The sector is represented by a number of associations that actively represent the fishermen's interests. There are nevertheless some fishermen who are currently independent, not belonging to any of the existing associations.

Due to the fact that there are large number of fishermen in this sector, it also means that the probability of disagreements to occur is also greater. This explains not only the number of existing associations but also the number of fishermen who do not belong to any of the existing associations and are therefore underrepresented within the local context.

Fishermen who do not belong to any association may be more likely to act illegally when it comes to reporting catches. These fishermen are also more likely to fail to report the profits obtained with the activity to the tax authorities. This is not to say that fishermen who are part of fishermen's association do not act in this fashion yet in theory control is slightly tighter for those who are associated.

With this respect, the Coastal Action Group (GAC) will play an important role in incentivizing the creation of stronger associations and even promoting the idea that some of the existing associations would benefit from merging as they would gain representative weight. Part of the GAC extended objectives is to provide a forum in which all stakeholders (fisheries and non-fisheries related) could discuss the utilization of the lagoon and find solutions to common problems. This forum would equally be the main channel through which it will be possible to promote not only further development of all activities related to the lagoon but also promote the sustainability of it utilisation.

7.2 Adaptation

Given the current industrial development in the region it is likely that Aveiro's economy will improve further and that the municipality will end up attracting more people to come and work in the city. The quality of existing access infrastructures will surely contribute positively to incentivizing people to come and work in the municipality however, also due to the easy access to Aveiro, it is possible that people come and work in Aveiro but do not move into the city. The main reason for this is of course that house prices are considerably higher than those in surrounding municipalities.

In summary it is possible to say that the economic landscape is adapting, as the number of the companies operating in the secondary and tertiary sectors have increased substantially in the past couple of decades. For this reason Aveiro is now able to incorporate a greater amount of qualified and well paid workforce. The telecom, automotive and electronic components industrial sectors will play an important role in the development of Aveiro's future economic growth.

The fisheries sector has become increasingly important in neighbouring municipalities and its relevance has notably decreased in Aveiro. One other industry which is expected to grow significantly is construction of parts for the generation of electricity from renewable resources, namely wind and waves.

In terms of adaptation of the fisheries sector it will pretty much depend on and follow the implementation of new regulations imposed by both the EU and the national fisheries administration. It is however anticipated that the greatest change will be observed in the small scale sector as there might be a large scale conversion of fishing boats to accommodate tourists and taking them out for fishing day-trips. Another of the expected changes in this fleet is that the overall number of boats will eventually decrease with some people abandoning the activity altogether (this may happen voluntarily or through potential scrapping schemes).

With respect to the future development of the fisheries sector as a whole, the government produced a national strategic plan (PENP) for the period 2007- 2013.

The strategy emphasizes the need for an improved fisheries management plan given the observed reduction in catches and consequent restrictions of fishing opportunities. The goal of this plan is to define both the main objectives and national priorities for the fisheries sector, not only considering the CFP but also other issues not referred within it. The plan provides a strategic vision about the national fisheries policies as a whole, including the development of the sector for the mentioned time period.

The national plan has been used as a tool to maintain the importance of the fisheries sector as well as incentivizing people to remain in the coastal region, avoiding mass immigration to large cities in search for job alternatives. The strategy highlighted in the plan is based on four pillars, namely:

1. Improve the competitiveness of the fisheries sector in concert with fishing opportunities, through the renovation of fishing boats and through specific support packages to the small scale fisheries. This also includes finding new mechanisms leading to the implementation of better conditions for marketing the fisheries products. In addition to this also finding mechanisms to further develop salt production together with the restoration of the salt ponds; including the promotion of this sector by creating new products with better quality;
2. Further promotion of the aquaculture industry and create a national aquaculture operational plan;
3. Increase added value to fisheries products, especially to processed fish products, aiming to increase exports;
4. Ensure the sustainable development of the coastal zones, including the creation and modernization of small fisheries infrastructures that promote tourism, environmental protection and preservation of local social and natural heritage.

In summary the PENP constitutes the framework for the implementation of the national fisheries policies which comprise of development actions which are funded by the European Fisheries Fund under the scope of the operational programme presented by the Portuguese government and approved by the European Commission in December 2007.

Concerning governance issues, the local governmental and administration institutions will be incentivising with great emphasis the need to associate with a view to improve the representativeness of all sectors. Clarifications and training sessions will have to be carried out to ensure that stakeholder become more pro-actively interested in organising all the activities taking place in the lagoon as well as find means o optimizing the use of the lagoon in a fashion that sustainability if fully ensured.

There are indications that these initiatives are very welcome by all stakeholders yet the right forum has not yet been created. It is expected that the GAC will have a crucial role to play in this field.

7.3 Future development of the community

The aging of the population might be a determining factor in the development of the community of Aveiro. It is however, thought that this trend will be counteracted given the development of new industries and the creation of future job opportunities which will most likely contribute to attracting attract a younger population into the area.

In terms of governance, the municipality has been actively promoting the participation of the community in decisions concerning the development of the various initiatives both in the city centre and in surrounding areas. This has resulted in a true participatory decision making process which the general population seems to have embraced with great enthusiasm. The municipal council has acknowledge how good the participation of the population was in these initiatives and is seeking to adopt a participatory approach to many other issues which are also linked to the development of the region.

The overall governance in Aveiro is expected to undergo further improvement by incentivising a larger share of the population to actively participate in the discussions preceding the development of projects in the municipality. It is thought that this will be a very important driver for the optimization of use of the lagoon, the creation of employment via public and/or private sector projects, as well as contributing to ensuring the sustainability of the overarching use of the aquatic resources and the lagoon itself which is undoubtedly a vital asset and important feature for Aveiro

7.4 The role of public intervention in the past and in the future

Public intervention has had a crucial role in the development of the fishing industry in the region. Public intervention dates back many years, having had its main contribution during the expansion of the cod fleet in the 1950s. After a great expansion of the fisheries support infrastructures during the first half of the 20^{th} century, public intervention decreased significantly, only to pick up later during the expansion of other activities mainly related to commercial shipping.

During the years immediately after Portugal joining the EU, there were large investments in all types of infrastructures in many locations around the country. These investments included the construction of infrastructures aiming at further developing the fishing industry in Aveiro. At this time many port equipments were both updated and upgraded and the port is now considered to have the adequate dimension and structure to handle all the volume of fish that is currently landed in this port. In addition to the improvement to the fishing port facilities the commercial port has also benefitted from these investments. The volume of commercial vessel traffic has increased substantially over the last 15 years yet the existence of the oil refinery has provided a great overall contribution to this increase.

Given all the investments carried out in the past coupled with the fact that no major increase in the volume of fish landed at these facilities is expected, public intervention in the fisheries sector in the form of construction of infrastructures is not anticipated and at the time this report was produced there were no official plans for investments. There are however, planned investments in the social front. Projects to encourage fishermen to create producers' associations, implementation of co-management principles, promote community cohesion, etc. These investments will be carried out under the supervision of the FARNET (EU) project and its staff. Interesting initiatives have been developed in the last few months and proposals for the development of these projects are already underway.

In summary it is possible to assume that in Aveiro, there are currently no further requirements for fisheries infrastructures but there is a great need to incentivise the establishment of fishermen and producer's associations as well as increasing the involvement of the general public with the sector, i.e. to promote its sustainability, to help adding value to the fisheries products and improve the communication between all stakeholders.