

# Study of the infrastructures and the fishing power in Gran Canaria



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**Study of the Infrastructure and Power Fishing in Gran  
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# **Analysis of the Infrastructure and Power Fishing in Gran Canaria**

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## **Abstract**

In Gran Canaria, the fisheries sector is basically artisan, characterized by small size vessels and daily fishing days. This sector leads paired infrastructures in the ports that have undergone major changes in recent years, from being small dykes or beaches and carries out the activities manually to have ports and machinery devoted to the fisheries sector. This expansion has required large investments, not only for the construction but also in the subsequent maintenance, so that leaves the management of these infrastructures in the brotherhoods of fishermen hands. This sector, over time has had to live with other sectors such as tourism, aquaculture or recreational, sharing space and infrastructure.

**Keywords:** Infrastructure, oversized, overcapacity, overfishing, artisanal fisheries.

## **Resumen**

En Gran Canaria, el sector pesquero es básicamente artesanal, caracterizándose por barcos de pequeño porte y jornadas de pesca diarias. Este sector lleva emparejado unas infraestructuras en tierra que han cambiado mucho en los últimos años, pasando de ser pequeños diques o playas y realizar las actividades a mano, a tener puertos y maquinarias dedicadas al sector pesquero. Esta expansión ha requerido de grandes inversiones, no solo para la construcción sino también en el posterior mantenimiento, por lo que le deja en manos de las cofradías la gestión de estas infraestructuras. Este sector, con el paso del tiempo ha tenido que convivir con otros sectores, como el turismo, la acuicultura o el recreativo, compartiendo espacio e infraestructuras.

**Palabras clave:** Infraestructura, sobredimensión, sobrecapacidad, sobreexplotación, pesquería artesanal.

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## **1. Introduction**

The excessive fishing capacity, in large part motivated by overcapitalization, is becoming a difficulty with strong negative implications at the international level, regional, national and even local scale (Castro, 2009). The ecological, economic and social consequences of this fishing overcapacity have been the subject of scientific, academic and policy concerns (Pauly, 2008).

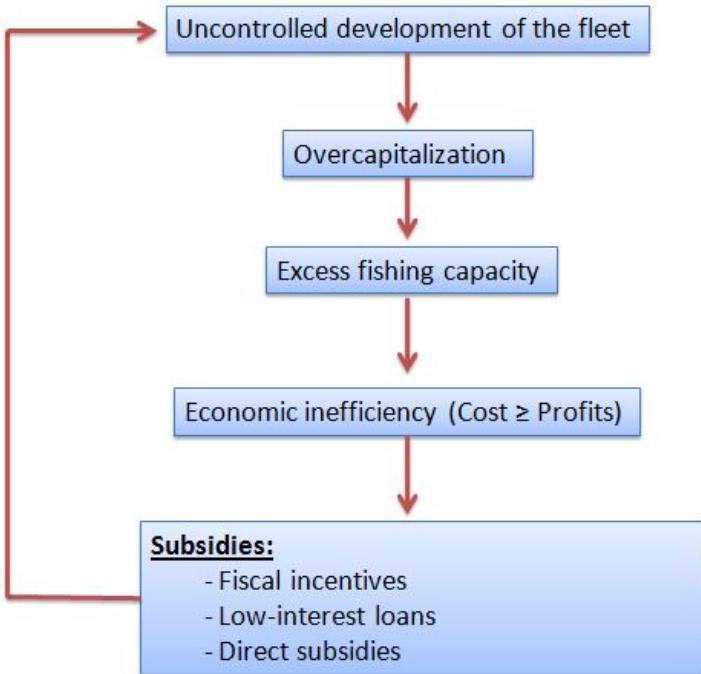
Most of the world's major fishing nations have an excess of fishing capacity (Pauly, 2008), whose most immediate consequence is not just an overcapacity in terms of capital, labor and supplies assigned to a particular fishery, but also increasing threat to the sustainability of resources (Castro, 2009). In other words, adverse economic results and biological overfishing. Overcapitalization in fisheries gives rise to the wastage of capital investment and, therefore, to an excessive cost of capture (FAO, 1998; 2010). Despite the fact that fisheries worldwide capital moves around the 78,400 billion dollars annually (data from 2005), economic losses in marine fisheries resulting from mismanagement, inefficiency and overfishing, reach 50 billion dollars a year, according to the World Bank and FAO (October 8, 2008). In the past three decades, the total losses are around 2 trillion dollars. The estimates exclude losses related to recreational fisheries, tourism, illegal fishing, loss of biodiversity and implications for carbon cycling in the ocean (World Bank, 2008).

This exploitation strategy with difficult economic sustainability would be impossible without the subsidy policies. For example, USA between 1996 and 2004, it allocated subsidies to the fishing industry worth 6,400 million dollars (an annual average of 713 million dollars). However, 56% of total aid went to purposes considered "harmful" for the resources sustainability, increasing the fishing overcapacity, representing 44% of them the fuel subsidies. The fishermen are exempt from taxes on

fuel, but also have support for building and maintaining ships. Also they are exempt from payment of port services. 44.4% of total aid was ambiguous utility (e.g. much of the research is intended to increase the commercial exploitation of stocks). In conclusion, the U.S. Administration subsidizes a 1/5 of the value of fisheries production in the country (Sharp and Sumaila, 2009). Unfortunately, the fisheries policy developed in the European Community is not very distant from U.S., rather it is much more subsidies. Between 2000 and 2006, the EU spent 5.6 billion Euros (an average of 1253 million euro per year through the Financial Instrument for Fisheries) to subsidize the fishing industry (Sporrong and Bevins, 2002). Curiously, some of these grants were used for the construction of new ships, knowing that the current fleet has an overcapacity of between 40 and 60%.

This situation is likely to be leading to the collapse of the great majority of stocks(FAO, 2010).Overinvestment is leads to over-capitalization, and the latter to oversizing and resulting in resources over-exploitation (Fig. 1), altering the principle of reconciliation and balance between conservation and preservation of biodiversity and its responsible use. According to Myers and Worm (2003), industrial fishing reduces fish community by 80% in just 15 years of activity. That is, at present, after 60 years of industrial exploitation would be less than 20% of the biomass of fish existing in the mid twentieth century. On the other hand, the large predators biomass (tuna, swordfish, sharks, etc.) would now only 10% of the estimated pre-industrial period.

**Fig. 1 Capital circulation in the fisheries sector (Extracted: Freire, 2002) / Circulación del capital en el sector pesquero. (Extraído: Freire, 2002)**



The theoretical conceptualization and practical tools to assess and manage the fishing capacity (over or underutilization of capacity) are still in a development phase, as always the action taken in fisheries have been aimed at reducing the nominal fishing effort fishing effort nominal (scrapping of vessels, closed seasons, gear restrictions, etc.). The treatment of management problems in developing countries where the availability of data and information, professional training and infrastructure to carry out and supervise the management policies are inadequate and where, however, the costs and losses due to this problem are probably the largest.

The problem of management of fishing capacity was formally addressed by the FAO Committee on Fisheries (COFI) in 1997, the growing concern of excess supplies and capitalization in world fisheries. The work done by FAO on this basis resulted in the preparation of the International Action Plan for the Management of Fishing Capacity (FAO, 1998a and 1998b), which was adopted by COFI in February 1999 (FAO, 1999).

For this organism the problem is essentially that there are too many vessels or excessive exploitation capacity in a growing number of fisheries. The existence of excessive fishing capacity is largely responsible for the fisheries resources degradation, the demise of food production potential and significant considerable economic losses (FAO 1999, FI: MM/99/2. Meeting of Ministers Responsible for Fisheries). This is particularly evident in the form of redundant fishing inputs and the overfishing of the greater value stocks.

Excessive fishing capitalization affects national fisheries around the world and extends more and more to fisheries offshore. This overcapacity has been a progressive phenomenon due the following factors according Gréboval (2007): (i) the effect of the extension of maritime areas under national jurisdiction in public and private investment strategies, and operating policies of national exploitation of new economic zones (EEZ), generally accompanied by considerable subsidy programs, (ii) the failure of fisheries management, in general, and commonly used management methods, in particular, as the total allowable catch (TACs) and other mechanisms that regulate basically catches more than the exploitation capacity it self, (iii) the relative mobility of the capture capacity, made possible a general transfer of excess capital between fisheries, in areas under national jurisdiction and in areas of free acces at open sea, (iv) the continued profitability of fishing activities, due to technical progress and the relative inflexibility of prices have largely offset the lower yields in over-exploited fisheries, (v) the changing nature of this sector that is increasingly competitive and requires greater use of capital, and whose markets are now based largely on products that are traded internationally, and (vi) weak fisheries management in many countries has allowed the activity of vessels from other countries or the same, without having proper monitoring and enforcement capacity.

Consequently, the origin of excess fishing capacity is based on two elements: the development of an institutional tendency widespread support fisheries investment, considered as strategic sector, and under from overfishing in open access conditions. Possibly for this reason, the Code of Conduct for Responsible Fisheries (FAO, 2005) recognizes that excessive fishing capacity threatens to world's fisheries resources and their ability to provide sustainable catches and benefits to fishers and consumers. In Article 6.3 recommended: "States should prevent overfishing and excess fishing capacity and they should implement management measures to ensure that fishing effort is proportional to the production capacity of fisheries resources and their sustainable utilization".

Fisheries as mature, the effort reallocation presents major difficulties; the fishing capacity (in effort form that could be applied to various alternatives fisheries) is becoming increasingly too large for existing opportunities and begins to pose a threat to many fisheries. This occurs often in a cascade (when a population is overfished and it is subject to effective management, there is a significant transfer of fishing effort to the next population more favorable, which is then subjected to a progressive overexploitation, ...) In other words, it begins to be seen in this sector a overcapacity. If no one previously taken part, presents the problem of introducing measures to control the capacity in a situation of excess capacity, when the sector often have financial difficulties due to a declining catches.

Traditionally in the Canary Islands fishing has been handmade (not considered fleets or portions of fleets have been fishing or fishing in waters of third countries, and establish the island ports as a logistics operations bases, primarily for downloads and stores, e.g. trawlers of ANACEF, Sardinal of Lanzarote, etc.) generally prevailing small boats and craft arts (Bas et al., 1995). However, it is important to consider the role

played by the fishing agreements with Morocco and Mauritania in the structure of the archipelago's fishing industry; because they assumed that the islands were a benchmark for many boats, not just Spanish Operating in West African fishing grounds, particularly in the area known as the Canary-Saharan Bank. This allowed the development of infrastructure and industries that were linked to these fleets, while also gave support to a major national trawl fleet (mainly made up of ship-owners Galician and Basque, dedicated to fishing for squid and crustaceans), tuna (also with a strong Basque ship-owner presence), plus the purse seine fleet dedicated to the capture of sardines and related to the canning industry in Lanzarote (Bas et al., 1995). This large fleet, settled mainly in Gran Canaria, Lanzarote and Tenerife led to greatly boost the fishing industry in the islands, creating large amount of infrastructure and businesses directly related to this sector. On GranCanaria and Lanzarote islands there were several fish conservation enterprises (canned, salted, frozen ...) that not only provided work for many people but increasingly also strengthen the importance of this sector in the Islands' economy (Bas et al., 1995). After the difficulties in negotiating fishing agreements between Morocco and the European Union, this agreement is not renewed in 1995 (Holgado and Ostos, 2002), which produced a large decline in the Spanish fishing sector, heavily dependent on Canario -Saharan Bank. This causes many companies in Canary Islands related with fisheries closed and many of the ships that made up these fleets disappeared by the inability to maintain the volume of catches that supported its existence. After the disappearance of the vast majority of trawlers, tuna fleet and artisanal that working fresh fish on the African coast (moving them to other fishing grounds away from the island, selling them to third countries or simply scrapped), only small boats have remained engaged in coastal fishing, but whose operation was not related to the infrastructure created to accommodate large fleets mentioned above (e.g. Puerto de la Luz).

However, over the last three decades have also developed specific infrastructure for the craft fishing fleet that fishes in neritic waters of the islands (Bas et al., 1995), in order to improve the operability of the same and achieve improvements in conservation and marketing of fishery products. Thus, on the Gran Canaria, there are six main points to discharge of fisheries products obtained by these small craft boats along the coast, which are Agaete, San Cristobal, Melena, Castillo del Romeral, Arguineguín and Mogán, consisting of around brotherhoods or fishing cooperatives (GESPLAN, 2009, Moreno-Herrero, 2011). In these places are installed the control points of first sale to the catch taken by professional fishermen. In these areas fishing tradition has always been, so far settled in their small groups and shelters for boats, and over the years these small infrastructures have evolved to suit the needs of industry and have become in main points of the island fishing activity.

Necessary infrastructure to support the present insular fisheries are relatively large, as not only takes cold rooms and ice making for the preservation of the catch, scales for measurement, etc., but also requires the machinery for the maintenance and support vessels, such as cranes, travelifts, water, electricity, etc., so that investments, and subsequent maintenance, that must be carried out are numerous. An improper dimensioning of this investment or the lack of efficient use programs and infrastructure maintenance, with management policies without clear objectives , even erratic in terms of circumstantial priorities, they can lead to over-capitalization sector, induced by a fictitious situation of economic viability generated by government, not only those with direct expertise in fisheries.

On the other hand, the advance of many of the large infrastructure associated with the professional fisheries sector has been in the lee of the great development experienced by recreational fishing. In recent decades the number of recreational boats

has experienced a progressive increase, bringing with it an important industrial sector dedicated to this type of entertainment, leading to a fishing fleet (which is added the other types of fishing recreational), which share and compete not only for fishery resources, but also for port infrastructure and their services. In many cases the progress of the recreational sector has been higher than the professional, so the buildings have been designed to improve the facilities in this sector (installation of pontoons, recycling centers, cranes for grounding, works to improve access, ...) helping to exaggerate the needs of the fisheries.

For the Gran Canaria geomorphological characteristics there are many points (ports, docks, piers and small beaches) where there is the introduction and grounding for small boats (Bas et al, 1995), someone of professional nature (eg El Burrero, Arinaga, El Pajar, Playa del Águila, etc.), but mostly dedicated to fishing, both cane and spear fishing. Generally these small points are not usually associated with large infrastructure, as many are small jetties or coats with a ramp (Sardina del Norte or the port of the Aldea de San Nicolas, for example), while in others there is nothing and the boats are beached right on the beach (eg El Puertillo, Arinaga, El Pajar, Playa del Águila, Las Canteras ...). This "peripheral" activity investment is no in public infrastructure to facilitate access or maneuverability to increase the fishermen safety, but affect the investment to be allocated in the development of management strategies and control, particularly catch and effort realized.

The objective of this study is to evaluate the adequacy of the infrastructure size for fishing in the waters of Gran Canaria, and their status of use, the carrying capacity of fish stocks, within the sustainability parameters of these. We will seek to determine whether the alleged over-sizing of fishing power, through the available infrastructures and their use level may have favored an increase in fishing effort, to facilitate the

operation of the fleet and over-capitalization sector, thereby stimulating the resources overexploitation.

## **2. Material and Methods**

For this study we have conducted a search of bibliographic material on fisheries and the artisanal fishery that takes place in waters around the Canary Islands, through various web portals such SCOPUS or ASFA and documents available through the University of Las Palmas de Gran Canaria (ULPGC) library website. In addition, specific interviews were conducted ( $N = 12$ ) to professional fishermen of the 6 of Gran Canaria brotherhoods (see Annex I) in order to ascertain their views on the state of fisheries in the island. On the other hand, interviews were also carried out with managerial positions (secretaries or managers) of these fishermen brotherhood and cooperatives to collect information on mode of operation of these, as well as their needs and deficiencies, both in management and in the infrastructure (see Annex II). Apart from these mains discharge points, we have visited all the ports, breakwaters and anchorages of the island to set up an infrastructure inventory and the use and conservation status of them. Not only the port facilities have been considered, but all those that, although they were considered secondary (spot clean, first sale, accessibility, cold storage, carts, etc.) that may be related or facilitate in any way with professional or recreational fishing. In addition, the vessels have been recorded in each of the places visited, both the professional (3<sup>rd</sup>) and recreational (6<sup>th</sup> and 7<sup>th</sup>) list. Thus we will expect to make a first estimate the fishing power of the whole fleet.

All this information has led us to make an inventory of available infrastructure in main catch discharges points, and those coast places where there are boats or they can be input or output.

The data for landings by the artisanal fleet between 2006 and 2010 has been used have been provided by the Viceconsejería de Pesca del Gobierno de Canarias, and come from the points of first sale of fishermen brotherhood and cooperatives located in Agaete, Melenara, Castillo del Romeral, Arguineguín and Mogán. In San Cristóbal (Las Palmas de Gran Canaria) have used data from 2007, 2008, 2009 and 2010, as its point of first sale was operational in 2006.

We have been a literature review of available information, both written and in pictures. We have consulted several technical reports prepared by the Cabildo Insular de Gran Canaria (Plan Territorial Especial PTE-30 de Ordenación de Puertos Deportivos Turísticos e Infraestructuras Náuticas (Documento de Avance)), as well as reports about fishing in the island or available infrastructure to fishing from 1980's, developed by Centro de Tecnología Pesquera de Taliarte researchers (now Instituto Canario de Ciencias Marinas). These reports and technical documents are not public and are not available on web, so it is what is known as "gray literature".

On the other side we have tried to analyze the brotherhoods and fishermen's cooperatives configuration and structure, and the infrastructure that they have available and under their responsibility in order to determine the efficiency of each of these entities. For this, we have evaluated the available infrastructure in all port facilities and brotherhoods /cooperatives, by sizing the fleet size/capture and use conservation status of these., rated them according to criteria previously established (Table 1). To build an potentiality index we have identified the present infrastructure at each point and is

assigned the maximum value, on an increasing scale from -5 to 5 in efficiency terms. A value of zero is given when the infrastructure does not exist, while negative values are assigned when the evaluated infrastructure is present but not used for functions for which they were installed, subtracting efficiency, or they are used for different functions not related to fishing. Considering this, first we have listed the available infrastructures and we have assigned them the maximum value, five, and then we have calculated the total potential that could have the brotherhood / cooperative. The facilities are divided into four categories (Table 2) depending on its use and its impact on fisheries.

**Table 1 Scores of existing infrastructure. / Puntuaciones de las infraestructuras disponibles.**

Infrastructure	Minimum score	Maximum score	Criterion
<b>Port</b>	0	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security.
<b>Situation of the brotherhood</b>	0	5	Scoring is based on the distance with the discharge area, stranding and offices.
<b>Occupancy rate</b>	0	5	It assesses the present occupancy rate, compared to initial when the port was built
<b>Travelift</b>	-5	5	Depending on the load capacity, the number of uses and service life. If not used the score will be negative.
<b>Crane</b>	-5	5	Depending on the load capacity, the number of uses and service life. If not used the score will be negative.
<b>Forklift</b>	-5	5	Depending on the number and use have to be given and life. If not used the score will be negative.
<b>Ice machine</b>	-5	5	Depending on the number and use have to be given and life. If not used the score will be negative.
<b>Cold store</b>	-5	5	Depending on the size, use and occupancy status. If not used the score will be negative.
<b>Refrigerated vans</b>	-5	5	Depending on the use, condition and service life. If not used the score will be negative.
<b>isothermal truck</b>	-5	5	Depending on the use, condition and service life. If not used the score will be negative.
<b>Fuel tank</b>	-5	5	Depending on the capacity and usage. If not used the score will be negative.
<b>1<sup>st</sup> sale</b>	0	5	Depending on whether or not providing the service.
<b>Store</b>	-5	5	Depending on size and occupancy status.
<b>Office</b>	-5	5	Depending on use.
<b>Rooms equipment</b>	-5	5	Depending on number, use and comfort.
<b>Fish market</b>	-5	5	Depending on whether it is renting or not. Should not be used but is built their score will be negative.
<b>Restaurant</b>	0	5	Depending on whether it is renting or not.
<b>socio-tourism importance</b>	0	5	Scoring is based on the cultural, tourist or business it has.
<b>Recreational sector</b>	0	5	Depending on the services provided to the recreational sector.
<b>Aquaculture</b>	0	5	Depending on whether serving the aquaculture activity.

**Table 2 Grouping of the infrastructures in different categories. / Agrupación de las infraestructuras en las distintas categorías.**

<b>Category</b>	<b>Infrastructure</b>	<b>Maximum potential</b>
<b>1º</b>	Port Brotherhood situation Occupancy rate	15
<b>2º</b>	Travelift Crane Forklift Ice machine Cold store	25
<b>3º</b>	Refrigerated vans Isothermal truck 1 <sup>st</sup> sale Store Office Rooms equipment Fuel tank	35
<b>4º</b>	Fish market Restaurant Socio-tourism importance Recreational sector Aquaculture	25

With analysis we have obtained a maximum potential value for each category.

Categories are made according to the following characteristics: (i) 1<sup>st</sup> category fall the large infrastructure, (ii) 2<sup>nd</sup> category includes machinery designed to provide assistance to vessels, movement of a catch from the boat to the storage and for their conservation, (iii) 3<sup>rd</sup> category are facilities available for storage, management and marketing; and (iv) 4<sup>th</sup> category includes all those equipments which can generate foreign income from the own extractive activity carried out by professional fishermen. In this case, the fish market existence in the brotherhood could be understood as a form of marketing fishery products directly and, therefore, would fall under the third category, however in Gran Canaria when this facility is present and used, it is always rented by non-fishermen for hire, like restaurant.

We created a card with available information about each brotherhood/cooperative (Tables 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32) with first point of sale (to

be the main points of landed catches on the island), through which its efficiency was evaluated using the criteria described in Table 1. Once having the potential value and the level of use, we have calculated an efficiency index calculated from equation (1).

$$\text{Efficiency index} = \frac{\text{Use Level}}{\text{Maximum Potential}} \quad (1)$$

Thus we have standardized the efficiency of different brotherhoods despite their high heterogeneity in infrastructure and its degrees of use, assessing only resources available.

From the efficiency for each of the four infrastructure categories for brotherhood/cooperative, we calculated the loss rate respect the theoretical maximum. For this, we multiplied the efficiency in each category by the total annual catch landed per brotherhood, and then subtracted the total initial capture value (see equation 2). Thus values of efficiency losses were bounded between 0 and 1.

$$\text{Efficiency losses} = \text{initial capture} - \text{initial capture} \times \text{Efficiency ratio} \quad (2)$$

We also performed an inventory of available infrastructure for fishing on all ports, shelters, harbors, beaches, etc (Annex III) where it develops some kind of professional or sport fishing. In those places were surveyed facilities and number of vessels by category.

Based on data from recreational fishing licenses issued by mode in the Canary Islands in 2005 (16.200), we performed an extrapolation to estimate the number of licenses by fishing type for 2011 in Gran Canaria, taking note that in that year the total number of recreational fishing licenses for the entire archipelago was 96,217 (Source: Consejería de Agricultura, Ganadería, Pesca y Medio Ambiente).

### **3. Results**

In Gran Canaria, there are six major ports that are home to almost all of the artisanal fleet that operates daily in water around Gran Canaria, which are Agaete, San Cristobal, Taliarte, Castillo del Romeral, Arguineguín and Mogán. These ports must be added a large number of beaches, jetties and shelters that also serve as the basis for a small number of boats, especially small-sized, wooden hull and generally they are usually aground on the beach (e.g. Playa del Águila, Arinaga, El Burrero, Las Alcaravaneras, Las Canteras, Bañaderos, El Puertillo, Sardina del Norte, etc.).

Within the precincts of the major ports have been installed points of first sale, where the Gobierno de Canarias makes a control the daily catch, prior and indispensable to marketing. Generally, these first sale points are managed by the brotherhoods or cooperatives of fishermen established in these ports. These brotherhoods also provide various services to fishermen partners, such as fuel supply, purchase of materials for arts and vessels, administrative procedures (insurance, licenses, grants, etc.), relevant information (weather forecasts, changes in regulations, grants and subsidies ...), training course, etc., being a great help to them. Therefore, and for that, the Autonomous Administration has provided the brotherhoods of various infrastructures to facilitate their work in supporting the professional fishing sector in the islands, but also the same for their own internal structure, work dynamics and so management, often their economic maintenance can be a handicap for the government and fishermen. However, their need as the backbone to fisheries sector with many gaps and weaknesses of various types (technical, specific training and economic, trade efficiency, etc.) is today indisputable, although clearly improved (GESPLAN, 2009, Moreno-Herrero, 2011).

The fishing in Gran Canaria has undergone many changes in recent decades, as the advancement in technology in all areas is evident, and it has been incorporated into the fisheries sector, both within the ships at the discharge point. In 1984, infrastructure was almost non-existent, rudimentary boats and appalling working conditions, and barely had breakwaters and the boats discharges are made on beach (Gafo et al., 1984). In that year, the most important catch discharge points taken by the artisanal fishing in the island waters were La Aldea, Agaete, Las Palmas, San Cristobal Castillo del Romeral, Arguineguín and Mogán (Gafo et al., 1984 ), while in Taliarte no data are available. In Tables 3, 4, 5 and 6 we see how they have evolved the same variables from 1984 to 2001, in the main discharge ports today, except Taliarte.

**Table 3 Port and fishing infrastructure in 1984 in different Gran Canaria localities (Source: Gafo et al., 1984) / Infraestructuras portuarias y pesqueras disponible en 1984 en diferentes localidades de Gran Canaria (Fuente: Gafo et al., 1984)**

Port	Cath (tn)	Vessels	Sailors	TRB
Agaete	100	30	50	39,7
San Cristóbal	127	8	28	12,6
Castillo del Romeral	110	35	184	75,1
Arguineguín	900	36	150	198,8
Mogán	650	30	126	142,9

**Table 4 Catch and vessels rates obtained by the artisanal fleet in 1984 in different Gran Canaria localities (Source: Gafo et al., 1984) / Índices de capturas y barcos obtenidos por la flota artesanal en 1984 en diferentes localidades de Gran Canaria (Fuente: Gafo et al., 1984).**

Port	Catch/Vessels	Catch/Sailor	Catch/TRB	Sailors/Vessels	TRB/Vessels
Agaete	3.333,33	2.000,00	2.518,89	1,67	1,32
San Cristóbal	15.875,00	4.535,71	10.079,37	3,50	1,58
Castillo del Romeral	3.142,86	597,83	1.464,71	5,26	2,15
Arguineguín	25.000,00	6.000,00	4.527,16	4,17	5,52
Mogán	21.666,67	5.158,73	4.548,64	4,20	4,76

**Table 5 Port and fishing available in 2011 in different Gran Canaria localities / Infraestructuras portuarias y pesqueras disponibles en 2011 en diferentes localidades de Gran Canaria.**

Port	Catch(tn)	Vessels	Saliors	Total TRB
Agaete	110,55	28	55	120,8
San Cristóbal	62,55	9	29	34,15
Castillo del Romeral	65,33	20	50	46,49
Arguineguín	977,88	60	80	315,59
Mogán	128,27	21	70	177,83

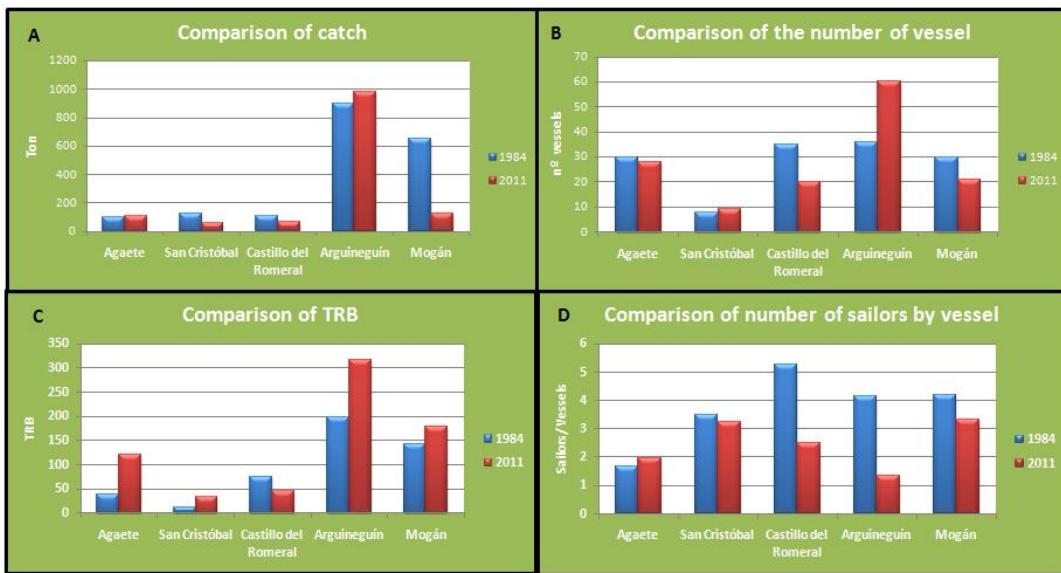
**Table 6 Catch and vessels rates obtained by the artisanal fleet in 2011 in different Gran Canaria localities/ Índices de capturas y barcos obtenidos por la flota artesanal en 2011 en diferentes localidades de Gran Canaria.**

Port	Catch/Vessels	Catch/Sailor	Catch/TRB	Sailors/Vessels	TRB/Vessels
Agaete	3.948,21	2.010,00	915,15	1,96	4,31
San Cristóbal	6.950,00	2.156,90	1.831,63	3,22	3,79
Castillo del Romeral	3.266,50	1.306,60	1405,25	2,50	2,32
Arguineguín	16.298,00	12.223,50	3.098,58	1,33	5,26
Mogán	6.108,10	1.832,43	721,31	3,33	8,47

The vessels technological implementation with satellite positioning systems (GPS), echo sounders, winches, haulers, synthetic nets, etc., has gone hand in hand with an increase in vessel size and engine power, which suggests that their fishing power has increased significantly compared to that recorded in 1984. That fishing power, but has not resulted in an increase in catches as the landings have remained broadly similar (Fig. 2 A), or even declined as it has occurred in Mogán.

On the other hand, the number of boats that compose the artisanal fleet of the island has not experienced large variations between 1984 and 2011 (139 and 138 ships, respectively), although there are differences when analyzing the ports studied, so that decreased in the Castillo del Romeral and Mogán, they remain constant in San Cristobal and Agaete, while only Arguineguín has increased (Fig. 2 B).

**Fig. 2 Comparison between 1984 (blue) and 2011 (red) of landed (A), number of vessels (B), GRT-GRT (C), and sailors per vessel (D) /Comparación entre los años 1984 (azul) y 2011 (rojo) de las capturas desembarcadas (A), número de barcos de pesca (B), Toneladas de Registro Bruto -TRB (C), y marineros por barco (D).**

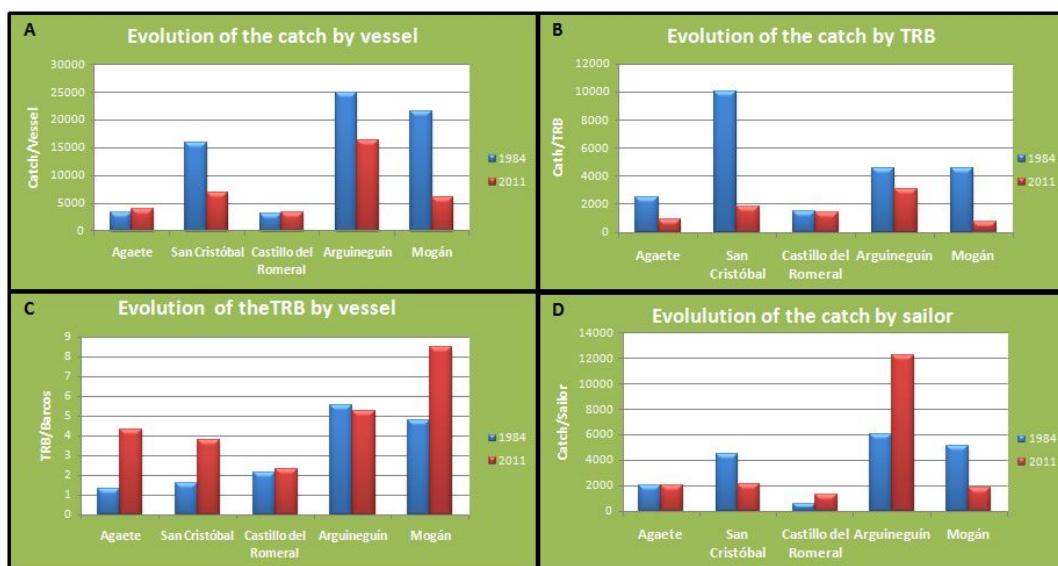


In general, the total GRT (gross registered tonnage or volume of all spaces inside the ship, including cabins, lodges, etc.), in each point has increased since 1984, except in Castillo del Romeral (Fig. 2 C) where it has decreased, which indicates that in general there are more size and accommodation capacity. But if we analyze the GRT in Castillo del Romeral and Arguineguín, the GRT per vessel has been maintained (Fig. 3 C). In Arguineguín the total GRT has increased due to increase its fleet (Fig. 2 B) but not the GRT per vessel (Fig. 3 C), whereas in the case of Castillo del Romeral, the number of boats has decreased (Fig. 2 B) and GRT per vessel too, so that boats are practically the same as in 1984, although being the smaller boats of Gran Canaria fleet and generally they are dedicated to traps and lines. In the rest of the ports has seen an increase in GRT, although it has decreased or maintained the number of boats. Overall, the fleet capacity, in GRTs, of all island has increased compared to 1984 (469 in 1984 and 694.9 GRTs in 2011) despite having reduced the vessel number engaged in commercial fishing, but larger units now.

The technology increase, in the ship and ashore, it has greatly facilitates the sailors work when performing their work, so the sailors number that work per boat fishing has also been decreased. The sailors number per vessel has remained constant in Agaete and San Cristóbal while the rest they have declined compared to 1984 (Fig. 2 D).

Despite the introduction of technical progress and the increase in the fishing capacity of boats the catch has not increased. Thus, in Agaete, San Cristóbal, Castillo and Arguineguín landings have been kept in the same levels as in 1984; while in Mogán have decreased in comparison the same year (Fig. 2 A). Paradoxically, the catch levels per boat have declined in San Cristóbal, Arguineguín and Mogán, while in Agaete and Castillo del Romeral have remained practically constant (Fig. 3 A).

**Fig. 3 Evolution of catch per vessel (A), GRT (B), GRT per vessel (C) and catch by sailor (C) / Evolución de las capturas por barco (A), por TRB (B), TRB por barco (C) y capturas por pescador (C).**



But even taking the larger vessels, the catch per GRT unit has not increased (Fig. 3 B), so the current fleet size is inadequate for the catch level that we have on the Gran Canaria being therefore the fleet oversized. The case that more would be consistent with the fishing level would be Castillo del Romeral, which has decreased the vessels number, maintaining the GRT and also maintaining its catches levels respect to 1984,

while the most oversized would be the Mogán fleet, and even reducing the effective fleet number of (Fig. 2 B), it has increased their fishing capacity (Fig. 2 C), but it gets a catches lower (Fig. 3 A, B, D).

In 1984, all fishing activity is bore on a very limited infrastructure, and in many cases very precarious (Gafo et al., 1984), where nearly all activity was conducted by hand, from the landings of fish or the grounding of boats for example. These infrastructures we see reflected in Table 7.

**Table 7 Infrastructure in 1984 (Source: Gafo et al., 1984) / Infraestructuras existentes en 1984 (Fuente: Gafo et al., 1984).**

Infrastructure	Agáete	Arguineguín	Castillo del Romeral	La Aldea de San Nicolás	Las Palmas	Mogán	San Cristóbal
<b>Level Assigned</b>	N-3	N-2	N-4	N-4	N-1	N-3	N-4
Seawall	Yes	Yes	Yes	No	Yes	Yes	No
Breakwater	No	No	No	No	No	Yes	No
Marking	No	No	No	No	Yes	No	No
Pier	Yes	Yes	No	No	Yes	Yes	No
Illumination	No	No	No	No	Yes	No	No
Crane	No	Yes	No	No	Yes	No	No
Travelift	No	No	No	No	Yes	No	No
Ramp and stranding machine	Yes	Yes	Yes	No	Yes	Yes	No
Esplanade	No	Yes	No	No	Yes	No	No
Small store	No	No	No	No	Yes	No	No
Factory ice	No	No	No	No	Yes	No	No
Ice silo	No	No	No	No	Yes	No	No
Fish market	No	No	No	No	Yes	No	No
Freezing tunnel	No	No	No	No	Yes	No	No
Fridges	No	No	No	No	Yes	No	No
Isothermal truck	No	No	No	Yes	Yes	No	No
Local brotherhood	Yes	No	No	Yes	Yes	No	No
Shipyards	No	No	No	No	Si	No	No
Repair shop	Yes	No	No	No	No	Yes	No
Access of roads	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Water	No	Yes	No	No	Yes	No	No
Diesel	No	No	No	No	Yes	No	No
Power take	No	No	No	No	Yes	No	No

**Table 8 Infrastructures that have been implemented since 1984 (green) /Infraestructuras que se han implantado desde 1984 (fondo verde).**

Infrastructure	Agaete	Arguineguín	Castillo del Romeral	Mogán	San Cristóbal
Seawall	Yes	Yes	Yes	Yes	Yes
Breakwater	Yes	Yes	Yes	Yes	Yes
Marking	Yes	Yes	Yes	Yes	Yes
Pier	Yes	Yes	Yes	Yes	Yes
Illumination	Yes	Yes	Yes	Yes	Yes
Crane	Yes	Si	Yes	Yes	Yes
Travelift	Yes	Yes	No	Si	No
Ramp and stranding machine	Yes	Yes	Yes	Yes	Yes
Esplanade	Yes	Yes	Yes	Yes	Yes
Small store	Yes	Yes	Yes	Yes	Yes
Factory ice	Yes	Yes	Yes	Yes	Yes
Ice silo	Yes	Yes	Yes	Yes	Yes
Fish market	Yes	Yes	Yes	Yes	Yes
Freezing tunnel	No	Yes	No	No	No
Fridges	Yes	Yes	Yes	Yes	Yes
Isothermal truck	Yes	No	No	Yes	No
Local brotherhood	Yes	Yes	Yes	Yes	Yes
Shipyards	No	No	No	No	No
Repair shop	Yes	Yes	Yes	Yes	Yes
Access of roads	Yes	Yes	Yes	Yes	Yes
Water	Yes	Yes	No	Yes	No
Diesel	Yes	Yes	Yes	Yes	Yes
Power take	Yes	Yes	No	Yes	No

Progress on infrastructure issues has been enormous, which currently discharge points are equipped with many facilities previously negligible (Table 8). Currently, many of the infrastructures are managed by brotherhood of each port, with different revenue and expenses for each one (Table 9).

**Table 9 Expenses and revenues from brotherhoods / Gastos e ingresos de las cofradías.**

<b>Brotherhood / Cooperative</b>	<b>Expenses</b>	<b>Revenues</b>
Agaete	Water/Lighth Insurance and machinery maintenance Staff	Restaurant Stranding service Grants Canon Sell ice
San Cristóbal	Water/Lighth Insurance and machinery maintenance Recycling center	Restaurant Stranding service Canon
Melenara	Water/Lighth Insurance and machinery maintenance Staff Veterinary Recycling center	Restaurant Canon Sell ice Grants Stranding service
Castillo del Romeral	Water/Lighth Insurance and machinery maintenance Staff	Restaurant Canon Grants
Arguineguín	Water/Lighth Insurance and machinery maintenance Staff	Restaurant Canon Sell ice Grants Stranding service
Mogán	Water/Lighth Insurance and machinery maintenance Staff	Restaurant Sell ice Grants Stranding service

All brotherhoods presented similar expenses (water, light, insurance and machinery maintenance), furthermore, except in San Cristobal, also the derivatives of the administrative staff. Also, the sources of income are also similar (rental of restaurant, recovery of the canon of capture -at least Mogán-, provision of stranding services for sports vessels, in addition to the needy grants - less in San Cristobal). However, and although there is also a disparity in terms of efficiency of each one of these associations to establish a reasonable use of the infrastructure and equipment to which each has access (Tables 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32), most of them are currently displayed over dimensioned, well above their actual fishing possibilities (Tables 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33).

**Table 10 Agaete brotherhood equipment / Equipamiento de la cofradía de Agaete.**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security.
<b>Brotherhood situation</b>	5	Scoring is based on the distance of the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	It assesses the current occupancy rate, compared to initial when the port was built
<b>Travelift</b>	5	Yes.
<b>Crane</b>	5	Yes.
<b>Forklift</b>	5	There are 3, two small and one large of 7 ton.
<b>Ice machine</b>	5	There are 2, one of 5 tons of stone and another 2 tons in scale.
<b>Cold store</b>	5	There are 2.
<b>Refrigerated vans</b>	5	There are 1.
<b>Isothermal truck</b>	5	There are 1.
<b>Fuel tank</b>	5	There are two of 15,000 liters each one
<b>1st sale</b>	5	Depending on whether or not providing the service
<b>Store</b>	5	Yes.
<b>Office</b>	5	Yes.
<b>Rooms equipment</b>	5	There are 15.
<b>Fish market</b>	5	Yes.
<b>Restaurant</b>	5	Yes.
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance.
<b>Recreational sector</b>	5	Coexist in the dock, pontoons, ramp and stranding area.
<b>Aquaculture</b>	0	Are unrelated.

**Table 11 Maximum potential of the Agaete brotherhood / Máximo potencial de la cofradía de Agaete**

Category	Infrastructure	Values	Maximum potential
<b>1<sup>st</sup></b>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
<b>2<sup>nd</sup></b>	Travelift	5	25
	Crane	5	
	Forklift	5	
	Ice machine	5	
	Cold storage	5	
<b>3<sup>th</sup></b>	Refrigerated vans	5	35
	Isothermal truck	5	
	1st sale	5	
	Store	5	
	Office	5	
	Rooms equipment	5	
	Fuel tank	5	
<b>4<sup>th</sup></b>	Fish market	5	20
	Restaurant	5	
	Socio-tourism importance	5	
	Recreational sector	5	
	Aquaculture	0	

**Table 12 Rating infrastructure of Agaete brotherhood / Puntuación de las infraestructuras de la cofradía de Agaete.**

Infrastructure	Score	Criterion
<b>Port</b>	5	It has a breakwater, pontoon, water / light, recycling center, stranding area, ramp, good accessibility, good general condition of the dam and vigilance.
<b>Brotherhood situation</b>	3	The area of 1st sale is far from the fish discharge. The restaurant is separated from the brotherhood building .
<b>Occupancy rate</b>	2	Initially fishing shelter. Currently occupies 15% of the total dock.
<b>Travelift</b>	2	Sometimes is used, as the boats have to get a permit to strand their boats.
<b>Crane</b>	5	It is used daily for the fish discharge. Also it is used to insert and remove engines and ship machinery .
<b>Forklift</b>	2	Little one is used daily and the other two are used occasionally.
<b>Ice machine</b>	2	The scale ice machine is stopped and the other is operating to 50% .
<b>Cold store</b>	3	One cold chamber is used as the ice silo and the other at full capacity.
<b>Refrigerated vans</b>	4	For the fish distribution, meat purchases and the brotherhood staff transport
<b>Isothermal truck</b>	3	It is used occasionally.
<b>Fuel tank</b>	3	They spend about 5,000 liters per month.
<b>1st sale</b>	5	Yes.
<b>Store</b>	5	Save all fishing equipment, first sale, boxes, elevators,...
<b>Office</b>	5	There is an office, meeting room and place for the first sale.
<b>Rooms equipment</b>	5	There are 15 and all are occupied.
<b>Fish market</b>	-5	It is fully equipped, but is not rented.
<b>Restaurant</b>	5	It is rented.
<b>Socio-tourism importance</b>	4	Commercial importance, as is the ferry that connects the Tenerife island with Gran Canaria island. This is a pier with a fishing tradition.
<b>Recreational sector</b>	4	Share a number of areas within the dock, also serving grounding. Pontoons are differentiated.
<b>Aquaculture</b>	0	There is not aquaculture in the area.

**Table 13 Agaete brotherhood efficiency / Eficiencia de la cofradía de Agaete.**

Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	5	10	$10/15 = 0,667$
	Brotherhood situation	3		
	Occupancy rate	2		
2 <sup>nd</sup>	Travelift	2	14	$14 /25 = 0,56$
	Crane	5		
	Forklift	2		
	Ice machine	2		
	Cold storage	3		
3 <sup>th</sup>	Refrigerated vans	4	30	$30 /35 = 0,857$
	Isothermal truck	3		
	1st sale	3		
	Store	5		
	Office	5		
	Rooms equipment	5		
	Fuel tank	5		
4 <sup>th</sup>	Fish market	-5	8	$8/20 = 0,4$
	Restaurant	5		
	Socio-tourism importance	4		
	Recreational sector	4		
	Aquaculture	0		

**Table 14 San Cristóbal cooperative equipment /Equipamiento de la cooperativa de San Cristóbal**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security.
<b>Brotherhood situation</b>	5	Scoring is based on the distance of the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	It assesses the current occupancy rate, compared to initial when the port was built
<b>Travelift</b>	0	No.
<b>Crane</b>	5	There is 1
<b>Forklift</b>	0	No.
<b>Ice machine</b>	5	There are 2.
<b>Cold store</b>	5	There is one for 2 tons of fish.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	5	Capacity of 5,000 liters.
<b>1st sale</b>	5	Providing the service.
<b>Store</b>	5	There is one small store.
<b>Office</b>	5	Yes.
<b>Rooms equipment</b>	5	There are 22.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	Yes.
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance
<b>Recreational sector</b>	5	There is share the slipway
<b>Aquaculture</b>	0	No relationship

**Table 15 Maximum potential of San Cristóbal cooperative / Máximo potencial de la cooperativa de San Cristóbal**

<b>Category</b>	<b>Infrastructure</b>	<b>Values</b>	<b>Maximum potential</b>
<b>1<sup>st</sup></b>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
<b>2<sup>nd</sup></b>	Travelift	0	15
	Crane	5	
	Forklift	0	
	Ice machine	5	
	Cold storage	5	
<b>3<sup>th</sup></b>	Refrigerated vans	0	25
	Isothermal truck	0	
	1st sale	5	
	Store	5	
	Office	5	
	Rooms equipment	5	
<b>4<sup>th</sup></b>	Fuel tank	5	15
	Fish market	0	
	Restaurant	5	
	Socio-tourism importance	5	
Recreational sector		5	
Aquaculture		0	

**Table 16 Rating infrastructure of San Cristóbal cooperative/ Puntuación de las infraestructuras de la cooperativa de San Cristóbal.**

Infrastructure	Score	Criterion
<b>Port</b>	2	There are small dam and offers little refuge. There is stranding area, equipment rooms and ramp. Accessibility is not correct. The dam is in good condition. There are limitations by weather conditions.
<b>Brotherhood situation</b>	4	Near the grounding area, the room equipments and ramp. The discharge is performed near the 1st sale.
<b>Occupancy rate</b>	5	It was built for the fishing industry and now this sector occupies 100% of the space.
<b>Travelift</b>	0	No
<b>Crane</b>	3	It is in good conditions, but its use is limited only when the weather conditions are good, and then carry out activities of large fish landings and grounding boats.
<b>Forklift</b>	0	No
<b>Ice machine</b>	4	There are two, they only produce when ice is to be used, spent almost everything.
<b>Cold store</b>	5	There is one with a 2 tons fish capacity. Usually it is full of fish.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	2	Capacity of 5,000 liters. Only small boats. The big boats must go to marina of Las Palmas de Gran Canaria which is cheaper. Duration of tank is several months.
<b>1st sale</b>	5	Yes.
<b>Store</b>	5	There are one that always is full
<b>Office</b>	5	There are an office where the meetings take place
<b>Rooms equipment</b>	5	All occupied.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	Currently it is rented.
<b>Socio-tourism importance</b>	2	Village with fishing tradition, but few tourist and commercial attraction
<b>Recreational sector</b>	2	There are several sport boats groundings. It is also used for launching and strand boats.
<b>Aquaculture</b>	0	Are unrelated.

**Table 17 San Cristóbal cooperative efficiency / Eficiencia de la cooperativa de San Cristóbal.**

Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	2	11	11/15=0,73
	Brotherhood situation	4		
	Occupancy rate	5		
2 <sup>nd</sup>	Travelift	0	12	12/15=0,8
	Crane	3		
	Forklift	0		
	Ice machine	4		
	Cold storage	5		
3 <sup>th</sup>	Refrigerated vans	0	22	22/25=0,88
	Isothermal truck	0		
	1st sale	2		
	Store	5		
	Office	5		
	Rooms equipment	5		
4 <sup>th</sup>	Fuel tank	5	9	9/15=0,6
	Fish market	0		
	Restaurant	5		
	Socio-tourism importance	2		
	Recreational sector	2		
	Aquaculture	0		

**Table 18 Melenara Brotherhood equipment /Equipamiento de la cooperativa de Melenara**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security.
<b>Brotherhood situation</b>	5	Scoring is based on the distance of the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	It assesses the current occupancy rate, compared to initial when the port was built
<b>Travelift</b>	5	Yes.
<b>Crane</b>	5	There is 1
<b>Forklift</b>	5	There are 2
<b>Ice machine</b>	5	There is one of 6-8 ton/day.
<b>Cold store</b>	5	There are two, one of maintenance (30-36 m2) and another freezing (6-8 m2).
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	5	There is 1.
<b>Fuel tank</b>	5	There are one of 30,000 liters.
<b>1st sale</b>	5	Providing the service.
<b>Store</b>	5	There are one, the old garage of old travelift.
<b>Office</b>	5	Yes.
<b>Rooms equipment</b>	5	There are 18.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	Yes.
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance
<b>Recreational sector</b>	5	Coexist in the dock, pontoons, equipment grounding and grounding area
<b>Aquaculture</b>	5	According to the amount of services they provide of aquaculture activity.

**Table 19 Maximum potential of Melenara cooperative / Máximo potencial de la cooperativa de Melenara**

<b>Category</b>	<b>Infrastructure</b>	<b>Values</b>	<b>Maximum potential</b>
1 <sup>st</sup>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
2 <sup>nd</sup>	Travelift	5	25
	Crane	5	
	Forklift	5	
	Ice machine	5	
	Cold storage	5	
3 <sup>th</sup>	Refrigerated vans	0	30
	Isothermal truck	5	
	1st sale	5	
	Store	5	
	Office	5	
	Rooms equipment	5	
4 <sup>th</sup>	Fuel tank	5	20
	Fish market	0	
	Restaurant	5	
	Socio-tourism importance	5	
Recreational sector		5	20
Aquaculture		5	

**Table 20 Rating infrastructure of Melenara cooperative / Puntuación de las infraestructuras de la cooperativa de Melenara.**

Infrastructure	Score	Criterion
<b>Port</b>	5	There are a refuge area, pontoons, recycling center, stranding area, equipment room and good accessibility.
<b>Brotherhood situation</b>	4	Remoteness from the discharge area and the first sale. The supply of ice is too far and must be loaded to the vessel, crossing the whole of grounding area.
<b>Occupancy rate</b>	2	Port originally built for fishing but now has led to several uses, including recreation, aquaculture and research. They occupy about 15%.
<b>Travelift</b>	5	Used daily. His state of conservation is good. Both for professionals and sports.
<b>Crane</b>	3	It is used only when great landings of tuna, or vessels engaged in aquaculture was spoiling their cranes.
<b>Forklift</b>	5	It is used daily for professionals, sports and aquaculture. It needs one more
<b>Ice machine</b>	5	There are one of 6-8 tons / day. All ice is spent and many days it takes more.
<b>Cold store</b>	-5	There are two, one for maintenance (30-36 m2) and another for freezing (6-8 m2). Do not use them to store the fish, but to preserve the ice. Sometimes there are a little fish, but it is forbidden to mix the ice and fish. Not used to what was implemented.
<b>Refrigerated vans</b>	0	No
<b>Isothermal truck</b>	4	It is used almost every day to distribute fish.
<b>Fuel tank</b>	5	There is one of 30,000 liters that it is spent daily
<b>1st sale</b>	5	Yes
<b>Store</b>	5	There is one, the old garage from the old travelift. Stored elevators, trucks, boxes and material of the brotherhood.
<b>Office</b>	5	There are offices for administrative tasks.
<b>Rooms equipment</b>	5	They are all occupied and well situated.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	It is currently rented.
<b>Socio-tourism importance</b>	4	It has not a lot of fishing history, but it has a strong commercial interest for aquaculture farms and the ICCM.
<b>Recreational sector</b>	4	Share areas of grounding, machinery and dock.
<b>Aquaculture</b>	5	Share equipment, space, also aquaculture buy the ice, so they have quite relation.

**Table 21 Melenara cooperative efficiency/ Eficiencia de la cooperativa de Melenara.**

Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	5	11	11/15 = 0,73
	Brotherhood situation	4		
	Occupancy rate	2		
2 <sup>nd</sup>	Travelift	5	13	13 /25= 0,52
	Crane	3		
	Forklift	5		
	Ice machine	5		
	Cold storage	-5		
3 <sup>th</sup>	Refrigerated vans	0	29	29 /30 = 0,9667
	Isothermal truck	4		
	1st sale	5		
	Store	5		
	Office	5		
	Rooms equipment	5		
	Fuel tank	5		
4 <sup>th</sup>	Fish market	0	18	18/20= 0,9
	Restaurant	5		
	Socio-tourism importance	4		
	Recreational sector	4		
	Aquaculture	5		

**Table 22 Castillo del Romeral brotherhood equipment / Equipamiento de la cofradía de Castillo del Romeral.**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security
<b>Brotherhood situation</b>	5	Scoring is based on the distance to the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	assesses the present occupancy rate, compared to initial when the port was built
<b>Travelift</b>	0	No.
<b>Crane</b>	5	There is a crane to lift vessels from the water when there are big landings of fish.
<b>Forklift</b>	0	No.
<b>Ice machine</b>	5	There is a machine that produces 500 kg per day.
<b>Cold store</b>	0	No.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	5	There is one of 5,000 liters.
<b>1st sale</b>	5	Providing the service.
<b>Store</b>	0	No.
<b>Office</b>	5	Yes.
<b>Rooms equipment</b>	5	24.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	Yes.
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance
<b>Recreational sector</b>	5	Relationship to the slipway.
<b>Aquaculture</b>	5	Relationship to the slipway.

**Table 23 Maximum potential of Castillo del Romeral brotherhood / Máximo potencial de la cofradía de Castillo del Romeral.**

Category	Infrastructure	Values	Maximum potential
1 <sup>st</sup>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
2 <sup>nd</sup>	Travelift	0	10
	Crane	5	
	Forklift	0	
	Ice machine	5	
	Cold storage	0	
	Refrigerated vans	0	
3 <sup>th</sup>	Isothermal truck	0	20
	1st sale	5	
	Store	5	
	Office	0	
	Rooms equipment	5	
	Fuel tank	5	
4 <sup>th</sup>	Fish market	0	20
	Restaurant	5	
	Socio-tourism importance	5	
	Recreational sector	5	
	Aquaculture	5	

**Table 24 Rating infrastructure of Castillo del Romeral brotherhood/ Puntuación de las infraestructuras de la cofradía de Castillo del Romeral.**

Infrastructure	Score	Criterion
<b>Port</b>	2	The breakwater is small, a small pontoon, it has not a recycling center, old infrastructure, grounding area, not vigilance.
<b>Brotherhood situation</b>	3	It is too far from the dock area. Fish must be transported to the first sale.
<b>Occupancy rate</b>	5	Originally built for fishing, and currently occupies 100% of the space.
<b>Travelift</b>	0	No.
<b>Crane</b>	2	Use the crane to lift boats. Catches are not large enough to use it. It is used once every 15 days.
<b>Forklift</b>	0	No.
<b>Ice machine</b>	2	Spend between 150-250 kg per day.
<b>Cold store</b>	0	No.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	0	Now it is not using for transportation. Diesel is bought at gas diesel station and it is moved in small tanks.
<b>1st sale</b>	5	Yes.
<b>Store</b>	0	There is not, room equipment is used for this
<b>Office</b>	5	There are enough to administrative tasks.
<b>Rooms equipment</b>	4	There are 11 occupied by owners but the owners are not there and they are closed. There are 16 people waiting for a room. Enough <b>space</b> to work.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	It is rented.
<b>Socio-tourism importance</b>	2	There is some fishing tradition. It has no commercial or tourist interest.
<b>Recreational sector</b>	3	Some recreation is at the breakwater or gets their boats there.
<b>Aquaculture</b>	3	Sometimes it is used.

**Table 25 Castillo del Romeral brotherhood efficiency / Eficiencia de la cofradía de Castillo del Romeral.**

Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	2	10	10/15 = 0,667
	Brotherhood situation	3		
	Occupancy rate	5		
2 <sup>nd</sup>	Travelift	0	4	4/10= 0,4
	Crane	2		
	Forklift	0		
	Ice machine	2		
	Cold storage	0		
3 <sup>th</sup>	Refrigerated vans	0	14	14/20= 0,7
	Isothermal truck	0		
	1st sale	0		
	Store	5		
	Office	0		
	Rooms equipment	5		
4 <sup>th</sup>	Fuel tank	4	13	13/20= 0,65
	Fish market	0		
	Restaurant	5		
	Socio-tourism importance	2		
	Recreational sector	3		
	Aquaculture	3		

**Table 26 Arguineguín brotherhood equipment/ Equipamiento de la cofradía de Arguineguín.**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security
<b>Brotherhood situation</b>	5	Scoring is based on the distance to the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	assesses the present occupancy rate, compared to initial when the port was built
<b>Travelift</b>	5	It has one of 70 tons.
<b>Crane</b>	5	There is 1.
<b>Forklift</b>	5	There are 4.
<b>Ice machine</b>	5	There are 3, one of 12 tons and two of 3-4 tons.
<b>Cold store</b>	5	There are two great, one to maintain fresh and one for frozen.
<b>Refrigerated vans</b>	5	There is 1.
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	5	There is a deposit of 40,000 liters.
<b>1st sale</b>	5	Providing the service.
<b>Store</b>	5	There is one next to the first sale place
<b>Office</b>	5	Yes
<b>Rooms equipment</b>	5	There are 41.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	It is renta
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance
<b>Recreational sector</b>	5	Coexist in the dock, pontoons, and ramp and of stranding area.
<b>Aquaculture</b>	0	There are unrelated.

**Table 27 Maximum potential of Arguineguín brotherhood/ Máximo potencial de la cofradía de Arguineguín.**

<b>Category</b>	<b>Infrastructure</b>	<b>Values</b>	<b>Maximum potential</b>
1 <sup>st</sup>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
2 <sup>nd</sup>	Travelift	5	25
	Crane	5	
	Forklift	5	
	Ice machine	5	
	Cold storage	5	
3 <sup>th</sup>	Refrigerated vans	5	30
	Isothermal truck	0	
	1st sale	5	
	Store	5	
	Office	5	
	Rooms equipment	5	
4 <sup>th</sup>	Fuel tank	5	15
	Fish market	0	
	Restaurant	5	
	Socio-tourism importance	5	
	Recreational sector	5	
	Aquaculture	0	15
		0	

**Table 28 Rating infrastructure of Arguineguín brotherhood/ Puntuación de las infraestructuras de la cofradía de Arguineguín.**

Infrastructure	Score	Criterion
<b>Port</b>	5	There are breakwater, pontoons, recycling center, water / light, grounding area, ramp, good accessibility, good general condition of dam and vigilance.
<b>Brotherhood situation</b>	5	It is near the discharge area, provides directly to the ship as gasoline and ice.
<b>Occupancy rate</b>	4	It was initially built for fishing industry. It has evolved and today they occupy 30-40%.
<b>Travelift</b>	2	It is used by professional and sport. A little rusty. Use 1-2 times per week.
<b>Crane</b>	3	It is mostly used in large catches. A little rusty.
<b>Forklift</b>	2	It use 1 or 2 times per day.
<b>Ice machine</b>	3	There are 3, one of 12 tons and two of 3-4 tons. The 12 tons is used in full and occasionally one of small.
<b>Cold store</b>	4	There are two big, one to keep the fish fresh and the other for frozen fish. There are not usually full.
<b>Refrigerated vans</b>	-5	Do not use it because the fish cannot sold
<b>Isothermal truck</b>	0	No.
<b>Fuel tank</b>	4	Only use 15000-20000 liters per month.
<b>1st sale</b>	5	Yes.
<b>Store</b>	5	Used to store the vans, forklifts, material of the brotherhood.
<b>Office</b>	5	For administrative tasks.
<b>Rooms equipment</b>	4	There are enough but far from the fishing area and little space.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	It is rented.
<b>Socio-tourism importance</b>	4	It has fishing tradition. There are commercial activities like the boat that connects Mogán-Puerto Rico-Arguineguín. The presence of tourism is largely due to those who bring these boats.
<b>Recreational sector</b>	5	Coexist in the pontoons, in the grounding area and the use of travelift.
<b>Aquaculture</b>	0	There are unrelated.

**Table 29 Arguineguín brotherhood efficiency / Eficiencia de la cofradía de Arguineguín.**

Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	5	14	13/15 = 0,933
	Brotherhood situation	5		
	Occupancy rate	4		
2 <sup>nd</sup>	Travelift	2	14	15/25= 0,56
	Crane	3		
	Forklift	2		
	Ice machine	3		
	Cold storage	4		
3 <sup>rd</sup>	Refrigerated vans	-5	18	18/30 = 0,6
	Isothermal truck	0		
	1st sale	4		
	Store	5		
	Office	5		
	Rooms equipment	5		
	Fuel tank	4		
4 <sup>th</sup>	Fish market	0	14	14/15 = 0,93333
	Restaurant	5		
	Socio-tourism importance	4		
	Recreational sector	5		
	Aquaculture	0		

**Table 30 Mogán brotherhood equipment/ Equipamiento de la cofradía de Mogán.**

Infrastructure	Maximum score	Criterion
<b>Port</b>	5	Scoring is based on: providing shelter, dock size, pontoons, spot clean, stranding area, ramp, dock status, accessibility and security
<b>Brotherhood situation</b>	5	Scoring is based on the distance to the discharge area, stranding and offices.
<b>Occupancy rate</b>	5	assesses the present occupancy rate, compared to initial when the port was built
<b>Travelift</b>	5	There is 1.
<b>Crane</b>	5	There are 2.
<b>Forklift</b>	5	There are 3.
<b>Ice machine</b>	5	There are 2.
<b>Cold store</b>	5	There are 2.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	5	There is 1.
<b>Fuel tank</b>	5	There is one of 13,000 liters.
<b>1st sale</b>	5	Providing the service.
<b>Store</b>	5	There is 1.
<b>Office</b>	5	Yes.
<b>Rooms equipment</b>	5	There are 23.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	Yes.
<b>Socio-tourism importance</b>	5	Scoring is based on the cultural, tourist and commercial importance.
<b>Recreational sector</b>	5	Coexist in the dock, pontoons, ramp and grounding area.
<b>Aquaculture</b>	0	There are unrelated.

**Table 31 Maximum potential of Mogán brotherhood / Máximo potencial de la cofradía de Mogán.**

Category	Infrastructure	Values	Maximum potential
1 <sup>st</sup>	Port	5	15
	Brotherhood situation	5	
	Occupancy rate	5	
2 <sup>nd</sup>	Travelift	5	25
	Crane	5	
	Forklift	5	
	Ice machine	5	
	Cold storage	5	
3 <sup>th</sup>	Refrigerated vans	0	30
	Isothermal truck	5	
	1st sale	5	
	Store	5	
	Office	5	
	Rooms equipment	5	
4 <sup>th</sup>	Fuel tank	5	15
	Fish market	0	
	Restaurant	5	
	Socio-tourism importance	5	
	Recreational sector	5	
	Aquaculture	0	

**Table 32 Rating infrastructure of Mogán brotherhood/ Puntuación de las infraestructuras de la cofradía de Mogán.**

Infrastructure	Score	Criterion
<b>Port</b>	5	There is a large port. It has pontoons, water / light, grounding area, equipment room, ramp.
<b>Brotherhood situation</b>	5	Located near the pier. The discharge point is near at the first sale. All services concentrated in the brotherhood.
<b>Occupancy rate</b>	3	It was built for the fishing and sport sector. Currently the fishing industry uses 15% of space.
<b>Travelift</b>	4	It use between 3-4 times per week. Only for professionals.
<b>Crane</b>	2	There are two. Only when there are large catches. A little rusty.
<b>Forklift</b>	4	There are 3. Not used 100%, but often.
<b>Ice machine</b>	3	There are two; one is 30 tons and other of 5 tons. When there are tuna is used at 100%, the rest of the year 30-40%.
<b>Cold store</b>	3	They are used regularly.
<b>Refrigerated vans</b>	0	No.
<b>Isothermal truck</b>	4	There is one, using between 3-4 times per week.
<b>Fuel tank</b>	5	A tank of 13,000 liters. Ships will refuel daily.
<b>1st sale</b>	5	Yes.
<b>Store</b>	5	To save material of the brotherhood and the first sale.
<b>Office</b>	5	Everything necessary for administrative tasks.
<b>Rooms equipment</b>	4	There are 19 occupied.
<b>Fish market</b>	0	No.
<b>Restaurant</b>	5	It is rented.
<b>Socio-tourism importance</b>	5	There are traditional fishing village, tourist and commercial importance as there are charter companies, fishing, visiting whales, submarine, diving, transport between Arguineguín and Puerto Rico.
<b>Recreational sector</b>	5	Great recreational activity, using the area of grounding, the ramp and pontoons.
<b>Aquaculture</b>	0	There are unrelated.

**Table 33 Mogán brotherhood efficiency / Eficiencia de la cofradía de Mogán.**

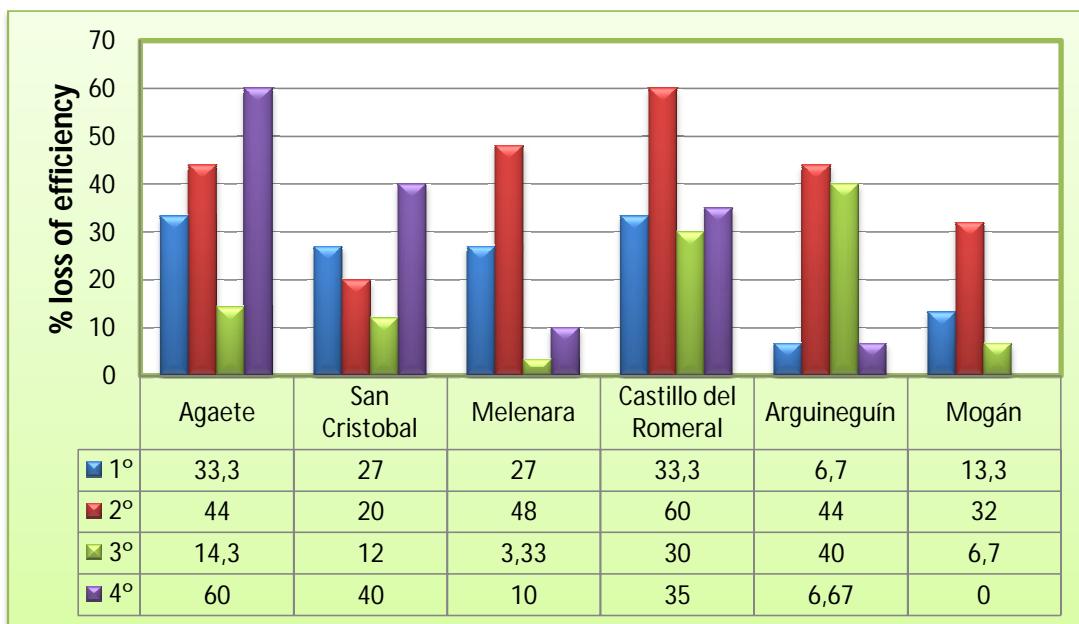
Category	Infrastructure	Values	Use level	Efficiency index
1 <sup>st</sup>	Port	5	13	13/15=0,867
	Brotherhood situation	5		
	Occupancy rate	3		
2 <sup>nd</sup>	Travelift	4	17	17/25= 0,68
	Crane	2		
	Forklift	4		
	Ice machine	3		
	Cold storage	3		
3 <sup>th</sup>	Refrigerated vans	0	28	28/30= 0,9333
	Isothermal truck	4		
	1st sale	5		
	Store	5		
	Office	5		
	Rooms equipment	5		
	Fuel tank	4		
4 <sup>th</sup>	Fish market	0	15	15/15= 1
	Restaurant	5		
	Socio-tourism importance	5		
	Recreational sector	5		
	Aquaculture	0		

On the basis of all the previous data a summary table has been built to show all efficiency ratios for each brotherhood and for each category (Table 34). Once obtained these indices and the catches of each brotherhood a loss efficiency graph has been built (Fig. 4), in order to compare the different brotherhoods, depending on the use of their infrastructure and their catches.

**Table 34 Summary efficiency indexes / Resumen de los índices de eficiencia**

Brotherhood / Cooperative	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>th</sup>	4 <sup>th</sup>
<b>Agaete</b>	0,667	0,56	0,857	0,4
<b>San Cristóbal</b>	0,73	0,8	0,88	0,6
<b>Melenara</b>	0,73	0,52	0,9667	0,9
<b>Castillo del Romeral</b>	0,667	0,4	0,5	0,65
<b>Arguineguín</b>	0,933	0,56	0,6	0,9333
<b>Mogán</b>	0,867	0,68	0,933	1

**Fig. 4 Loss of efficiency of the brotherhoods / Pérdida de eficiencia de las cofradías.**



Analyzing major infrastructure (category 1), the entities less efficient are brotherhoods of Agaete, San Cristóbal, Melenara and Castillo del Romeral, while the more efficient are Arguineguín and Mogán. In the case of the last two, the cause or their higher efficiency lies in good conditions of ports and equipment of the brotherhoods. In the case of the cases of San Cristóbal and Castillo del Romeral is the poor condition of the breakwater and the few facilities that can be offered to fishermen. However, the element less efficient in all ports is related to the use of all machinery directly related to fishing (category 2). In general, its use is not very efficient in all ports. In Castillo del Romeral, the few infrastructures that it has are far below its capacity, because although it has little machinery, its use is inefficient due to poor facilities design. The case of Arguineguín and Puerto de Mogán, these are dimensioned according to the seasonal tuna fishery, with catches very variable, while the rest of the year the levels of use of their handling and storage capacities of fishing are significantly lowest due to reduced catch bento-demersal. In this sense, the corporation more efficient, in relation to the available infrastructure, is San Cristóbal dimensioned to constant catches values, not

dependent on tuna fishing, with a maximum use of their facilities. In Agaete, the inefficiency is given by the rare use of the available infrastructure, very oversized, with part of its machinery below the 50% of its capacity. In Melenara, despite the fact that part of the machinery are at 100% of its capacity, others are below its potential uses and even is being used for other activities outside fishing result of its acquisition, as is the case of the cold chambers, primarily intended to conserve ice.

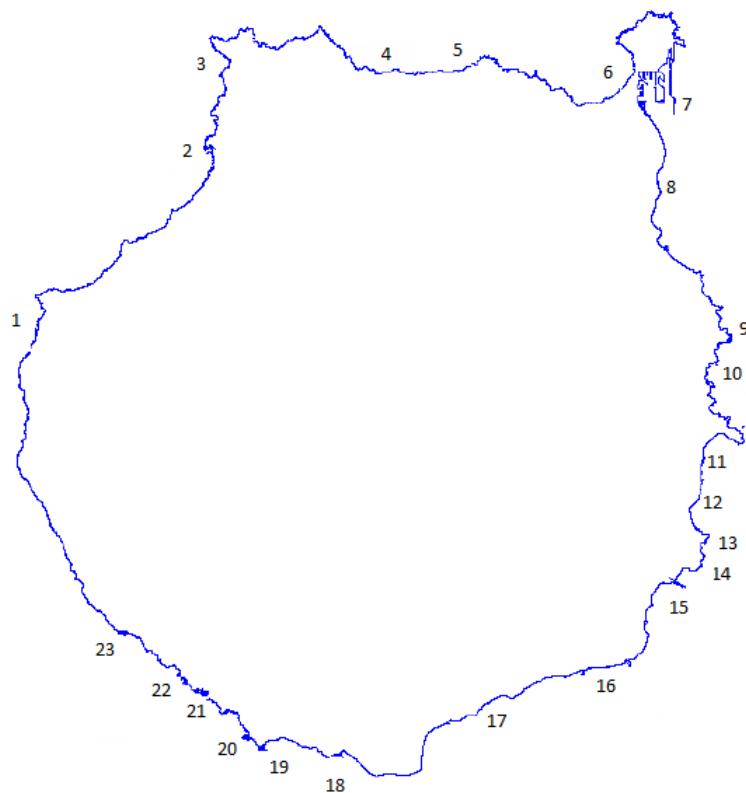
The 3<sup>rd</sup> category encompasses the facilities that fishermen have in the port. The Arguineguín brotherhood is the most inefficient in part by the infrastructures that are not being used for the committed that they were planted. On the other hand, in relation to 4<sup>th</sup> category (economic possibilities of the brotherhood and peaceful coexistence with other economic sectors), Mogán is the only brotherhood totally efficient, as they have been developed together with the recreational sector and tourism. However, it is this aspect Agaete, San Cristóbal and Castillo del Romeral are the less effective, possibly by the low empowerment of socio-cultural industry and tourism in these locations, or by the low collaboration with the recreational sector and aquaculture. This last aspect is much enhanced in Melenara.

But there are not only infrastructures dedicated to fishing in ports and harbors described, since in Gran Canaria there are many other points (Fig. 5, Table 36) with smaller ports, breakwaters, anchorages, ramps or beaches (Fig. 35), where there are a high activity of recreational craft that they exercise fishing activity, mostly seasonal, and where the availability of infrastructure and accessibility is very heterogeneous (Table 37).

**Table 35 Classification of professional and recreational fishing points on the island / Clasificación de los puntos de actividad pesquera profesional y recreativa de la Isla.**

Port	Breakwater	Ramp	Anchorage	Beach
Agaete	La Aldea	El Altillo	Peña La Vieja	EL Puertillo
Club Náutico de Las Palmas	Sardina	Arinaga (Risco Verde)	Las Alcaravaneras	La Puntilla
Muelle Deportivo de Las Palmas	San Cristóbal		Tufia	Ojos de Garza
Taliarte	Arinaga (pueblo)			El Burrero
Pasito Blanco	Arinaga (muelle)			El Cabrón
Arguineguín	Castillo del Romeral			Playa del Águila
Muelle Deportivo de Anfi del Mar				El Pajar
Muelle Deportivo de Puerto Rico				
Mogán				

**Fig. 5 Distribution of areas with vessels and infrastructures of Gran Canaria /Distribución de las zonas con embarcaciones e infraestructuras de Gran Canaria.**



**Table 36 List of the different boats and infrastructure areas of Gran Canaria / Enumeración de las distintas zonas con embarcaciones e infraestructuras de Gran Canaria.**

Nº	Site	Nº	Site	Nº	Site
1	La Aldea	9	Taliarte	17	Playa del Águila
2	Agaete	10	Tufia	18	Pasito Blanco
3	Sardina del Norte	11	Ojos de Garza	19	El Pajar
4	El Altillo	12	El Burrero	20	Arguineguín
5	El Puertillo	13	El Cabróñ	21	Anfi del Mar
6	Peña La Vieja	14	Arinaga (Risco Verde)	22	Puerto Rico (Puerto Escala y Puerto Base)
	La Puntilla		Arinaga (pueblo)		
7	Club Náutico	15	Arinaga (Muelle)	23	Mogán
	Las Alcaravaneras				
	Muelle d Deportivo de L.P.				
8	San Cristóbal	16	Castillo del Romeral		

**Table 37 Description of infrastructure and vessels in various areas of the island/ Descripción de las infraestructuras y embarcaciones en los distintos puntos de la Isla.**

Site	Boats		Infrastructures	Characteristics
	Professional	Recreational		
La Aldea	3	20-30	Breakwater Ramp Grounding area Anchorage	It has the old Pescaldea infrastructure, now closed. Boats can access by the ramp
Agaete	28	121	Breakwater Pontoon Ramp Grounding area Recycling center Crane Travelift Pit	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted
Sardina del Norte	2	30	Breakwater Ramps Grounding area Anchorage	The number of ships depending on the season and sea conditions. Entry and exit of boats up the ramp.
El Altillo	None	None	Ramp	There is only one ramp. Difficult access, as there is no breakwater and ramp is exposed to waves. Hardly used
El puertillo	None	15-20	-	All boats are on the sand and they are small. Possibility to put boats on the sand.

<b>Peña la Vieja (Las Canteras)</b>	None	5-8 on the sand 5-10 in the water	Anchorage	There are not possibilities to car access to put or take out boats.
<b>La puntilla (Las Canteras)</b>	-	30-40 on the sand 15-20 in the water 5-10 near to "La Marinera" restaurant	Anchorage Ramp Grounding area	Most boats are small, not reaching to 4 meters.
<b>Club Náutico de Las Palmas</b>	None	120-140	Ramp Pit Travelift Grounding area Breakwater Pontoon Water / Light Crane Recycling center Showers and toilets	Many of the boats are a sailing ship.
<b>Fondeadero de Las Alcaravaneras</b>	None	20-30	Anchorage	Sailboats rest few days Maintenance work that they need are performed in the marina.
<b>Muelle Deportivo de Las Palmas de Gran Canaria</b>	None	1.187	Breakwater Ramp Grounding area Pit Travelift Fuel Recycling center Pontoon Water / Light Showers and toilets	Nearby there are shops dedicated to selling nautical equipment and repairs. The boats can access by ramp.
<b>San Cristóbal</b>	9	15	Breakwater Ramp Crane Grounding area Recycling center	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted
<b>Taliarte</b>	18	160	Breakwater Ramp Pit Grounding area Travelift Recycling center Pontoon Fuel	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted
<b>Tufia</b>	None	15-25	Anchorage Ramp	They Just enter and leave which are in the sand.
<b>Playa Ojos de Garza</b>	None	4-8	-	Just enter and leave which are in the sand.
<b>El Burrero (playa)</b>	3	8-12	Equipment rooms	Boats access by sand

<b>El Cabrón</b>	None	2-6	-	Basically in holiday periods. Only the local boats.
<b>Arinaga (Risco Verde)</b>	None	-	Ramp	Small ramp. The infrastructures use is almost nil, because cars cannot go along the promenade.
<b>Arinaga (pueblo)</b>	None	-	Breakwater Ramp	Boats can get both the ramp and through the sand. Can be approximated to 30 the number of boats that use this beach.
<b>Arinaga (muelle)</b>	2	None	Storage Winche for grounding	
<b>Castillo del Romeral</b>	20	42	Breakwater Ramp Crane Recycling center Grounding area	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted
<b>Playa del Águila</b>	None	2-4	Small storage	Boats access by sand. Only local boats.
<b>Pasito Blanco</b>	None	388	Breakwater Pontoon Pit Travelift Water/ Light Grounding area Fuel Crane Recycling center Showers and toilets	They are currently at 97% of their capacity. They tend to be so throughout the year. Nearby are nautical shops and ship repairs. Possibility of putting in and taking boats down the ramp.
<b>El Pajar</b>	None	15-25 in the beach near to “El Boya” restaurant 4-8 in the water 5-10 the beach at the back	Anchorage Access by car on the beach at the back	Access difficult to get boats on the beach.
<b>Arguineguín</b>	60	171	Breakwater Ramp Grounding area Travelift Pit Fuel Recycling center	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted
<b>Muelle Deportivo Anfi del Mar</b>	None	89	Pontoons Water/Light Recycling center Ramp Shower and toilets	Possibility of putting in and taking boats down the ramp.

<b>Puerto Rico</b>	<b>Escala</b>	None	220	Breakwater Pontoon Fuel Water/Light Travelift Grounding area Ramp Shower and toilets Recycling center	Around this dock there is great commercial activity. It is also a stop on the route linking Mogán-Puerto Rico-Arguineguín. There are activities of fishing, diving, boating, jet skis, etc. Possibility of putting in and taking boats down the ramp.
	<b>Base</b>	None	340		
<b>Mogán</b>		21	216	Breakwater Ramp Grounding area Travelift Pit Fuel Recycling center	In these infrastructures have been placed the infrastructures for recreational sector, and the fishing industry and brotherhood have been omitted

It is estimated that in Gran Canaria there are approximately 3,385 recreational boats (Table 37) distributed in various ports, docks sports, anchorages, etc., away from the 7,162 boats in 7<sup>th</sup> list and 241 in 6<sup>th</sup> list counted in 2005 (MAPyA, 2006; Anónimo, 2011). This part of the sport fleet that is not associated with mooring infrastructure that is composed mainly by small boats, mostly built in fiberglass and about 3 m in length, they are extracted from water with the help of trailers and stored in garages after each fishing day.

Of this total of vessels, 43.4 % are those involved in recreational fishing (MAPyA, 2006). Knowing that the Gran Canaria island has a coastline perimeter of 242 km, we find a density of 14 boats per coastline kilometer (this density increases to 29.59 boats/km if it is taken as a reference the total recreational boats registered, 7,162 ).

This high number of ships is reflected also in a high number of fishing licenses, since in 2005 had a total of 5,699 licenses issued in Gran Canaria and 16,237 licenses throughout the Canary Islands. This implies that Gran Canaria supports the 35.1 % of the total of the licenses of the Canary Islands (Table 38), so with this in mind it has been

estimated the same contribution to April 2011, where there were in the Canary Islands 96,217 licenses, so in Gran Canaria is estimated that there are currently around 33,772 fishing licenses (Table 39).

In the Canary Islands, by good weather conditions that have, it offers good opportunities for fishing, which is why more than half of the recreational fishermen practicing this activity throughout the year, to suffer increased in summer and spring (Fig. 6).

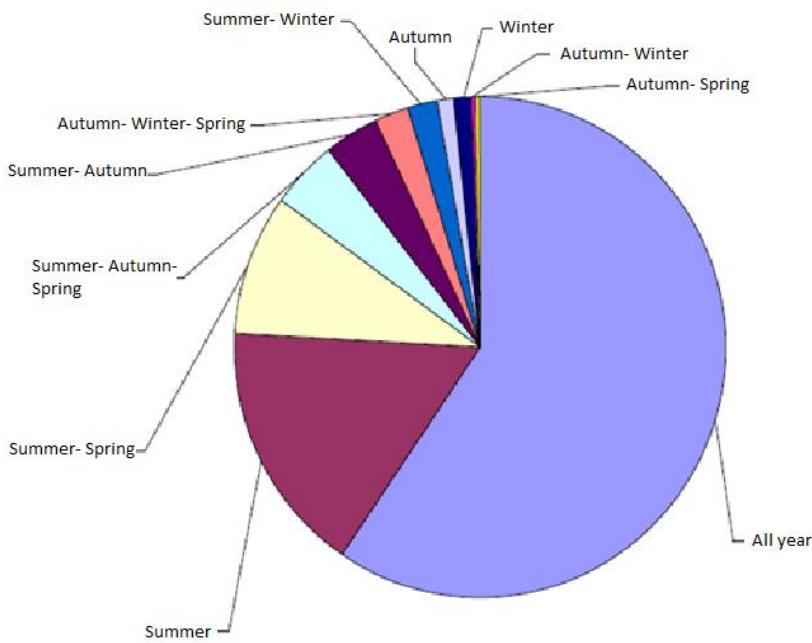
**Table 38 License number in Gran Canaria in 2005 (Source: MAPyA, 2006)/Nº de licencias en Gran Canaria en 2005 (Fuente: MAPyA, 2006)**

Island	2005	Contribution (%)
Gran Canaria	5.699	35,10
Fuerteventura	1.576	9,71
Lanzarote	1.137	7,00
Tenerife	6.396	39,39
El Hierro	391	2,41
La Gomera	286	1,76
La Palma	755	4,65
Total	16.237	

**Table 39 1 License number by class in 2008, 2009, 2010 and april 2011 (Source: Consejería de Agricultura, Ganadería, Pesca y Medio Ambiente, 2011) / N° de licencias por clase en 2008, 2009, 2010 y abril de 2011(Fuente: Consejería de Agricultura, Ganadería, Pesca y Medio Ambiente, 2011)**

Class/year	Canary Island				Gran Canaria Contribution = 35,10%
	2008	2009	2010	april-11	
1 <sup>st</sup>	504	805	530	1.839	645
2 <sup>nd</sup>	1.132	1.688	1.329	4.149	1.456
3 <sup>th</sup>	18.071	32.332	29.295	79.698	27.974
1 <sup>st</sup> y 3 <sup>th</sup>	1.567	3.040	2.235	6.842	2.402
2 <sup>nd</sup> y 3 <sup>th</sup>	633	952	880	2.465	865
1 <sup>st</sup> y 2 <sup>nd</sup>	29	51	38	118	41
1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>th</sup>	258	496	352	1.106	388
<b>Total</b>	<b>22.194</b>	<b>39.364</b>	<b>34.659</b>	<b>96.217</b>	<b>33.772</b>

**Fig. 6 Recreational fishing season in Canary Islands (Extracted: MAPyA, 2006) /Temporada de pesca recreativa en Canarias (Extraido: MAPyA, 2006)**



#### **4. Discussion:**

The infrastructure evolution has been developed significantly in the last decades, trying to adapt to the current situation and implementing increasingly new technologies. But this evolution has not been commensurate with the resources exploitation level (in 1986 the Ley de Pesca en Canarias believed that most resources were in overfishing), leaving it to one side and tending increasingly to increase the fishing power. In the last 25 years have developed large infrastructures dedicated to support this sector, it has increased the capacity of the ships while part of the fleet has been renewed, both in terms of engines, incorporation of auxiliary machinery (e.g. winches, haulers, etc.) and technology (e.g. sensors, GPS, ...), in addition to incorporating more equipment in the ports (cold chambers, ice factories, elevators, etc.). The conditions for the maintenance of the boats, installing travelift or cranes have been improved. However, as it was

expected by the starting position, this increase in fishing power (on ships and infrastructure) in last 25 years has not led paired an increase in catches, but has merely succeeded in the best of cases maintain the same levels (they have fallen in Mogán) to a higher cost.

However, the fleet extractive potential is not only had to be measured in number of vessels, power, GRT, sailors,... as the infrastructures that attend the fishing in one way or another also plays a fundamental role in the fishing power and the ability to convert the fishing power in effective effort. The maneuverability, the loading and unloading processes, conservation systems and sanitary control, accessibility by road and marketing facilities of fishery products, and technical assistance for equipment repairs, accommodation of gear and refuge for the boats are crucial aspect that increase the power of fishing in a very significant way. These infrastructures in land that makes the difference the fishing power between the developed countries and in developing, regardless of fishing grounds wealth on which affect. Each time there are more and more strict sanitary controls, conservation methods, transport and handling of fishery products, what is becoming more necessary infrastructure more scientifically and costly, in many cases they are oversized to the appropriate level of catch that can withstand the stocks objectives of the mining activity. By comparison, the existing infrastructure in 1984 (Table 7) were far below, in number, size and sophistication of the current. The Puerto de la Luz y de Las Palmas was the facility that had more infrastructures, because here also landed catches from third countries, principally from the industrial fleet which fished in the Canary-Saharan Banks (Bas et al., 1995; Gafo et al., 1984). The other five zones of the island where fishing activity concentrated in neritic waters were poorly developed in the early 1980 (Table 7), but still they had already overfished situation, as

reflected in the preamble of the fisheries act of the Canaries which was promulgated in 1986 (Barrera-Luján, 2011).

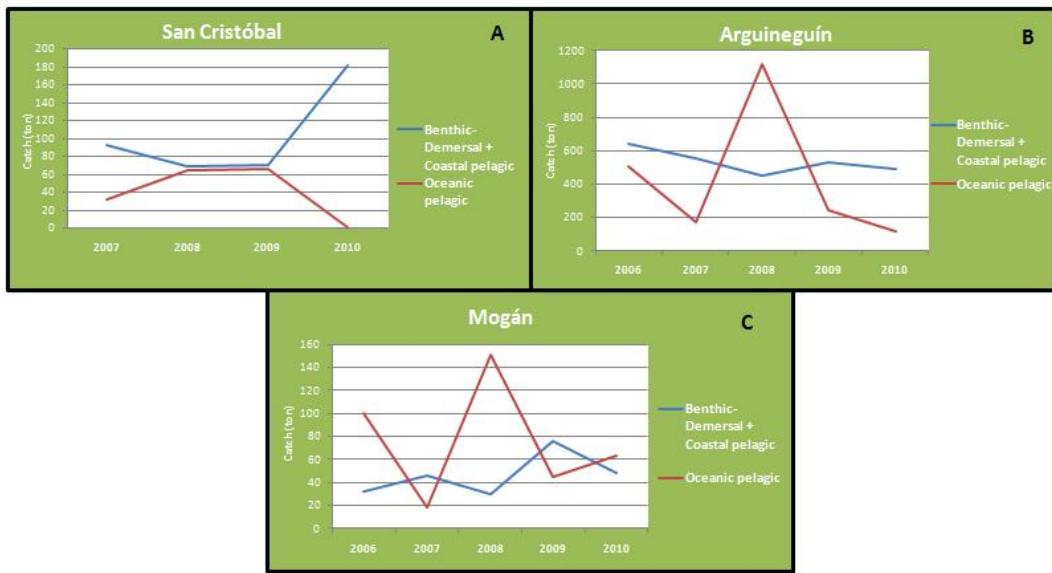
At the beginning of the 1980s, most of the discharge ports just had a breakwater (Agaete, Arguineguín and Mogán), or simply the work was carried out from a beach (San Cristóbal and Castillo del Romeral), taking that beaching the boats at the end of each day. The only technology that possessed by the ship was the engine and all the work is carried out by hand, in both the fisheries and in the fish discharge. But curiously, the infrastructure investment, equipment and technology (Table 8) has not meant an increase in catches or the number of vessels in the fleet, although it has increased the fishing capacity (measured in GRT) and in the power of fishing. All this mess is a clear indication of the inability to assess the situation by competent authorities, as they have not known adapt the dimension of this sector (professional and recreational) to the biomass surplus that could generate the stocks of fishing interest species. It has been wished to promote by all sides, and unfortunately still continues, a primary sector (artisanal fisheries) and another tertiary (recreational fisheries) unanalyzed previously the carrying capacity of the marine ecosystems and their populations to the harvesting pressure exerted, without establishing a planning in the short, medium or long-term, the extractive levels adequate and establishing measures to temper the impact of this activity.

Since 1984, infrastructure investment has been very high, not only by the construction of new ports, such as San Cristóbal, where there was no breakwater, but also by the remodeling almost complete who have suffered other ports, such as that of Agaete or Mogán. In other points, the construction investment of ports has been smaller, as is the case of the Castillo del Romeral. The Arguineguín quay remains practically unchanged, except strengthening works outside or elevation of the carapace of the dam.

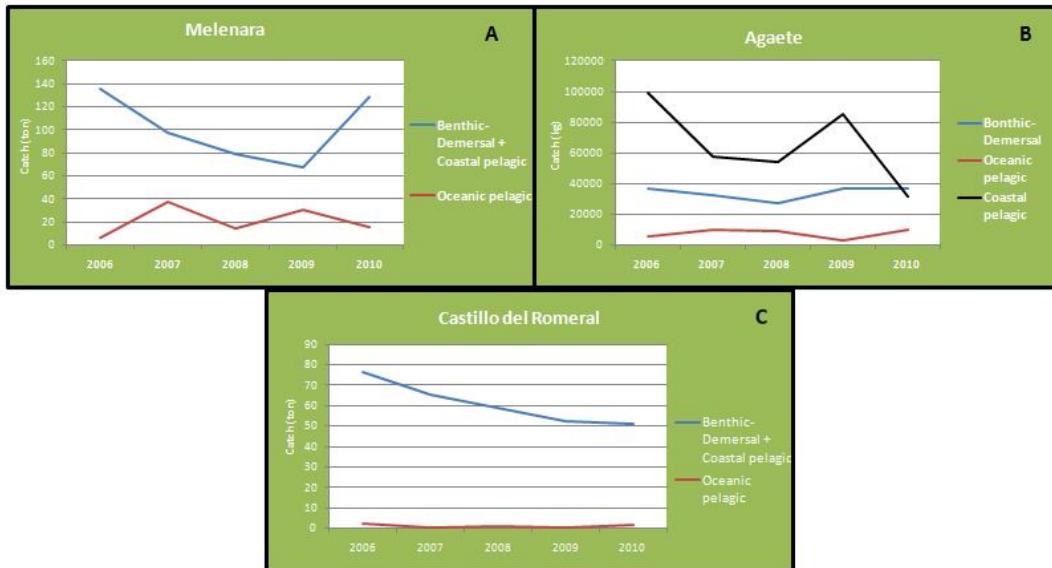
In terms of machinery (cranes, travelift, etc.) and services (offices, stores, etc.), there has been much progress and virtually all the brotherhoods are equipped. So, overall we can say that the level of infrastructure to support fishing in Gran Canaria is raised to have six control points and record catches (first sale) with an important provision of facilities, but operating well below their possibilities or even stops. Curiously the breakthrough in terms of infrastructure and little evolution of catches, as they have not increased in proportion to infrastructure and fishing power.

Much of the fishing strategy of the Island has been based on the seasonal tuna fisheries, with large volumes of capture and significant income for the fisheries sector through the export, being the fishing of species bento-demersal almost a matter of livelihoods (Bas et al., 1995). Possibly, these levels of extraction have conditioned much the current design and dimensioning of the artisanal fishing sector. However, the fall repeatedly and sudden catch levels for various reasons (state of the stocks, environmental issues or simply drop in demand) have led to all the power of fishing that was created around these fishing opportunities have been diverting progressively toward the species bento-demersal and pelagic-coastal, accentuating the overexploitation situation (REPESCAN, 2008) and the decline of the primary sector. This relationship between the tuna fishing and bento-demersal fishing, this leads to lie to exploit more to the bento-demersal when there is no catches of tuna (Fig. 7 and 8). In this over-sizing of the artisanal fisheries sector must be added the excessive growth of recreational fishing industry, with over 96,000 licenses in 2011, may be accentuating the impact on bento-demersal resources. So much so that in 2005, with 16,200 licenses, MAPyA (2006) estimated that the extraction capacity of this sector was around 40% of the total catch, and Jimenez-Alvarado (2010), from the same number of licenses, estimated that power extraction in Gran Canaria was 56% of the total catch.

**Fig. 7 Evolution of the benthic-demersal, coastal pelagic and oceanic pelagic catches in San Cristóbal (A), Arguineguín (B) and Mogán (C) / Evolución de las capturas de bento-demersales, pelágicos costeros y pelágicos oceánicos en San Cristóbal (A), Arguineguín (B) y Mogán (C)**



**Fig. 8 Evolution of the benthic-demersal, coastal pelagic and oceanic pelagic catches in Melenara (A), Agaete (B) y Castillo del Romeral (C)/ Evolución de las capturas de bento-demersales, pelágicos costeros y pelágicos oceánicos en Melenara (A), Agaete (B) y Castillo del Romeral (C)**



Not only influences the amount of infrastructure present in a port, but is also a determining factor its use, as for investments to the placement or modernization is going to depend on their profitability, and in many cases is not used the logic to implement a new machinery or service.

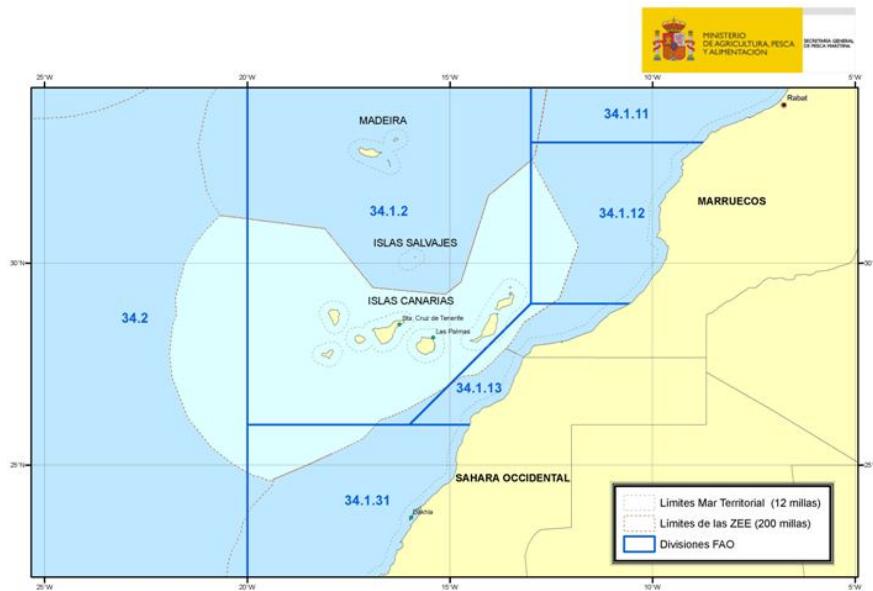
The brotherhoods over-sizing is given by a policy of subsidies, in many cases inconsistent with the stocks overexploitation situation (REPESCAN, 2008), where it has been awarded more the pander to those which make up the sector to establish management and control measures aimed at the sustainability of the fishery resource. The current structuring and dimensioning of the fishing industry, both artisanal and sports, is unsustainable. Perhaps the most visible is the economic sustainability of the brotherhoods, taking in many cases to rely on subsidies even to pay for water and light, and possibly situation of chronic deficit that leads to much of the equipment and crews stops can be found or medium functioning. From 2007, with the arrival of the current economic crisis, this situation has been further aggravated, and the totality of the brotherhoods has established as a strategy for survival outsourcing services (Table 9) and savings mainly by reducing costs of water and light. Unfortunately, this savings strategy has also resulted in a significant reduction in the maintenance of equipment, becoming less efficient. In Gran Canaria, reliance on subsidies by the brotherhoods is a reality, with the exception of San Cristóbal, where they advocate not to ask for subsidies, subsisting thanks to not having a staff hired, controlling the costs of water and light, and the self-management of the machinery, both by issues of maintenance and management.

All brotherhoods presented similar expenses (water, light, insurance and maintenance of machinery), furthermore, except in San Cristobal, also the derivatives of the staff mostly administrative. Other sources of income are also similar (rental of restaurant, recovery of the canon of capture except in Mogán, the provision of stranding to sport boats, in addition to the needy subsidies except San Cristóbal). However, although there is some disparity into account the efficiency of each of these associations in establishing a reasonable use of infrastructure and equipment to which

each one has access (Tables 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32), most of them currently are oversized, well above their actual fishing possibilities (Tables 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33).

An important role in the fishermen's organizations is to provide information on the catch and effort invested, so the Administration to carry out the corresponding assessments of the state of the stocks. Unfortunately, in Gran Canaria none of the brotherhoods has been generating routinely a series of data to ensure that the work, possibly as a result that the Administration has not made a sufficient effort to carry out this process logical and necessary. Only from the year 2006 in the brotherhoods, through the points of first sale, it began to collect information on the landings, although sometimes failures occur at the identification of the species to which it is assigned these values (Martínez-Saavedra, 2011). Unfortunately, this failure is due to a lack of prior training on the part of the competent Administration in this area, and a lack of professionalism in making vital data for the assessment and management of the exploited stocks. In regard to the information collected on the sales notes, is insufficient, because the only thing being annotated is the species, with their scientific name and common name, the kilograms captured, the buyer and seller data, and the fishing area (FAO 34.1.2 that encompasses all the Canary Islands (Fig. 9)), which already comes default software implanted. These issues are not imputable to brotherhoods members, so they simply fill in the implemented chips. This fact is further proof of the inefficiency on the part of the Administration, so it does not allows to annotate relevant data by a subsequent resources management, as it would be more accurate on data catches, gear used, time spent, the expenditure of fuel... Fact which suggest one again the lack of will and inability to perform any management on the island resources.

**Fig. 9 FAO areas (Extracted: MAPyA, 2006) / Zonas FAO (Extraído de MAPyA, 2006)**



The coastline fishing activity has always maintained a relationship with the tourism, so it has become a competitor for the spaces, labor and capital. However, it has also expanded the market for fishery products, and it has encouraged in some localities the same fishermen's families combine income of both sectors through the restaurants management, apartments, ... The combination of activities could result in a decrease of the effort on demersal species, also collaborating with the financing of the bigger boats in the moments of shortage of tuna if possible to use these boats for a certain type of sea excursions. Activities such as fishing-tourism, exhibitions on fishing in the Canary Islands or visits to see how to fish discharge, could be alternative sources, which could help reduce the effort and try to diversify the sector, and not be so dependent nor fishing or grants.

On the island, professional fleet is not the only one which has a bearing on the fishery resources, since on the Island, the recreational sector has much more power and there are large number of docks and anchorages where are located a large number of recreational boating, with a significant impact on fishery resources (Jiménez de

Alvarado, 2010). For many years it was thought that the overexploitation of fish stocks was due solely to professional fishermen, but it has been seen that recreational fishing or sport also has a great impact on the reduction of the fish stocks and invertebrates (Cooke and Cows, 2006). Recreational fishing may have a similar impact on the stocks and ecosystems as professional fishing (Hall, 1999; Coll et al. , 2004; Lewin et al. , 2006) and in some areas can extract a higher fraction of catches, which the professional fleet (Kearney, 1999; McPhee and Skilleter, 2002; MaPhee et al. , 2002). At global level it is estimated that the catch taken by sport fishermen exceeds two million tons (Cowx, 1999). For example in United States, recreational fishing is 25% of the annual catches of some more vulnerable species (Cooke and Cowx, 2004), while in Mexico, in 2002, the recreational catch accounted for 64% of the total obtained the most endangered species (Owen, 2004). Specifically, in Canary Islands, the MAPyA (2006) estimated that in 2005 the contribution of recreational fishing to the total catch was around 40% of the total of the catches.

In this context, we cannot despise the impact that the sector of recreational fishing may be tending on the fishery resources of the Island. Thus, in 2005, in Canary Islands there were a total of 16,237 licenses, 5,699 of which belonged to persons resident in Gran Canaria (Table 38). In 2011 the total number of licenses in the Archipelago amounts to 96,217.

These 96,000 licenses must be doubtful the number of people who fish without license fishing, which in the region of the Canary Islands according to Jiménez-Alvarado (2010) may be around 10% more, so we would be talking about more than 100,000 licenses throughout the Canary Islands. If we analyze the data in relation to the total population of Canary Islands we see that there is a density of 45.4 licenses by 1,000 inhabitants, far superior to that of 8.2 licensing by 1.000 inhabitants recorded in

2005 (MAPyA, 2006). This data of 45.4 licenses per 1,000 inhabitants, one can compare with other areas of Mediterranean Sea, according to the facts of TRAGSA (2005) saw that we were well above all the regions, and that's the closer it would be the Balearic Islands with 41.81 lic. by 1,000 inhab., taking on average in Mediterranean Sea a density of 5.7 licenses by 1,000 inhabitants.

Other Administration slackness is in the regulation of this sector, as only with a fishing license, which you get with an administrative formality, you can go to the sea to fish, with the only limitation of 5 kilos of capture. Recreational fishing also has large economic benefits on the island, not directly, because the catches are not allowed to sell but if by the great infrastructure that is happening around them, for example by the sales of equipment for fishing (fishing rods, hooks, reels, ...), boats (and not only the boat, but all that it implies as los strings, anchors, GPS, probes,... and nautical repair companies, berths in port facilities, etc.). On the island the MAPyA (2006) estimated that it generated 117 million € per year compared to 9 million € generated by professional fishing. In the United States, recreational fishing has increased a 20% in the last 10 years, with an economic potential valued at tens of thousands millions euros (32,300 million € in 2006). In 1996, approximately 35.2 million Americans (all older than 16 years) spent 29,200 million € in equipment and services related to recreational fisheries (US Fish & Wildlife Service, 1997; 2006). In Australia it was estimated that the annual expenditure made by the recreational fishermen was around 3,800 million € (Murphy, 1998; Kearney, 1999). On the other hand in Europe it is valued that this sector moves a market of around 5 billion euros, generating 60,000 direct jobs and 39,000 indirect jobs (Kappel, 2007), and it was estimated that in 1996 there were around 21.3 million recreational fishermen licensed (Cowx, 1998), compared to only 180,000 professional fishermen.

The sport fishing pressure is very difficult to assess, since there is no information systems of catches, control over the quantities landed, information on days they go fishing, species which affect, etc. Nor is there an effective Administration monitoring system (Moreno-Herrero, 2011). In other parts of the country with similar characteristics as the Balearic and Mediterranean coast have been carried out similar studies (Coll et al., 2004; Morales-Nin et al., 2005; TRAGSA, 2005; Maria-Soliva, 2006) to try to determine the impact and shows that this activity is developed at a fraction of the population very heterogeneous, with a not insignificant fishing power and that has an substantial impact on resources. In Mallorca was evaluated mining capacity of the recreational sector and stood at around 30% (Morales-Nin et al., 2005) of the total catch landed on the Island. In Gran Canaria, recreational fishing is practiced by approximately 5.4 % of the population (37,265 people), compared to 769 professionals in 2001.

According MAPyA (2006), catches by fishing day of this sector on the island of Gran Canaria is 10.55 kg, being higher than that calculated for Tenerife island ( 6.11 kg). If this is join that fishermen, on average they spend about 43 days of the year on fishing and there are almost 28,000 licenses of 3<sup>th</sup> category currently, as this makes it a total of 12,702.2 ton per year. Although these data of the 2011 are estimates, it has been made the same calculation for the year 2005, where if we have reliable data (MAPyA, 2006). In 2005 there were in Gran Canaria a total of 5,695 licenses, so that the catches of this sector is estimated that were 2,583.53 ton. To this must be added the catch by fishermen who are not licensed.

This performance is far above the estimated by Luque et al. (2009), they estimated for the east island ( $0.29 \text{ kg. hook}^{-1} \text{ hour}^{-1}$ , with an average of 2 hooks per fisherman and fishing days between 4 and 7 hours). With these data we have a performance of 2.32 kg

for a day of 4 hours, and 4.06 kg for a day of 7 hour. In the same study it estimated an average fishing days of 24.6 days per year. If this is join the number of licenses in 2005, 5,695, with what we get annual catch of 325 ton year<sup>-1</sup>, for a day of 4 hours, and 569 ton year<sup>-1</sup> for a day of 7 hours. Other studies in Gran Canaria reveal that recreational fishing is performed especially in summer and on weekends, and it is estimated 115 days a year favorable for this activity. The day of every fisherman has been evaluated in about 3 hours of fishing, with a frequency of  $2.5 \pm 0.97$  days per week (Jiménez-Alvarado, 2010), as a consequence, according to the author, by the strong increase in unemployed persons who practice this type of fishing and they are seeking a way to pass the excessive leisure, obtain plug-ins for their own diet and, in some cases, such as an economic alternative to the sale of the catch. This frequency is high compared with studies in other parts of the country, since for example in Balearic Islands is estimated at  $5.5 \pm 0.15$  days per month, considering the months that they were going to fish, usually in summer, and 1.8 days per month for all months (Morales-Nin et al. , 2005). However, MAPyA (2006) estimated at 45 fishing days per year for the entire archipelago, while that in Catalonia was estimated at 40.24 days per year (Maria-Soliva, 2006). Studies more local, such as Luque et al. (2009), show that in the east of Gran Canaria each fisherman makes the activity 24.6 days per year, with an average of 1.52 (SD=0.61 ) days per week.

In general, sport fishing is not negligible compared to the professional fishing, because globally it is estimated 11.5% of the global catch is obtained by sport (11,000 ton per year; 47,000 million fish) (Cowx, 1999). The impact of recreational fishing on the fishery resources in the South Atlantic coast has been estimated at 12 % (Owen, 2004; Trujillo-Santana, 2009).

Other studies reveal that in the Canary Islands the impact of this sector is much greater, since it is estimated that the sports in the Canary Islands captured about 7 thousand ton annually, compared to the 10 thousand ton captured by professionals (data of 2004) (MAPyA, 2006), which implies that this sector gets around the 40% of the total catch. Similarly, Jiménez-Alvarado (2010) estimated that this contribution was around the 54.5 % in Gran Canaria (43.8 % for the entire archipelago), although it was possibly this value is underestimated as he used as a reference for the calculations the number of licenses granted in 2005 (16200 for the whole Archipelago). However, this fishing pressure of the sports sector is quite heterogeneous along the island territory, being more intense in the southern part of the island as a result of a greater concentration of ports that serve as a basis for a large number of recreational boats. Thus, in the east of Gran Canaria is estimated that the sport fishing impact was only 11.2 % of the total catch in this area, in 2008 (Luque et al. 2009).

With all these data so different and contradictory on the recreational fishing impact is clear the need to implement a regulation of this sector, and to implement an information system in order to determine not only the quantity of catch but also target species and the areas where they are captured, to be able to take measures in this regard, because with the current data the margin of uncertainty is fairly high.

In terms of professional fishing, things are not much better, because there are not a series of data history reliable catch for the entire island. The launching of the Real Decreto 2064/2004 (BOE 61 de Octubre de 29 de 2004) which is used to regulate the first sale of fishery products has enabled us to establish, since 2006 in some brotherhoods and since 2007 in all, control points and catch data collection by species. The importance of this measure is that it gives start to the creation of a reliable data series capture for the entire archipelago (catches of tuna were collected earlier as

requirement to charge the state aid and/or European to the marketing within the POSEICAN program). In the only brotherhood that has been able to make a historical database is Mogán, which thanks to the collaboration of a retailer is able to reconstruct a more or less complete since 1989, being able to analyze the state of exploitation that fishery resources are acted on the artisanal fleet (Hernández-García et al. 1998; Solari et al. 2003; Couce-Montero, 2009). To all this we must add the difficulty to obtain the information, so many times the managers of the brotherhoods ignorant some aspects of the fleet and how they work (action area, fishing hours, arts types, powers installed, ...), makes it very difficult to estimate the status of exploited stocks and their ecosystems.

In order to make a good management of resources is not only important to know the historical series of catches, but also the effort to obtain that catch. The choice of a unity of effort is perhaps what this greater difficulty, especially in fisheries such as the Gran Canaria, where they are used multitude of gear, target species well defined and in some cases with a marked seasonality. The only point in common is that it can be approximated to the tramps that are the modality of fishing more important, and can be generalized to all islands (Bas et al., 1995; Hernández-García et al., 1998), with the particularity of the gill nets and tuna on the basis of Arguineguín and Mogán fundamentally. In addition to all these difficulties we found that in Canary Islands there are no census of gear for professional or recreational fleet, not even the hours spent in the fishing or the expense of fuel used, so the only thing we can do are approximations to be able to estimate the effort.

The effort, measured as days of fishing, has increased in recent years due to existing market demand and, paradoxically, as a result of a decrease in the abundance of fish (Luque et al., 2009). So much so that in the case of the Gran Canaria island, the

Decreto 182/2004 has extended the number of legally traps used per vessel of the 25 who were allowed in the 1986 law to 75 at the present times (in the preamble Act of 1986 recognized the overfishing situation in which were fishing resources, while also posed a progressive reduction of 25 traps allowed until its total disappearance). However, this number is still very far from the average number of real traps deployed by fishing vessels. As well, Hernández-García et al. (1998) estimated that the Mogán fleet handled an average of 275 traps per boat at the end of the 1990s, having cases of fishermen who were handling a number close to 500 traps. This ability to handle traps and the consequent increase in fishing power was greatly favored by the incorporation of winches (lathes) to bring the same. Recently, Couce-Montero (2009) estimated by means of surveys, the average number of traps by boat in the same area of fishing has decreased significantly (180 units on average), due a 65% reduction in the size of the operational fleet as compared to 1996. In a similar way, and for area east-southeast of the Island, an area with much lower operational fleet, Luque et al. , (2009) estimated that the number of traps per boat almost doubles the legally permitted today, when setting figures purely in 141.87 (SD=73.38 ) units per boat.

In the east of Gran Canaria, professional fishermen are fishing between four and six days a week, getting an average catch per day fishing and boat round the  $20.05 \text{ kg. day}^{-1}$  ( $SD = 13.72$  ). Each trap gets a performance that ranges between 0.04 and  $2.05 \text{ kg. trap}^{-1}\text{day}^{-1}$ , with a mean value of  $0.22 \text{ kg. trap}^{-1}\text{day}^{-1}$  ( $SD = 0.16 \text{ kg. trap}^{-1}\text{day}^{-1}$ ) (Luque et al., 2009). In the southern area, with a similar fishing frequency yields are virtually identical ( $0.218 \text{ kg. trap}^{-1}\text{day}^{-1}$ ), and swings the capture per fishing day between 44 and 59 kg, depending on season of year and fishing area (Couce-Montero, 2009).

The Canary Islands is an important tourist point by the characteristics it possesses, so there are a high number of tourists throughout the year. One of the activities demanded is high seas fisheries (vessels of list 6<sup>th</sup>), which it has become a profitable business, especially in the ports of the tourist areas where there is a large influx of tourism. These services, in general, high seas fisheries, in which they seek large pelagic species such as billfish (isthiophoridae), swordfish (*Xiphias gladius*) bluefin tuna (*Thunnus spp.*; *Katsuwonus pelamis*), dolphin fish (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), etc., but also other species such as sharks and rays. This type of fishing is usually done in remote coast areas, not too distant from the insular platform, although its impact on the neritic resources island should not be very significant since it affects mainly on species that pass close to the islands during their migration. In addition, some of these companies are practicing the technique of catch and release.

In the Canary Islands have not been strategic action plans and regulation, in the medium or long term, which are oriented toward sustainability, but, paradoxically, if you have initiated plans for renewal fleet, increase and/or modification of the fishing power, etc., without taking into account the situation of the resources under fisheries, and thus producing a greater pressure to fishery resources.

One of the most notable differences with respect to 1984, is the presence of the recreational fishermen, so if we get the same catches before now, and we also have the recreational pressure, makes that the pressure on the island resources is very high, extracting much more than 25 years ago, so the yields are much lower and fishing days larger. This fact has been overlooked by the Administration, because a good management would be to limit in number or time recreational fisheries in Gran Canaria, to try to reduce the pressure on the part of this sector, which in the end is recreational.

## **5. Conclusion**

In general, it can be stated that the professional fishing sector has not achieved an appropriate adaptation to the changes experienced in the last decades (loss of external fishing grounds, expansion of aquaculture, stocks overexploitation, lack of generational renewal, growth of the sector of sport fishing). The aspects related to the phase extractive of the activity (new construction, modernization, equipment for ports, ...) have continued with financial resources that have improved the conditions of safety and work but may not have been tempered as should deal with the increasingly abundant symptoms of over-exploitation of the fishery.

Over time, the sector has been modernized and has evolved into a major infrastructure, but this evolution has not been reflected in the catches. This is symptomatic of the lack of management and good planning as it has invested heavily in infrastructures that are well above the sustaining capacity of the resource. This oversizing of the sector is the only thing that leads to increased spending by the brotherhoods, which have to continue to cover the maintenance of facilities, equipment and machinery used often below 50% capacity.

The Administration has shown signs of a lack of involvement and laziness when needed correct deviations mentioned, and at the time that design, develop and implement a management plan in accordance with the reality of the sector taking into account the state of resources and the load capacity of island marine ecosystems. On the contrary, it has adopted a grants scheme without clear objectives that will enable the sustainability of fishing activity through manage the financial autonomy of the brotherhoods and fishermen's cooperatives, and that these will become responsible for the management of public resources at its disposal, including fish stocks. It has not

established adequate systems to quantify the catch (no data from recreational fishing can account for almost 50% of total landings) and the efforts of the fleet, needed to make a reliable assessment of stock status.

Outside of the fisheries sector, tourism has been one of the largest beneficiaries of the impact of the structural funds for fishing, both by the direct infrastructures use designed initially to the fishing sector (port facilities and local social), and for the improvement of the environment and creation of new attractions. The recreational sector has exploited these port facilities, developing in many cases more use than professional fishermen, the latter being pushed, at the expense of how developments in the recreational sector. However, the latter helps alleviate the over-sizing of the fishing infrastructure, providing economic resources that serve to help the brotherhoods.

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## **1. Introducción**

La excesiva capacidad de pesca, en gran parte motivada por la sobrecapitalización, se está convirtiendo en una dificultad con fuertes implicaciones negativas a nivel internacional, regional, nacional e incluso a escala muy local (Castro, 2009). Las consecuencias ecológicas, económicas y sociales de esta sobrecapacidad de pesca han sido objeto de preocupaciones científicas, académicas y políticas (Pauly, 2008).

La gran mayoría de los países pesqueros importantes del mundo presentan un exceso de capacidad pesquera (Pauly, 2008), cuya consecuencia más inmediata no es solo una sobrecapacidad en términos de capital, mano de obra e insumos asignados a una pesquería en particular, sino también una creciente amenaza a la sustentabilidad de los recursos (Castro, 2009). En otras palabras, pésimos resultados económicos y sobrepesca biológica. La sobrecapitalización en la pesca da lugar al despilfarro de capital de inversión desaprovechado y, por consiguiente, a un costo excesivo de la captura (FAO, 1998; 2010). Tanto es así, y a pesar de que la pesca mundial mueve un mercado entorno a los 78.400 millones de dólares anuales (datos de 2005), las pérdidas económicas en las pesquerías marinas, resultado de una pésima gestión, ineficiencia y sobreexplotación, alcanzan los 50 mil millones de dólares al año, según el Banco Mundial y FAO (8 de octubre de 2008). En relación a las tres últimas décadas, las pérdidas totales rondan los 2 trillones de dólares. Las estimaciones excluyen las pérdidas asociadas al sector de la pesca recreativa, turismo, pesca ilegal, pérdida de biodiversidad e implicaciones en el ciclo del carbono en el océano (World Bank, 2008).

Ésta estrategia de explotación, con difícil sostenibilidad económica sería imposible sin la presencia de políticas de subsidios. A modo de ejemplo, EE.UU., entre 1996 y 2004, destinó a la industria pesquera subvenciones por valor de unos 6.400 millones de dólares (713 millones anuales en promedio). Sin embargo, el 56% de las ayudas totales

se destinaron a fines considerados “dañinos” para la sostenibilidad de los recursos, aumentando la sobrecapacidad de pesca, representando el 44% de las mismas, las ayudas al combustible. Los pescadores están exentos del pago de impuestos sobre el combustible, pero además tienen ayudas para construcción y mantenimiento de los buques. Igualmente, están exentos del pago de los servicios portuarios. El 44,4% del total de ayudas fue de utilidad ambigua (e.g. gran parte de la investigación realizada se destina a incrementar la explotación comercial de los stocks). En conclusión, la Administración Norteamericana subvenciona 1/5 del valor de la producción pesquera del país (Sharp y Sumaila, 2009). Desgraciadamente la política de pesca desarrollada en la Europa Comunitaria no es muy distante a la norteamericana, más bien es mucho más subsidiadora. Entre los años 2000 y 2006, la UE destinó 5,6 billones de euros (1253 millones de euros anuales en promedio a través del Instrumento Financiero para la Pesca) para subvencionar a la industria pesquera (Sporrong y Bevins, 2002). Curiosamente, parte de estas ayudas se destinaron incluso a la construcción de nuevos barcos, aun cuando se admite que la actual flota pesquera de la Unión presenta una sobrecapacidad de entre el 40 y 60%.

Es esta situación la que posiblemente esté llevando al colapso a la gran mayoría de los stocks (FAO, 2010). La sobreinversión conlleva a una sobre capitalización, y ésta al sobredimensionamiento y la consecuente sobreexplotación de los recursos (Fig. 1), alterando la aplicación del principio de conciliación y equilibrio entre la conservación y preservación de la biodiversidad y su aprovechamiento responsable. Según Myers y Worm (2003), la pesca industrial reduce la comunidad de peces en un 80% en solo 15 años de actividad. Es decir, en la actualidad, tras 60 años de explotación industrial, quedaría menos del 20% de la biomasa de peces existente a mediados del siglo XX. Por otro lado, la biomasa de los grandes predadores (atunes, peces espada, tiburones,

etc.) sería en estos momentos sólo el 10% de la que se estima había en el periodo preindustrial.

La conceptualización teórica así como las herramientas prácticas para determinar y manejar la capacidad de pesca (exceso o infrautilización de capacidad) están todavía en una fase de desarrollo, ya que siempre las medidas a tomar en materia de pesca han sido encaminadas a reducir el esfuerzo pesquero nominal (desguaces de barcos, vedas temporales, limitación de aparejos,...). El tratamiento de problemas de gestión en países en desarrollo donde la disponibilidad de datos e información, capacitación profesional e infraestructura para llevar a cabo y supervisar las políticas de gestión son inadecuadas y donde, sin embargo, los costos y pérdidas debido a este problema son probablemente los más grandes.

El problema de la ordenación de la capacidad pesquera fue abordado formalmente en 1997 por el Comité de Pesca de FAO (COFI), por la creciente preocupación del exceso de insumos y de capitalización en la pesca mundial. La labor realizada por FAO sobre esta base dio lugar a la preparación del Plan de Acción Internacional para la ordenación de la capacidad pesquera (FAO, 1998a y 1998b), que fue aprobada por el COFI en febrero de 1999 (FAO, 1999). Para este organismo el problema es fundamentalmente que hay demasiadas embarcaciones o una capacidad de explotación excesiva en un número cada vez mayor de pesquerías. La existencia de una capacidad pesquera excesiva es en gran medida responsable de la degradación de los recursos pesqueros, la desaparición del potencial de producción de alimentos y unas pérdidas económicas considerables (FAO 1999, FI: MM/99/2. Reunión de Ministros responsables de la Pesca). Ello se manifiesta sobre todo en forma de insumos pesqueros innecesarios y de sobrepesca de las poblaciones ícticas de mayor valor.

El exceso de capitalización pesquera afecta a las pesquerías nacionales de todo el mundo y se extiende cada vez más a las pesquerías de alta mar. Este exceso de capacidad ha sido un fenómeno progresivo debido entre otros, según Grèboval (2007), a los siguientes factores: (i) el efecto de la extensión de las zonas marítimas sometidas a la jurisdicción nacional en las estrategias privadas y públicas de inversión, y de las correspondientes políticas de explotación nacional de las nuevas zonas económicas exclusivas (ZEE), acompañadas generalmente de considerables programas de subvenciones; (ii) el fracaso de la ordenación pesquera, en general, y de los métodos de ordenación comúnmente utilizados, en particular, como las capturas totales permitidas (TACs) y otros mecanismos que tratan fundamentalmente de regular las capturas más que la capacidad de explotación en cuanto tal; (iii) la relativa movilidad de la capacidad de captura, que hizo posible un trasvase general del exceso de capital entre pesquerías, tanto dentro de las zonas sometidas a la jurisdicción nacional como aquellas de acceso libre en alta mar; (iv) la persistente rentabilidad de las actividades pesqueras, debido a que el progreso técnico y la relativa inflexibilidad de los precios han compensado ampliamente la disminución de los rendimientos en las pesquerías sobreexplotadas; (v) el carácter cambiante de este sector, que es cada vez más competitivo y requiere mayor utilización de capital, y cuyos mercados se basan ahora en buena medida en productos que son objeto de comercio internacional; y (vi) la débil administración pesquera que en muchos países ha permitido la actividad de embarcaciones de otros países o del mismo, sin disponer de la debida capacidad de vigilancia y fiscalización.

En consecuencia, el origen del exceso de capacidad pesquera se basa en dos elementos: en el desarrollo de una tendencia institucional generalizada de apoyo a las inversiones pesqueras, considerándolo sector de carácter estratégico, y el amparo de una pesca excesiva en condiciones de acceso libre. Posiblemente por ello, el Código de

Conducta para la Pesca Responsable (FAO, 2005) reconoce que el exceso de capacidad de pesca representa una amenaza para los recursos pesqueros mundiales y su capacidad de ofrecer capturas y beneficios sostenibles a los pescadores y consumidores. En el Artículo 6.3 del mismo se recomienda lo siguiente: « Los Estados deberían evitar la sobreexplotación, y el exceso de capacidad de pesca y deberían aplicar medidas de ordenación con el fin de asegurar que el esfuerzo de pesca sea proporcional a la capacidad de producción de los recursos pesqueros y al aprovechamiento sostenible de los mismos».

A medida que maduran las pesquerías, la reasignación del esfuerzo presenta mayores dificultades; la capacidad de pesca (en forma de esfuerzo que podría aplicarse a varias pesquerías alternativas) se va haciendo progresivamente demasiado grande para las oportunidades existentes y comienza a representar una amenaza para muchas pesquerías. Ello se produce muchas veces en forma de cascada (cuando una población está sobreexplotada y es objeto de ordenación eficaz, se produce una transferencia significativa de esfuerzo de pesca a la siguiente población más favorable, que se ve entonces sometida a una sobreexplotación progresiva, etc.). En otras palabras, comienza a observarse en el sector un exceso de capacidad. Si no se ha intervenido anteriormente, se presenta el problema de introducir medidas orientadas a controlar la capacidad en una situación de exceso de capacidad, cuando el sector muchas veces se encuentra en dificultades financieras consecuencia de una significativa reducción de sus capturas.

En aguas de Canarias la pesca ha sido tradicionalmente artesanal (no se consideran las flotas o fracciones de flota que han faenado o faenan en aguas de terceros países, y que establecen los puertos insulares como bases de operaciones logísticas, fundamentalmente para descarga y pertrechos; e.g. flota arrastrera de ANACEF, sardinales de Lanzarote, etc.), basándose por lo general embarcaciones pequeñas y artes

artesanales (Bas et al., 1995). No obstante, es importante tener en cuenta el papel que han jugado los acuerdos de pesca con Marruecos y Mauritania en la propia estructuración de la industria pesquera del Archipiélago, ya que supusieron que las islas fuesen un punto de referencia para muchas embarcaciones, no sólo españolas, que faenaban en los caladeros de África Occidental, particularmente en la zona conocida como Banco Canario-Sahariano. Esto permitió el desarrollo de infraestructuras e industrias que estaban vinculadas a estas flotas, al tiempo que también se dio soporte a una importante flota nacional arrastrera (fundamentalmente constituida por armadores gallegos y vascos, dedicados a la pesca de pulpo y crustáceos), atunera (también con una fuerte presencia de armadores vascos), además de la flota de cerqueros dedicada a la captura de sardinas y vinculada a la industria conservera de Lanzarote (Bas et al., 1995). Esta gran flota, asentada sobre todo en Gran Canaria, Lanzarote y Tenerife hizo que se impulsara mucho el sector pesquero de las islas, creándose gran cantidad de infraestructuras y empresas relacionadas directamente con este sector. En las islas de Gran Canaria y Lanzarote existían varias empresas de conservación de pescado (conservas, salazones, congelados,...) que no sólo daba trabajo a mucha gente sino que afianzaba cada vez más la importancia de este sector en la economía canaria (Bas et al., 1995). Tras las dificultades en las negociaciones de los acuerdos de pesca entre Marruecos y la Unión Europea, no se renueva este acuerdo en 1995 (Holgado y Ostos, 2002), lo que produjo un gran declive en el sector pesquero español, muy dependiente del Banco Canario-Sahariano. Esto provocó que gran número de empresas en Canarias relacionadas con el sector pesquero cerraran y muchos de los barcos que componía estas flotas desaparecieran por la imposibilidad de mantener el volumen de capturas que soportaba su existencia. Tras la desaparición de la gran mayoría de flota arrastrera, atunera y de los artesanales que trabajaban al fresco en la costa africana (desplazándolos

a otros caladeros alejados de las islas, vendiéndolos a terceros países o simplemente desguazándolos), sólo han permanecido las pequeñas embarcaciones dedicadas a la pesca artesanal de litoral, pero cuya operatividad no estaba relacionada con las infraestructuras creada para albergar a las grandes flotas antes citadas (e.g. Puerto de la Luz).

No obstante, a lo largo de las últimas tres décadas, también se han desarrollado infraestructuras específicas para la flota de pesca artesanal que faena en aguas neríticas de las islas (Bas et al., 1995), con objeto de mejorar la operatividad de la misma, así como alcanzar mejoras en la conservación y comercialización de los productos de la pesca. Así, en la isla de Gran Canaria existen seis puntos principales de descarga los productos de la pesca obtenida por estas pequeñas embarcaciones artesanales del litoral, que son Agaete, San Cristóbal, Melenara, Castillo del Romeral, Arguineguín y Mogán, constituidos entorno a cofradías o cooperativas de pescadores (GESPLAN, 2009; Moreno-Herrero, 2011). Es en estos lugares donde están instalados los puntos de control de la primera venta de la captura obtenida por los pescadores profesionales. En estas localidades siempre ha habido tradición pesquera, por lo que se establecieron en su momento pequeños núcleos y refugios para las embarcaciones, y con el paso de los años esas pequeñas infraestructuras han ido evolucionando, para adecuarse a las necesidades del sector y se han convertido en puntos principales de la actividad pesquera de la Isla.

La infraestructura necesaria para dar soporte al actual sector pesquero insular son relativamente grandes, ya que no sólo hacen falta cámaras frigoríficas y de fabricación de hielo para la conservación de la captura, basculas para su cuantificación, etc., sino que también se requiere la presencia de maquinaria para el mantenimiento y asistencia a las embarcaciones, tales como grúas, travelifts, agua, electricidad,... por lo que las inversiones, y el posterior mantenimiento, que se tienen que realizar son cuantiosas.

Una inadecuada dimensionalización de estas inversiones o la falta de programas eficientes de uso y mantenimiento de la infraestructuras, junto a políticas de gestión sin objetivo bien definidos, incluso erráticas en función de prioridades circunstanciales, pueden conducir a una sobrecapitalización del sector, inducida por una situación ficticia de viabilidad económica generada por las administraciones públicas, no sólo de aquellas con competencia directa en materia de pesca.

Por otro lado, el avance de muchas de las grandes infraestructuras asociadas al sector pesquero profesional ha ido al soporte del gran desarrollo experimentado por la pesca recreativa. En las últimas décadas el número de embarcaciones de recreo ha experimentado un aumento progresivo, arrastrando consigo a un importante sector industrial dedicado a este tipo de ocio, dando lugar a un flota de pesca (a la que hay que sumar el resto de modalidades de pesca recreativa), que comparte y compite no solo por los recursos pesqueros, sino también por las infraestructuras portuarias y sus servicios. En muchos casos el avance del sector recreativo ha sido mayor que el profesional, por lo que las obras han ido encaminadas a mejorar las comodidades de este sector (instalación de pantalanes, puntos limpios, grúas para la varada, obras para mejorar accesos,...), ayudando a sobredimensionar las necesidades del sector pesquero.

Por las características geomorfológicas de Gran Canaria existen multitud de puntos (puertos, muelles, embarcaderos y pequeñas playas) desde donde se produce la introducción y varada de pequeñas embarcaciones (Bas et al, 1995), algunas de carácter profesional (e.g. El Burrero, Arinaga, El Pajar, Playa del Águila, etc.), pero mayoritariamente dedicadas a la pesca deportiva, tanto con caña como submarina. Generalmente estos pequeños puntos no suelen llevar asociadas grandes infraestructuras, ya que muchas son pequeñas escolleras o abrigos con una rampa (caso de Sardina del Norte o el puerto de la Aldea de San Nicolás, por ejemplo), mientras que

en otros no existe nada y las embarcaciones son varadas directamente en la playa (e.g. El Puertillo, Arinaga, El Pajar, Playa del Águila, Las Canteras,...). Esta actividad “periférica” no supone inversiones en infraestructuras públicas que faciliten el acceso o la maniobrabilidad a de aumento de la seguridad de los pescadores, pero si repercuten en las inversiones que se han de destinar en el desarrollo de estrategias de gestión y control, particularmente de las capturas y el esfuerzo realizado.

El objetivo del presente estudio es evaluar la adecuación de la dimensión de las infraestructuras destinadas a la actividad pesquera en aguas de Gran Canaria, así como su estado de uso, a la capacidad de soporte de los stocks pesqueros, dentro de parámetros de sostenibilidad de estos últimos. Se intentará determinar si el posible sobredimensionamiento del poder de pesca, a través de las infraestructuras disponibles y su grado de uso, puede haber favorecido un aumento en el esfuerzo de pesca, al facilitar la operatividad de la flota y la sobrecapitalización del sector, estimulando así la sobreexplotación de los recursos.

## **2. Material y Método**

Para este estudio se ha realizado una búsqueda del material bibliográfico existente sobre los recursos pesqueros y la pesquería artesanal que se desarrolla en aguas de las Islas Canarias, a través de varios portales web especializados como SCOPUS o ASFA, así como documentos disponibles a través de la página web de la biblioteca de la Universidad de Las Palmas de Gran Canaria (ULPGC). Además, se realizaron encuestas específicas ( $N=12$ ) a pescadores profesionales de las 6 cofradías de Gran Canaria (ver Anexo I) con objeto de conocer su opinión sobre el estado del sector pesquero en la Isla. Por otro lado, también se efectuaron entrevistas con los cargos directivos (secretarios o

encargados) de dichas cofradías y cooperativas de pescadores para recabar información sobre el modo de funcionamiento de estas, así como de sus necesidades y deficiencias, tanto en la gestión como en las infraestructuras (ver Anexo II). Aparte de estos puntos principales de descarga, se han visitado todos los puertos, refugios y fondeaderos de la Isla para configurar un censo de infraestructuras y sobre el estado de usos y conservación de las mismas. Se han considerado no solo las instalaciones portuarias, sino todas aquellas que aunque se consideren accesorias (punto limpio, primera venta, accesibilidad, cámara de frío, carretillas, etc.) que puedan estar relacionadas o facilitar de algún modo con la actividad pesquera profesional o recreativa. Además, se han censado las embarcaciones presentes es cada uno de los lugares visitados, tanto de lista profesional (3<sup>a</sup>) como recreativa (6<sup>a</sup> y 7<sup>a</sup>). De esta forma se espera poder hacer una primera estimación del poder de pesca del conjunto de la flota.

Todo esta información ha permitido confeccionar un inventario de las infraestructuras disponibles en los principales puntos de descarga de las capturas, así como de aquellos lugares de la costa donde hay embarcaciones o puede haber entrada y salida de ellas.

Los datos de capturas desembarcadas por la flota artesanal entre 2006 y 2010 que se ha utilizado han sido proporcionados por la Viceconsejería de Pesca del Gobierno de Canarias, y proceden de los puntos de primera venta de las cofradías y cooperativas de pescadores ubicadas en Agaete, Melenara, Castillo del Romeral, Arguineguín y Mogán. En el caso de San Cristóbal (Las Palmas de Gran Canaria) se han utilizado datos del 2007, 2008, 2009 y 2010, ya que su punto de primera venta no estuvo operativo en 2006.

Se ha realizado una revisión bibliográfica de la información disponible, tanto escrita como en imágenes. Se han consultado varios informes técnicos elaborados por el Cabildo Insular de Gran Canaria (Plan Territorial Especial PTE-30 de Ordenación de Puertos Deportivos Turísticos e Infraestructuras Náuticas (Documento de Avance), así como informes sobre la pesca en la Isla o de las infraestructuras disponibles para la pesca desde la década de 1980, elaborados por investigadores del entonces Centro de Tecnología Pesquera de Taliarte (ahora Instituto Canario de Ciencias Marinas). Estos informes y documentos técnicos no son públicos y no están disponibles en la web, por lo que se trata de lo que se conoce como “literatura gris”.

Por otro lado se ha intentado analizar la configuración y estructura de las cofradías y cooperativas de pescadores y de las infraestructuras que estos tienen disponibles y que se encuentran bajo su responsabilidad, con el objeto de determinar la eficiencia de cada una de estas entidades. Para ello, se han valorado las infraestructuras disponibles en todas las instalaciones portuarias y cofradías/cooperativas, según su dimensionamiento al tamaño de la flota/capturas y estado de uso y conservación de las mismas, puntuando las mismas en función de criterios fijados previamente (Tabla 1). Para construir un índice de potencialidad se han señalado las infraestructuras presentes en cada punto y se les ha asignado el valor máximo, en una escala creciente de -5 a 5 en función de la eficiencia. El valor cero se otorga cuando la infraestructura no existe, mientras que los valores negativos se asignan cuando la infraestructura evaluada está presente pero no se utiliza para las funciones por las que se instalaron, restando eficiencia, o se destinan a funciones distintas no relacionadas con la pesca. Teniendo en cuenta esto, primero se han enumerado las infraestructuras disponibles y se les ha asignado el valor máximo, cinco, y se ha calculado la potencialidad total que podría tener la cofradía/cooperativa.

Las infraestructuras se han dividido en cuatro categorías (Tabla 2) en función de su uso y su repercusión en el sector pesquero.

Con este análisis se obtiene un valor máximo de potencialidad para cada categoría. Las categorías se han realizado en función de las siguientes características: (i) en la 1º categoría se encuadran las grandes infraestructuras; (ii) la 2º categoría engloba las maquinarias que se destina dar asistencia a las embarcaciones, traslado de la captura desde el barco a las almacenes y para la conservación; (iii) la 3º categoría son las facilidades disponibles para almacenaje, gestión y comercialización; y (iv) la 4º categoría asocia a todos aquellos equipamientos que pueden generar ingresos ajenos a la propia actividad extractiva realizada por los pescadores profesionales del lugar. En este último caso, la existencia de pescadería en la cofradía podría entenderse como una forma de comercializar los productos de la pesca de forma directa y, por tanto, podría encuadrarse en la categoría 3<sup>a</sup>, sin embargo en Gran Canaria cuando esta instalación está presente y en uso siempre es rentada por personas ajenas a los propios pescadores en régimen de alquiler, al igual que el restaurante.

Se creó una ficha con la información disponible de cada una de cofradía/cooperativa (Tablas 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 y 32) con punto de primera venta (al ser los puntos principales de las capturas descarga en la Isla), a través de la cual se evaluó su eficiencia siguiendo los criterios descrito en la Tabla 1. Una vez teniendo en valor del potencial y del nivel de uso, se ha calculó un índice de eficiencia a partir de la ecuación (1).

$$\text{Índice de eficiencia} = \frac{\text{Nivel de uso}}{\text{Máxima Potencialidad}} \quad (1)$$

De esta forma se estandarizó la eficiencia de las diferentes cofradías a pesar de su alta heterogeneidad en infraestructuras y sus grados de uso, valorando exclusivamente los medios disponibles.

A partir de la eficiencia para cada una de las cuatro categorías de infraestructuras para cofradía/cooperativa, se calculó la tasa de perdidas respecto a la máxima teórica. Para ello, se multiplicó la eficiencia en cada categoría por las capturas anuales totales desembarcadas por cada cofradía, y posteriormente se restó al valor de captura total inicial (ver ecuación 2). De esta forma los valores de pérdida de eficiencia quedaron acotados entre 0 y 1.

$$\text{Pérdida de eficiencia} = \text{Capturas iniciales} - \text{Capturas iniciales} \times \text{Índice de eficiencia} \quad (2)$$

También se realizó un inventario de las infraestructuras disponibles para la pesca en todos los puertos, abrigos, fondeaderos, playas,... (Anexo III) donde se desarrolla algún tipo de actividad pesquera profesional o deportiva. De esos lugares se censaron los equipamientos y número de embarcaciones según categoría.

A partir de los datos de licencias de pesca recreativa por modalidad expedidas en Canarias en el año 2005 (16.200), se realizó una extrapolación que permitiese estimar de forma aproximada el número de licencias por modalidad de pesca para el año 2011 en Gran Canaria, teniendo en cuenta que en dicho año el número total de licencias de pesca recreativa para todo el Archipiélago fueron 96.217 (Fuente: Consejería de Agricultura, Ganadería, Pesca y Medio Ambiente).

### **3. Resultados:**

En Gran Canaria existen seis puertos/refugios importantes que albergan a la casi totalidad de la flota artesanal profesional que faena diariamente en aguas entorno a Gran Canaria, que son Agaete, San Cristóbal, Taliarte, Castillo del Romeral, Arguineguín y Mogán. A estos puertos/refugios hay que añadir un importante número de playas, abrigos y escolleras que también sirven de base a un reducido número de embarcaciones, especialmente de pequeño porte, casco de madera y que de forma casi general suelen vararse en la trasplaya (e.g. Playa del Águila, Arinaga, El Burrero, Las Alcaravaneras, Las Canteras, Bañaderos, El Puertillo, Sardina del Norte, etc.).

En el interior de los recintos de los puertos principales se han instalado puntos de primera venta, desde donde el Gobierno de Canarias realiza un control de las capturas obtenidas diariamente, como paso previo e indispensable a la comercialización. Generalmente, estos puntos de primera venta son gestionados por las cofradías o cooperativas de pescadores afincados en dichos puertos. Estas cofradías, además, prestan diversos servicios a los pescadores asociados, como suministro de combustible, compras de materiales para los artes y las embarcaciones, gestión administrativa diversa (seguros, licencias, subvenciones, etc.), información de interés (partes meteorológicos, cambios en normativas, ayudas y subvenciones,...), curso de formación y capacitación, etc., siendo de gran ayuda para estos. Por ello, y para ello, las cofradías ha ido siendo dotadas por la Administración Autonómica de diversas infraestructuras que facilite su labor de apoyo al sector pesquero profesional de las islas, pero también estas mismas, por su propia estructura interna, dinámica de trabajo y modo de gestión, a menudo su mantenimiento económico puede suponer un hándicap para la Administración y los propios pescadores. Sin embargo, su necesidad para vertebrar a un sector pesquero con muchas carencias y deficiencias de diversos tipos (técnicas, de formación específica y

económicas, eficiencia comercial, etc.) es hoy por hoy indiscutible, aunque claramente mejorable (GESPLAN, 2009; Moreno-Herrero, 2011).

La pesca en Gran Canaria ha sufrido muchos cambios en las últimas décadas, ya que el adelanto en tecnologías en todos los ámbitos es evidente, y esta se ha ido incorporando al sector pesquero, tanto dentro de los barcos como en los puntos de descarga. En 1984, las infraestructuras eran casi inexistentes, las embarcaciones muy rudimentarias, y las condiciones de trabajo pésimas, ya que apenas se contaban con diques de abrigo y las descargas de los barcos se realizan a pie de playa (Gafo et al., 1984). En ese año, los puntos más importantes de descarga de captura obtenida por la flota artesanal que faenaba en aguas de la Isla eran La Aldea, Agaete, Las Palmas, San Cristóbal, Castillo del Romeral, Arguineguín y Mogán (Gafo et al., 1984), mientras que de Taliarte no hay datos disponibles. En las tablas 3, 4, 5 y 6 se puede cómo han evolucionado las mismas variables desde 1984 hasta 2011, en los principales puertos de descarga de hoy en día, a excepción de Taliarte que no hay datos.

La implementación tecnológica de los barcos con sistemas de posicionamiento por satélite (GPS), ecosondas, maquinillas, haladores, redes sintéticas, etc., ha ido de la mano de un aumento en el tamaño de los barcos y potencia de los motores, lo que hace suponer que su poder de pesca se haya incrementado sensiblemente con respecto al registrado en 1984. Ese poder de pesca, sin embargo no se ha traducido en un aumento de las capturas, ya que las cantidades desembarcadas han permanecido prácticamente similares (Fig.2 A), o incluso han disminuido como ha ocurrido en Mogán.

Por otro lado, el número de embarcaciones que componen la flota artesanal de la Isla no ha sufrido grandes variaciones entre 1984 y 2011 (139 y 138 barcos, respectivamente), aunque si hay diferencias cuando se analizan los puertos estudiados,

de modo que han disminuido en el Castillo del Romeral y Mogán, permanecen constantes en San Cristóbal y Agaete, mientras que únicamente en Arguineguín ha aumentado (Fig.2 B).

En general, el TRB (Tonelada de Registro Bruto o volumen de todos los espacios interiores del buque, incluso camarotes, alojamientos, etc.) total en cada punto ha aumentado desde 1984, excepto Castillo del Romeral (Fig. 2 C) donde ha disminuido, lo que indica que en general ahora tenemos más tamaño y capacidad de alojamiento. Pero si analizamos el TRB por barco vemos que en Castillo del Romeral y Arguineguín el TRB por barco se ha mantenido (Fig.3 C). En Arguineguín el TRB total ha aumentado como consecuencia de incremento de su flota (Fig. 2 B), aunque no así el TRB por barco (Fig. 3 C), mientras que en el caso de Castillo del Romeral, el número de barcos ha disminuido (Fig. 2 B) y el TRB por barco también, por lo que los barcos son prácticamente iguales que en 1984, aun siendo los barcos más pequeños de toda la flota de Gran Canaria y que, generalmente, se dedican a la nasa y a la liña. En el resto de puertos estudiados se ha experimentado un aumento del TRB, aun habiendo disminuido o mantenido el número de barcos. En conjunto, la capacidad de la flota, en TRBs, de toda la Isla ha aumentado respecto a 1984 (469 TRBs en 1984 y 694,9 en 2011) a pesar de haber disminuido el número de embarcaciones dedicadas a la pesca profesional, pero con unidades ahora de mayor tamaño.

El aumento de tecnologías, tanto en el barco como en tierra, facilita mucho la labor de los marineros a la hora de realizar sus labores, por lo que el número de marineros que faenan por cada barco también se ha visto disminuido. El número de marineros por barco se ha mantenido practicamente constante en Agaete y San Cristóbal mientras que en el resto ha disminuido con respecto a 1984 (Fig. 2 D).

A pesar de los avances técnicos introducidos y del aumento de la capacidad de las embarcaciones de pesca la captura no ha aumentado. Así, en Agaete, San Cristóbal, Castillo y Arguineguín los desembarcos se han mantenido en los mismos niveles que en 1984, mientras que en Mogán han disminuido respecto al mismo año (Fig. 2 A). Paradójicamente, los niveles de captura por embarcación han disminuido en San Cristóbal, Arguineguín y Mogán, mientras que en Agaete y Castillo del Romeral han permanecido prácticamente constantes (Fig. 3 A).

Pero aun teniendo los barcos más grandes, las capturas por unidad de TRB no han aumentado (Fig. 3 B), por lo que el tamaño de la flota actual es inadecuado para el nivel de capturas que tenemos en la isla de Gran Canaria, estando por tanto al flota sobredimensionadas. El caso que más estaría en concordancia con el nivel de pesca sería Castillo del Romeral, que ha disminuido el número de barcos, manteniendo el TRB y manteniendo también su nivel de capturas respecto a 1984, mientras que la mas sobredimensionada sería la flota de Mogán, ya que aun disminuyendo el número de efectivos de la flota (Fig. 2 B), esta ha aumentado su capacidad de pesca (Fig. 2 C), pero obtiene un nivel de capturas inferior (Fig. 3 A, B, D).

En 1984, toda la actividad pesquera se soportaba sobre unas infraestructuras muy limitadas, y en muchos casos muy precarias (Gafo et al., 1984), donde casi toda la actividad se realizaba a mano, desde la descarga de pescado o la varada de embarcaciones por ejemplo. Estas infraestructuras las podemos ver reflejadas en la Tabla 7.

El avance en cuestión de infraestructura ha sido muy grande, ya que actualmente los puntos de descarga están dotadas de muchas de las infraestructuras que antes carecían (Tabla 8). Actualmente, muchas de las infraestructuras, las gestionan las

cofradías presentes en cada punto, siendo diferentes los ingresos y gastos de cada una (Tabla 9).

Todas las cofradías presentan gastos similares (agua, luz, seguros y mantenimiento de la maquinaria), además, excepto en San Cristóbal, también los derivados del personal, principalmente administrativo. Igualmente, las fuentes de ingresos son también similares (alquiler de restaurante, cobro del canon de captura -menos en Mogán-, prestación de servicios de varada a embarcaciones deportivas, además de las necesitadas subvenciones -menos en San Cristóbal). Sin embargo, y aunque existe también cierta disparidad en cuanto a la eficiencia de cada una de estas asociaciones a la hora de establecer un uso razonable de las infraestructuras y equipamientos a los que cada una tiene acceso (Tablas 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 y 32), la mayoría de ellas se muestran actualmente sobredimensionados, muy por encima de sus posibilidades reales de pesca (Tablas 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 y 33).

A partir de todos los datos anteriores se ha construido una tabla resumen donde se muestran todos los índices de eficiencia para cada cofradía y para cada categoría (Tabla 34). Una vez obtenidos estos índices y las capturas de cada cofradía se ha construido la gráfica con la pérdida de eficiencia (Fig. 4), para poder comparar las distintas cofradías, en función del uso de sus infraestructuras y de sus capturas.

Analizando las grandes infraestructuras (categoría 1), las entidades menos eficientes son las cofradías de Agaete, San Cristóbal, Melenara y Castillo del Romeral, mientras que las más eficientes son Arguineguín y Mogán. En el caso de las dos últimas, el fundamento de su más alta eficiencia radica en las buenas condiciones de los puertos y equipamiento de las cofradías. En el caso de los casos de San Cristóbal y Castillo del Romeral es por las malas condiciones del dique de abrigo y las pocas

facilidades que ofrece a los pescadores. No obstante, el elemento menos eficiente en todos los puertos considerados está relacionado con el uso de toda la maquinaria directamente relacionada con la pesca (categoría 2). En general, su uso es poco eficiente en todos los puertos. En Castillo del Romeral, las pocas infraestructuras que tiene están por debajo de su capacidad, ya que aunque tiene pocas maquinarias, su uso es ineficiente por un mal diseño de las instalaciones. El caso de Arguineguín y Mogán, éstas están dimensionadas acorde a la pesquería estacional de túvidos, con capturas son muy variables, mientras que el resto del año los niveles de uso de sus capacidades de manipulación y almacenamiento de la pesca son significativamente mucho más bajos debido a las reducidas capturas de la pesquería de bento-demersales. En este sentido, la corporación más eficiente, en relación a las infraestructuras disponibles, es San Cristóbal al estar dimensionada a valores de capturas más o menos constantes, no dependientes de la pesca del atún, con un aprovechamiento máximo de sus instalaciones. En Agaete, la ineficiencia viene dada por el poco uso de las infraestructuras disponibles, muy sobredimensionada, con parte de su maquinaria por debajo del 50% de su capacidad. En Melenara, a pesar de que parte de las maquinarias están al 100% de su capacidad, otras están por debajo de su potencialidad de uso e incluso está siendo utilizada para otras actividades ajenas a la pesca motivo de su adquisición, como es el caso de las cámaras de frío, principalmente destinada a conservar hielo.

En la 3º categoría, que engloba las facilidades que tienen los pescadores en el puerto, la cofradía de Arguineguín es la más ineficiente en parte por las infraestructuras que no están siendo utilizadas para el cometido que fueron creadas. Por otro lado, en relación a la categoría 4º (posibilidades económicas de la cofradía y la convivencia con otros sectores económicos), Mogán es la única cofradía totalmente eficiente, ya que se

han desarrollado junto al sector recreativo y al turismo. Sin embargo, es este aspecto Agaete, San Cristóbal y Castillo del Romeral son las menos efectivas, posiblemente por la escasa potenciación de la industria socio-cultural y turística en dichas localidades, o por la poca colaboración con el sector recreativo y de la acuicultura. Este último aspecto está muy potenciado en Melenara.

Pero no solo existen infraestructuras dedicadas a la pesca en los puertos descritos, ya que en Gran Canaria existen muchos otros puntos (Fig. 5, tabla 36) con pequeños puertos, diques de abrigo, fondeaderos, rampas o playas (Fig. 35), donde tiene lugar una alta actividad de embarcaciones recreativas que ejercen actividad pesquera, mayoritariamente de carácter estacional, y donde la disponibilidad de infraestructuras y accesibilidad es muy heterogénea (Tabla 37).

Se estima que en Gran Canaria existen aproximadamente unas 3.385 embarcaciones recreativas (Tabla 37) distribuidos en diversos puertos, muelles deportivos, fondeaderos, etc., lejos de las 7.162 embarcaciones en lista 7º y 241 en lista 6º censadas en 2005 (MAPyA, 2006; Anónimo, 2011). Esta parte de la flota deportiva que no se encuentra asociada a infraestructuras de amarre está constituida principalmente por pequeñas embarcaciones, mayoritariamente construidas en fibra de vidrio y de unos 3 m de eslora, que son extraídas del agua con ayuda de remolques y guardadas en garajes después de cada salida.

De este total de embarcaciones, el 43,4% son las que se dedican a la pesca de recreo (MAPyA, 2006). Teniendo en cuenta que la isla de Gran Canaria tiene un perímetro de 242 km de costa, nos encontramos con una densidad de 14 embarcaciones por kilómetro de costa (esta densidad se incrementa a 29,59 embarcaciones/km si se toma como referencia el total de barcos recreativos censados, 7.162).

Este alto número de embarcaciones, viene reflejado también en un alto número de licencias de pesca, ya que en 2005 habían un total de 5.699 licencias expedidas en Gran Canaria y 16.237 licencias en toda Canarias. Esto supone que Gran Canaria soporta el 35,1% del total de las licencias de Canarias (Tabla 38), por lo que teniendo esto en cuenta se ha calculado esta misma aportación para abril de 2011, donde existían en Canarias un total de 96.217 licencias, por lo que en Gran Canaria se estima que existen actualmente en torno a las 33.772 licencias de pesca (Tabla 39).

En Canarias, por las buenas condiciones climatológicas que existen, ofrece unas buenas posibilidades para la pesca, es por ello que más de la mitad de los pescadores recreativos practican esta actividad durante todo el año, viéndose aumentado en verano y primavera (Fig. 6).

#### **4. Discusión**

La evolución de las infraestructuras se ha desarrollado mucho en las últimas décadas, intentando adecuarse a la situación actual e ir implementando cada vez más las nuevas tecnologías. Pero esta evolución no ha ido acorde con el nivel de explotación del recurso (en 1986 la Ley de Pesca de Canarias consideraba que la mayoría de los recursos se encontraban en sobrepesca), dejándolo de lado y tendiendo cada vez más a aumentar el poder de pesca. En los últimos 25 años se han desarrollado grandes infraestructuras dedicadas en apoyo de este sector, se ha aumentado la capacidad de los barcos al tiempo que parte de la flota ha sido renovada, tanto en motores, incorporación de maquinaria auxiliar (e.g. maquinillas, haladores, etc.) y tecnología (e.g. sondas, GPS,...), además de incorporar más equipamientos en los puertos (cámaras de frío, fabricas de hielo, elevadores, etc.). También se han mejorado las condiciones para el

mantenimiento de los barcos, instalando travelift o grúas. Sin embargo, y como era de esperar por la situación de partida, este aumento del poder de pesca (en barcos e infraestructuras) en los últimos 25 años no ha llevado emparejado un aumento de capturas, sino que únicamente ha conseguido en el mejor de los casos mantener los mismos niveles (en Mogán han descendido) a un mayor coste.

No obstante, el potencial extractivo de la flota no sólo se debe medir en número de barcos, potencia, TRB, marineros,... ya que las infraestructuras que asisten a la pesca de una forma u otra también juega un papel fundamental en el poder de pesca y en la capacidad para convertir dicho poder de pesca en esfuerzo efectivo. La maniobrabilidad, los procesos de carga y descarga, los sistemas de conservación y control sanitario, la accesibilidad por carretera y las facilidades de comercialización de los productos de la pesca, y la asistencia técnica para reparaciones de los equipos, alojamiento de pertrechos y refugio para las embarcaciones, son aspecto cruciales que aumentan el poder de pesca de forma muy significativa. Son posiblemente estas infraestructuras en tierra las que marcan la diferencia entre el poder de pesca de los países desarrollados y en desarrollo, con independencia de la riqueza de los caladeros sobre los que inciden. Cada vez son más y más estrictos los controles sanitarios, los métodos de conservación, transporte y manipulación de los productos pesqueros, por lo que se hace más necesaria infraestructuras más tecnificadas y costosas, en muchos casos son sobredimensionadas al adecuado nivel de capturas que pueden soportar los stocks objetivos de la actividad extractiva. Por comparación, las infraestructuras existentes en 1984 (Tabla 7) estaban muy por debajo, en número, tamaño y tecnificación, de las actuales. El Puerto de La Luz y de Las Palmas era la instalación que más infraestructuras tenía, ya que aquí se desembarcaban también capturas procedentes de terceros países, principalmente de la flota industrial que faenaban en el banco Canario-Sahariano (Bas et al., 1995; Gafo et

al., 1984). Las otras cinco localidades de la Isla donde se centraba la actividad pesquera realizada en aguas neríticas estaban poco desarrolladas en la década de 1980 (Tabla 7), pero aún así ya se vivía una situación de sobrepesca, tal y como se refleja en el preámbulo de la ley de pesca de Canarias promulgada en 1986 (Barrera-Luján, 2011).

A principios de la década de 1980 la mayoría de los puertos de descarga apenas contaban con un dique de abrigo (Agaete, Arguineguín y Mogán), o simplemente las labores se realizaban desde una playa (San Cristóbal y Castillo del Romeral), teniendo que varar las embarcaciones al final de cada jornada. La única tecnología que poseía el barco era el motor y todas las labores se realizaban a mano, tanto en la pesca como en la descarga del pescado. Pero curiosamente la inversión en infraestructuras, equipamientos y tecnología (Tabla 8) no ha significado un incremento de las capturas ni del número de barcos que componen la flota, aunque si en la capacidad de pesca (medida en TRB) y en el poder de pesca de la misma. Todo este desbarajuste no es más que una clara muestra de la incapacidad de evaluación de la situación por parte de las administraciones competentes, ya que no han sabido adecuar la dimensión de este sector (profesional y recreativo) al excedente de biomasa que podían generar los stocks de especies de interés pesquero. Se ha querido impulsar a toda costa, y desgraciadamente aún se sigue haciendo, un sector primario (la pesca artesanal) y otro terciario (la pesca recreativa) sin analizar previamente la capacidad de soporte de los ecosistemas marinos y sus poblaciones a la presión extractiva ejercida, sin establecer una planificación a corto, medio o largo plazo, de los niveles extractivos adecuados y establecer las medidas para atemperar el impacto de esta actividad.

Desde 1984, la inversión en infraestructuras ha sido muy elevada, no solo por la construcción de nuevos puertos, como San Cristóbal, donde no existía dique de abrigo, sino también por la remodelación casi completa que han sufrido otros puertos como el

de Agaete o Mogán. En otros puntos la inversión en construcción de puertos ha sido más pequeña, como es el caso de Castillo del Romeral. El muelle de Arguineguín permanece prácticamente igual al de antaño, salvo obras de refuerzo exterior o elevación del espaldar del dique. En cuanto a las maquinarias (grúas, travelift, etc.) y servicios (oficinas, almacenes, etc.), se ha avanzado mucho y prácticamente todas las cofradías están dotadas. Así, en conjunto se puede afirmar que el nivel de infraestructuras de apoyo a la pesca en Gran Canarias es elevado al poseer seis puntos de control y registro de capturas (primera venta) con una importante dotación de equipamientos, aunque funcionando muy por debajo de sus posibilidades o incluso paradas. Es curioso el gran avance en cuanto a infraestructuras y la poca evolución de las capturas, ya que no han aumentado en proporción a las infraestructuras y poder de pesca incorporado a la flota.

Gran parte de la estrategia pesquera de la Isla se ha basado en la pesquería estacional de túnidos, con grandes volúmenes de captura y significativos ingresos para el sector pesquero a través de la exportación, siendo la pesca de especies bento-demersales casi una cuestión de subsistencia (Bas et al., 1995). Posiblemente, estos niveles de extracción, a modo de espejismo, han condicionado mucho el diseño y dimensionado actual del sector pesquero artesanal. Sin embargo, la caída repetida y repentina de los niveles de captura por diversos motivos (estado de los stocks, cuestiones ambientales o simplemente caída de la demanda) han dado lugar que todo el poder de pesca que se creó entorno a estas posibilidades de pesca se hayan ido desviando progresivamente hacia las especies bento-demersales y pelágico-costeras acentuando la situación de sobreexplotación (REPESCAN, 2008) y el declive de este sector primario. Esta relación que existe entre la pesca de túnidos y la pesca de bento-demersales, hace que se tienda a explotar más a los bento-demersales cuando no

aparecen los túnidos (Fig. 7 y 8). A este sobredimensionamiento del sector pesquero artesanal hay que sumar el desmedido crecimiento del sector pesquero recreativo que, con más de 96.000 licencia en 2011, puede estar acentuando el impacto sobre los ya muy mermados recursos bento-demersales. Tanto es así, que en 2005, con 16.200 licencias, el MAPyA (2006) estimó que la capacidad extractiva de este sector rondaba el 40% de las capturas totales, y Jiménez-Alvarado (2010), a partir del mismo número de licencias, estimó que en Gran Canaria ese poder extractivo significaba el 56 % de las capturas totales.

No solo influye la cantidad de infraestructuras presentes en un puerto, sino también es determinante su uso, ya que a la hora de realizar inversiones para la colocación o modernización, va a depender su rentabilidad, y en muchos casos no se utiliza la lógica para implantar una nueva maquinaria o servicio.

La sobredimensionalización de las cofradías viene dada por una política de subvenciones, en muchos casos incoherentes con la situación de sobreexplotación en la que se encuentran los stocks (REPESCAN, 2008), donde se ha premiado más el contentar a los que conforman el sector que el establecer medidas de gestión y control encaminadas a la sostenibilidad del recurso pesquero. La actual estructuración y dimensionado del sector pesquero, tanto artesanal como deportivo, es insostenible. Quizás el punto más visible es la sostenibilidad económica de las cofradías, teniendo en muchos casos que depender de subvenciones incluso para pagar el agua y la luz, y posiblemente situación de déficit “crónico” la que propicia que gran parte de los equipos y dotaciones se encuentran paradas o a medio funcionamiento. A partir del 2007, con la llegada de la actual crisis económica, esta situación se ha agravado aún más, y la totalidad de las cofradía ha establecido como estrategia de supervivencia el externalizar servicios (Tabla 9) y de ahorro principalmente reduciendo gastos derivados

de agua y luz. Desgraciadamente, esta estrategia de ahorro también ha derivado en una importante reducción del mantenimiento de los equipos, haciéndose cada vez menos eficientes. En Gran Canaria, la dependencia de las subvenciones por parte de las cofradías es una realidad, a excepción de San Cristóbal, donde abogan por no pedir subvenciones, subsistiendo gracias a no tener personal contratado, controlando los gastos de agua y luz, y por la autogestión de la maquinaria, tanto por cuestiones de mantenimiento como de manejo.

Todas las cofradías presentan gastos similares (agua, luz, seguros y mantenimiento de la maquinaria), además, excepto en San Cristóbal, también los derivados del personal, principalmente administrativo. Igualmente, las fuentes de ingresos son también similares (alquiler de restaurante, cobro del canon de captura -menos en Mogán-, prestación de servicios de varada a embarcaciones deportivas, además de las necesitadas subvenciones -menos en San Cristóbal). Sin embargo, y aunque existe también cierta disparidad en cuanto a la eficiencia de cada una de estas asociaciones a la hora de establecer un uso razonable de las infraestructuras y equipamientos a los que cada una tiene acceso (Tablas 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 y 32), la mayoría de ellas se muestran actualmente sobredimensionados, muy por encima de sus posibilidades reales de pesca (Tablas 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 y 33).

Un papel importante de las cofradías de pescadores es la de suministrar información sobre las capturas realizadas y el esfuerzo invertido en ello, de modo que la Administración pueda realizar las correspondientes evaluaciones del estado de los stocks. Desgraciadamente, en Gran Canaria ninguna de las cofradías ha ido generando de forma rutinaria una serie de datos que permita realizar dicha labor, posiblemente como consecuencia de que la propia Administración tampoco ha hecho el suficiente esfuerzo como para que este proceso lógico y necesario tuviese lugar. Sólo a partir del

año 2006 en las cofradías, a través de los puntos de primera venta, se comenzó a recoger información sobre las capturas desembarcadas, aunque se producen, a veces, fallos en la identificación de las especies a las que se asignan dichos valores (Martínez-Saavedra, 2011). Desgraciadamente, estos fallos se deben a una falta de formación previa por parte de la Administración competente en esta materia y a una falta de profesionalización en la toma de datos vitales para la evaluación y gestión de los stocks explotados. En cuanto a la información recopilada en las notas de ventas, es insuficiente, ya que lo único que se anota es la especie, con su nombre científico y nombre común, el peso, datos del comprador y vendedor, y la zona de pesca, que ya viene predeterminada por los programas informáticos implantados por la Viceconsejería de Pesca la zona FAO 34.1.2 (Fig.9), que engloba la zona de Canarias. Estas cuestiones no son achacables a los miembros de las cofradías, ya que ellos simplemente llenan las fichas que les son implantadas. Este hecho es otra prueba de la inefficiencia por parte de la Administración, ya que no permite anotar datos relevantes para una posterior gestión de los recursos, como sería datos más precisos de capturas, artes empleados, tiempo de faena, gasto de combustible,... Echo que hace pensar una vez más la falta de intensión y la imposibilidad de realizar cualquier gestión sobre los recursos de la Isla.

La actividad pesquera litoral siempre ha mantenido una relación con el turismo, ya que este se ha convertido en un competidor por los espacios, trabajo y capital. Sin embargo, también ha ampliado el mercado de los productos de la pesca, y ha fomentado que en algunas localidades las mismas familias de pescadores combinen ingresos de ambos sectores mediante la gestión de restaurantes, apartamentos,... La combinación de actividades podría tener como resultado una disminución del esfuerzo sobre especies demersales, colaborando además con la financiación de los barcos mayores en los momentos de escasez de túnidos si fuera posible utilizar estas embarcaciones para cierto

tipo de excursiones marítimas. Actividades como la pesca-turismo, exposiciones sobre la pesca en Canarias o las visitas para ver como se descarga el pescado, podrían ser fuentes alternativas de ingresos, que podrían ayudar a reducir el esfuerzo e intentar diversificar el sector, y no ser tan dependiente ni de la pesca ni de subvenciones.

Pero en la Isla no solo incide sobre los recursos pesquero la flota profesional, ya que en la Isla, el sector recreativo ha cogido mucha fuerza y existen gran número de muelles y fondeaderos donde se localizan un gran número de embarcaciones recreativas, con un importante impacto sobre los recursos pesqueros (Jiménez-Alvarado, 2010). Desde hace muchos años se ha pensado que la sobreexplotación de los recursos pesqueros se debía única y exclusivamente a los pescadores profesionales, pero se ha visto que la pesca recreativa o deportiva también tiene un gran impacto en la reducción de los stocks de peces e invertebrados (Cooke y Cows, 2006). La pesca recreativa se ha visto que puede tener un impacto similar sobre los stocks y ecosistemas como la pesca profesional (Hall, 1999; Coll et al., 2004; Lewin et al., 2006) y en ciertas áreas pueden extraer una fracción superior de capturas que la de la flota profesional (Kearney, 1999; McPhee y Skilleter, 2002; MaPhee et al., 2002). A nivel mundial se estima que la captura obtenida por los pescadores deportivos supera los dos millones de toneladas (Cowx, 1999). Por ejemplo en Estados Unidos, la pesca recreativa supone un 25% de las capturas anuales de las especies más vulnerables (Cooke y Cowx, 2004), mientras que en México, en el año 2002, las capturas recreativas representaron el 64% del total obtenido de las especies más amenazadas (Owen, 2004). Concretamente, en Canarias, el MAPyA (2006) estimó que en 2005 la contribución de la pesca recreativa a la captura total era entorno al 40% del total de las capturas realizadas.

En este contexto, no se puede despreciar el impacto que el sector de la pesca recreativa puede estar teniendo sobre los recursos pesqueros de la Isla. Así, en 2005,

en Canarias existían un total de 16.237 licencias, 5.699 de las cuales pertenecían a personas residentes en Gran Canaria (Tabla 38). En 2011 el número total de licencias en el Archipiélago asciende a 96.217.

A estas 96.000 licencias hay que sumarles el número de personas que pescan sin tener la correspondiente licencia de pesca, que en la región de Canarias según Jiménez-Alvarado (2010) puede rondar el 10% más, por lo que estaríamos hablando de más de 100.000 licencias en toda Canarias. Si analizamos los datos en relación a la población total de Canarias vemos que hay una densidad de 45,4 licencias por 1.000 habitantes, muy superior a la de 8,2 licencias por 1.000 habitantes registrada en 2005 (MAPyA, 2006). Este dato de 45,4 licencias por 1.000, se puede comparar con otras zonas del Mediterráneo, ya que según los datos de TRAGSA (2005) se ve que estamos muy por encima de todas las regiones, y la que más se le acercaría sería las Islas Baleares con 41,81 lic. por 1.000 hab., teniendo de media en el Mediterráneo una densidad de licencias de 5,7 lic. por 1.000 hab.

Otra dejadez de la Administración la encontramos en la regulación de este sector, ya que tan solo con una licencia de pesca, la cual obtienes tan solo con un trámite administrativo, puedes ir a la mar a pescar, con la única limitación de 5 kilos de captura. La pesca recreativa también grandes beneficios económicos en la Isla, no directamente ya que las capturas no se pueden vender pero si por la gran infraestructura que hay a su alrededor, por ejemplo por las ventas de material para pesca (cañas, anzuelos, carretes,...), embarcaciones (y no solo la embarcación, sino todo lo que ello conlleva como cabos, anclas, GPS, sondas,... y empresas de reparación náutica, atraque en instalaciones portuarias, etc.). En la Isla el MAPyA (2006) estimó que generaba 117 millones de euros anuales frente a los 9 generados por la pesca profesional. En Estados Unidos, la pesca recreativa ha aumentado un 20% en los últimos 10 años, con un

potencial económico valorado en decenas de miles de millones de euros (32.300 millones de euros en 2006). En 1996, aproximadamente 35,2 millones de norteamericanos (todos mayores de 16 años) gastaron 29.200 millones de euros en equipos y servicios relacionados con la pesca recreativa (US Fish & Wildlife Service, 1997; 2006). En Australia se estimó que el gasto anual realizado por los pescadores recreativos rondó los 3.800 millones de euros (Murphy, 1998; Kearney, 1999). Por otro lado en Europa se valora que el sector mueve un mercado de unos 5 billones de euros, generando unos 60.000 puestos de trabajo directos y 39.000 indirectos (Kappel, 2007), estimándose que en 1996 existían alrededor de 21,3 millones de pescadores recreativos con licencia (Cowx, 1998), frente a solo 180.000 pescadores profesionales.

La presión pesquera por parte de los deportivos es muy difícil de evaluar, ya que no existen sistemas de información de las capturas, control sobre las cantidades desembarcadas, información sobre los días que salen a pescar especies sobre las que inciden, etc. Tampoco existe un sistema de vigilancia eficaz por parte de la Administración (Moreno-Herrero, 2011). En otras partes del país con características similares como Baleares y la costa Mediterránea se han realizado estudios parecidos (Coll et al., 2004; Morales-Nin et al., 2005; TRAGSA, 2005; María-Soliva, 2006) para intentar determinar el impacto y se muestra que esta actividad es desarrollada por una fracción de la población muy heterogénea, con un poder de pesca nada despreciable y que tiene un impacto sobre los recursos considerable. En Mallorca se evaluó la capacidad extractiva del sector recreativa y se situó en torno al 30% (Morales-Nin et al., 2005) de la captura total desembarcada en la Isla. La pesca recreativa en Gran Canaria lo practica aproximadamente el 5,4 % de la población (37.265 personas), frente a 769 profesionales en 2001.

Según MAPyA (2006), las capturas por marea de este sector en la isla de Gran Canaria es de 10,55 kg, siendo superior a la calculada para la isla de Tenerife de 6,11 kg. Si esto lo unimos a que los pescadores, de media dedican aproximadamente 43 días al año a la pesca y hay casi 28.000 licencias de 3º categoría actualmente, pues hace un total de 12.702,2 tn anuales. Aunque estos datos del 2011 son estimaciones, se ha realizado el mismo calculo para el año 2005, donde si tenemos datos fiables (MAPyA, 2006). En 2005 había en Gran Canaria un total de 5.695 licencias, por lo que las capturas de este sector se estiman que fueron de 2.583,53 tn. A esto habría que sumarle las capturas realizadas por los pescadores que no tienen licencia.

Este rendimiento están muy por encima del estimado por Luque et al. (2009), estimaron para el este de la Isla ( $0,29 \text{ kg. anzuelo}^{-1} \text{ hora}^{-1}$ , con una media de 2 anzuelos por pescador y unas jornadas de pesca de entre 4 y 7 horas). Con estos datos tenemos un rendimiento de 2,32 kg para una jornada de 4 horas y de 4,06 kg para la jornada de 7 horas. En ese mismo estudio se calculó una media de jornadas de pesca de 24,6 días al año. Si esto lo unimos al número de licencias en 2005, 5.695, con lo que obtenemos unas captura anuales de  $325 \text{ tn. año}^{-1}$ , para una jornada de 4 horas y de  $569 \text{ tn. año}^{-1}$  para una jornada de 7 horas. Otros estudios realizados en Gran Canaria revelan que la pesca recreativa se realiza sobre todo en verano y fines de semana, estimándose unos 115 días al año favorables para realizar esta actividad. La jornada de cada pescador se ha evaluado en unas 3 horas de pesca, con una frecuencia de  $2,5 \pm 0,97$  días a la semana (Jiménez-Alvarado, 2010), consecuencia, según el autor, del fuerte incremento de personas en paro que practican este tipo de pesca y que buscan en la misma una forma de pasar el excesivo tiempo muerto, obtener complementos para su propia dieta y, en algunos casos, como una alternativa económica con la venta de la captura. Esta frecuencia es alta comparada con estudios realizados en otras partes del país, ya que por

ejemplo en Baleares se estimó en  $5,5 \pm 0,15$  días al mes, considerando los meses que iban a pescar, generalmente en verano, y 1,8 días al mes considerando todos los meses (Morales-Nin et al., 2005). Sin embargo, el MAPyA (2006) estimó en 45 días pescador  $^{-1}\text{año}^{-1}$  para todo el archipiélago canario, mientras que en Cataluña se estimó en 40,24 días al año (María-Soliva, 2006). Estudios más locales, como el de Luque et al. (2009), muestran que en el este de Gran Canaria cada pescador realiza la actividad 24,6 días al año, con una media de 1,52(SD=0,61) días por semana.

En general, la pesca deportiva no es nada despreciable frente a la pesca profesional, ya que de forma global se ha estimado el 11,5 % de las capturas mundiales es obtenida por los deportivos (11.000 t anuales; 47.000 millones de peces) (Cowx, 1999). El impacto de la pesca recreativa sobre los recursos pesqueros en el sur de la costa atlántica se ha estimado en un 12 % (Owen, 2004; Trujillo-Santana, 2009).

Se han realizado estudios en Canarias donde el impacto de este sector es mucho mayor, ya que se estima que los deportivos en Canarias capturan aproximadamente 7 mil tn. anuales, frente a las 10 mil tn. capturadas por los profesionales (datos del 2004) (MAPyA, 2006), lo cual implica que este sector obtiene entorno al 40% de la captura total. Igualmente, Jiménez-Alvarado (2010) estimó que esta contribución rondaba al 54,5% para Gran Canaria (43,8% para todo el Archipiélago), aunque posiblemente este valor está subestimado ya que utilizó como referencia para los cálculos el número de licencias otorgadas en 2005 (16200 para todo el Archipiélago). Sin embargo, esta presión pesquera del sector deportivo parece ser bastante heterogénea a lo largo del territorio insular, siendo más intensa en la vertiente sur de la Isla como consecuencia de una mayor concentración de puertos que sirven de base a un gran número de embarcaciones de recreo. Así, en el este de Gran Canaria se estima que el impacto de la

pesca deportiva fue sólo del 11,2 % de la pesca total en esa zona, en 2008 (Luque et al. 2009).

Con todos estos datos tan diferentes y contradictorios sobre el impacto de la pesca recreativa hace evidente la necesidad de implantar una regulación de este sector, e implantar un sistema de información para poder determinar no solo la cantidad de capturas sino también las especies objetivo y las zonas donde se capturan, para poder tomar medidas al respecto, ya que con los datos actuales el margen de incertidumbre es bastante alto.

En cuanto a la pesca profesional, las cosas no están mucho mejor, ya que no hay una serie de datos historia fiable de capturas para toda la Isla. La puesta en marcha del Real Decreto 2064/2004 (BOE 61 de 29 de octubre de 2004) por el que se regula la primera venta de los productos pesqueros ha permitido establecer, desde 2006 en algunas cofradías y desde 2007 en todas, puntos de control y recopilación de datos de captura por especie. La importancia de esta medida es que da inicio a la creación de series de captura fiables para todo el Archipiélago (las capturas de túnidos se recopilaban con anterioridad como exigencia para cobrar las ayudas estatales y/o europeas a la comercialización dentro del programa POSEICAN). En la única cofradía que se ha podido realizar una base de datos histórica es la de Mogán, en la que gracias a la colaboración de un comerciante minorista se ha podido reconstruir una aproximación más o menos completa desde 1989, pudiéndose analizar el estado de explotación en el que se encuentran los recursos pesqueros sobre los que actúa la flota artesanal (Hernández-García et al., 1998; Solari et al., 2003; Couce-Montero, 2009). Todo esto unido a la dificultad para obtener la información, ya que muchas veces los administradores de las Cofradías desconocen algunos aspectos relativos a la flota y a su forma de trabajar (área de acción, horas de pesca, tipos de artes, potencias

instaladas,...), hace que sea muy difícil estimar el estado de los stocks explotados y sus ecosistemas.

Para poder hacer una buena gestión de los recursos no es solo importante conocer la serie histórica de capturas, sino también el esfuerzo para obtener dicha captura. La elección de una unidad de esfuerzo es quizás lo que presente mayor dificultad, especialmente en pesquerías como las de Gran Canaria, donde se utilizan multitud de artes y aparejos, especies objetivo bien definidas, y en algunos casos con una marcada estacionalidad. El único punto en común es que se puede aproximar a que la nasa es la modalidad de pesca más importante, y se puede generalizar a toda la Isla (Bas et al., 1995; Hernández-García et al., 1998), con la particularidad de las trañas y atuneros con base en Arguineguín y Mogán fundamentalmente. Además de todas estas dificultades nos encontramos que en Canarias no hay ningún censo de artes/aparejos al uso por parte de la flota profesional ni recreativa, ni tan siquiera las horas invertidas en la pesca o del gasto de combustible empleado, por lo que lo único que se puede hacer son aproximaciones para poder estimar el esfuerzo.

El esfuerzo, medido como jornadas de pesca, ha aumentado en los últimos años debido a la demanda comercial existente y, paradójicamente, como consecuencia de una disminución de la abundancia de peces (Luque et al., 2009). Tanto es así que en el caso concreto de la isla de Gran Canaria, el Decreto 182/2004 ha ampliado el número de nasas legalmente utilizables por una embarcación de las 25 que se permitían en la Ley de 1986 a las 75 actuales (en el preámbulo de la Ley de 1986 se reconocía la situación de sobrepesca en que se encontraban los recursos, al tiempo que se planteaba una reducción progresiva de las 25 nasas permitidas hasta su total desaparición). Sin embargo este número está muy lejos aún del número medio real de las nasas desplegadas por las embarcaciones de pesca. Así, Hernández-García et al. (1998)

estimaron que la flota de Mogán manejaba una media de 275 nasas por embarcación a finales de la década de 1990, habiendo casos de pescadores que manipulaban un número próximo a 500 nasas. Esta capacidad de manejo de nasas, y el consiguiente aumento del poder de pesca, se vio enormemente favorecida por la incorporación de maquinillas (tornos) para levar las mismas. Recientemente, Couce-Montero (2009) estimó, por medio de encuestas, que el numero medio de nasas por barco en el mismo área de pesca ha disminuido considerablemente (180 unidades de media), consecuencia de una reducción del 65% en el tamaño de la flota operativa respecto a 1996. De forma similar, y para la vertiente Este-Sureste de la Isla, área con mucho menor flota operativa, Luque et al., (2009) estimaron que el número de nasas por embarcación casi duplica las legalmente permitidas en la actualidad, cifrándolas en 141,87 (SD=73,38) unidades por barco.

En el este de Gran Canaria, los pescadores profesionales faenan entre cuatro y seis días a la semana, obteniendo una captura media por jornada de pesca y barco que ronda los 20,05 kg.  $\text{día}^{-1}$  (SD= 13,72). Cada nasa obtiene un rendimiento que oscila entre los 0,04 y 2,05 kg.  $\text{nasa}^{-1}\text{día}^{-1}$ , con una valor medio de 0,22 kg.  $\text{nasa}^{-1}\text{día}^{-1}$  (SD= 0,16 kg.  $\text{nasa}^{-1}\text{día}^{-1}$ ) (Luque et al., 2009). En la vertiente sur, con una frecuencia de pesca similar, los rendimientos son prácticamente idénticos (0,218 kg.  $\text{nasa}^{-1}\text{día}^{-1}$ ), oscilando la captura por jornada de pesca entre 44 y 59 kg, dependiendo de la época del año y el área de pesca (Couce-Montero, 2009).

Las Islas Canarias, representan un punto turístico importante por las características que posee, por lo que hay un alto número de turistas durante todo el año. Una de las actividades demandadas en la pesca de altura (barcos de lista 6º), que se ha convertido en un negocio rentable, sobre todo en los puertos de las zonas turísticas donde hay una gran afluencia de turismo. Estos servicios, por lo general, de pesca de altura, en los que

buscan especies pelágicas grandes como marlines (isthiophoridae), pez espada (*Xiphias gladius*) atunes (Thunnus spp.; Katsuwonus pelamis), dorados (*Coryphaena hippurus*), petos (*Acanthocybium solandri*), etc., aunque también otras especies como tiburones y rayas. Este tipo de pesca se realiza generalmente en aguas exteriores, no muy alejadas de la plataforma insular, aunque su impacto sobre los recursos neríticos insulares no debe ser muy significativo ya que incide principalmente sobre especies que pasan próximas a las islas durante sus migraciones. Además, algunas de estas empresas practican la técnica de captura y suelta.

En Canarias no han existido planes estratégicos de actuación y regulación, a medio o largo plazo, orientados a la sostenibilidad, pero, paradójicamente, si han iniciado planes de renovación de la flota, aumento y/o modificación del poder de pesca, etc., sin tener en cuenta la situación de los recursos sometidos a pesca, y produciendo así una mayor presión para los recursos pesqueros.

Una de las diferencias más notables con respecto a 1984, es la presencia de los pescadores recreativos, por lo que si obtenemos las mismas capturas antes que ahora, y además tenemos la presión de los recreativos, hace que la presión ejercida sobre los recursos de la Isla sea muy elevada, extrayendo mucho más que hace 25 años, por lo que los rendimientos son mucho más bajos y las jornadas de pesca mayores. Este hecho se ha pasado por alto por parte de la Administración, ya que una buena gestión sería limitar en número o en tiempo la pesca recreativa en Gran Canaria, para intentar reducir la presión que se ejerce por parte de un sector, que al fin y al cabo es recreativo.

## **5. Conclusión**

En general, puede afirmarse que el sector pesquero profesional no ha logrado una adecuada adaptación a los cambios experimentados en las últimas décadas (pérdida de caladeros externos, expansión de la acuicultura, sobreexplotación de los stocks, falta de renovación generacional, crecimiento del sector de pesca deportiva). Los aspectos relacionados con la fase extractiva de la actividad (nuevas construcciones, modernización, equipamiento de puertos,...) han seguido contando con recursos financieros que, si bien han mejorado las condiciones de seguridad y trabajo, quizás no hayan sido atemperados como debieran frente a los cada vez más abundantes síntomas de una sobreexplotación del caladero.

Con el paso del tiempo, el sector se ha ido modernizando y han evolucionado hacia unas grandes infraestructuras, pero esta evolución no se ha visto reflejada en las capturas. Esto es síntoma de la falta de gestión y de una buena planificación ya que se ha invertido mucho en infraestructuras que están muy por encima de la capacidad de sostén del recurso. Esta sobredimensión del sector a lo único que conduce es a un aumento de gastos por parte de las cofradías, que tienen que seguir sufragando el mantenimiento de las instalaciones, equipamientos y maquinaria, utilizadas muchas veces por debajo del 50% de su capacidad.

La Administración ha mostrado signos de una falta de implicación y desidia a la hora de corregir las desviaciones citadas, al tiempo que diseñar, desarrollar y poner en práctica un plan de gestión acorde a la realidad del sector teniendo en cuenta el estado de los recursos y la capacidad de carga de los ecosistemas marinos insulares. Muy al contrario, ha adoptado por seguir un plan de subvenciones sin objetivos claros que permitan la sostenibilidad de la actividad pesquera a través de lograr la autonomía

financiera de las cofradías y cooperativas de pescadores, y que estas lleguen a ser corresponsables en la gestión de los recursos públicos a su disposición, incluidos los stocks de peces. No ha establecido los sistemas adecuados para cuantificar las capturas (se carece de datos procedentes de la pesca recreativa que pueden suponer casi el 50% del total desembarcado) y el esfuerzo realizado por la flota, necesarios para realizar una evaluación fiable del estado de los stock objetivo de la pesquería.

Fuera del sector pesquero, el turismo ha sido uno de los mayores beneficiarios del impacto de los fondos estructurales para la pesca, tanto por la utilización directa de infraestructuras destinadas inicialmente al sector pesquero (instalaciones portuarias y locales sociales), como por la mejora del entorno y creación de nuevos atractivos. El sector recreativo se ha aprovechado de todas estas infraestructuras portuarias, desarrollando en muchos de los casos un mayor uso que los pescadores profesionales, quedando estos últimos arrinconados, a expensas de cómo evolucione el sector recreativo. No obstante, estos últimos ayudan a mitigar el sobredimensionamiento de las infraestructuras pesqueras, aportando recursos económicos que sirven de auxilio para las cofradías.

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## Máster de Gestión Sostenible de Recursos Pesqueros

Arguineguín	Agaete	Mogán	Cast. Romeral	Melenara	San Cristóbal
<b>Social Data:</b>					
Nationality:	Age:		Studies:		
Nº of children:	Hours a day:		More usual working days:		
Alternative work:	Recreational fishing:		Months of more work:		
Years experience:	Secondary employment? Which?				
Formative courses:					
<b>Personal Opinion:</b>					
State of fisheries:					
Possible solutions:					
¿There are over-fishing?					
Fishing regulation:					
Subsidies:	Are they effectives?				
Who are they for?					
Who gives subsidies?					
How much?					
What that would lead?					
Who the would direct?					
<b>Marketing:</b>					
Who would sell the catch (brotherhood, hotels, bars, fish-market)?					
Do they buy all that fish?					
The price per kilo is fixed or variable?					
What determines the price?					
<b>Controls:</b>					
Do they make controls on fishing?					
Do you consider the minimum size?					
Do you agree with marine reserves?					
Where did you put?					
Agrees to create fish markets:					
<b>Opinion about:</b>					
Fisheries policy					
Aquaculture:					
First sale:					
FROM:					
Outfalls:					

# Anexo II

Infrastructures	Number/ Capacity	State of conservation	Use Level	Comments
Ramp				
Forklift				
Travelift				
Refrigerate vans				
Truck isothermal				
Rooms equipment				
Crane				
Fuel tank				
Reclycling center				
Ice Machine				
Cold store				
Store				
Office				
Computer support				
Meting Rooms				
Fishmarket				
Restaurant				
Port state				

Management of the brotherhood	Comments
Revenues	
Expenses	
Recruited staff	
Timetable	

**Comments:**

# Anexo III

<b>La Aldea</b>			nº 1
Municipality: San Nicolás de Tolentino	Lat: 27° 59' 6.13" N	Long: 15° 46' 50.28" W	
<b>Location, plan view and photo</b>			
			
<b>Specific data and services in the area</b>			
<u>General data:</u>  Breakwater: Yes Anchorage: Si Commercial / recreational / fishery: No/Yes/Yes Total area of the port: 23.000 m <sup>2</sup> . Sheltered waters area: 13.000 m <sup>2</sup> . Length of dam: 145 m. Number of recreational boating: 20-30. Number of professional vessels: 3 Accessibility: Good Buoying: Yes	<u>Infrastructures:</u>  Dams: 1 Pontoon: No Water / light: No Ramp: Yes Pit: No Grounding area: Yes Travelift: No Crane: No Recycling center: No Fuel tank: No Ice machine: No Cold storage: No Rooms equipment: No Offices: No Store: No Showers / Baths: No Brotherhood: No Restaurant: No Fish Market: No	<u>Services:</u>  First sale: No Surveillance: No Boat access by car: Yes	
<b>Commentaries</b>			
Are the old infrastructure of the old brotherhoods, Pescaldea.			

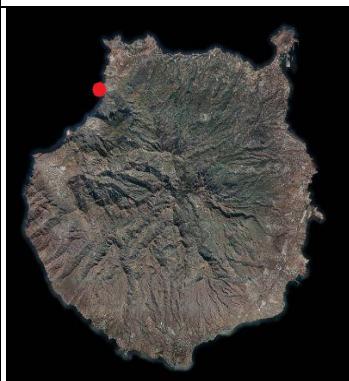
**Puerto de Las Nieve**

nº 2

Municipality: Agaete

Lat: 28° 6' 8" N

Long: 15° 42'44" W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes  
 Anchorage: No  
 Commercial / recreational / fishery:  
 Yes/Yes/Yes  
 Total area of the port:  
 75.654 m<sup>2</sup>.  
 Sheltered waters area:  
 43.000 m<sup>2</sup>.  
 Length of dam: 554 m.  
 Number of recreational boating: 121.  
 Number of professional vessels: 28.  
 Accessibility: Good  
 Buoying: Yes.

Infrastructures:

Dams: 2.  
 Pontoons: Yes.  
 Water / light: Yes.  
 Ramp: Yes.  
 Pit: Yes.  
 Grounding area: Yes.  
 Travelift: Yes.  
 Crane: Yes.  
 Recycling center: Yes.  
 Fuel tank: Yes.  
 Ice machine: Yes.  
 Cold storage: Yes.  
 Rooms equipment: Yes.  
 Offices: Yes.  
 Store: Yes.  
 Showers / Baths: No.  
 Brotherhood: Yes.  
 Restaurant: Yes.  
 Fish Market: Yes.

Services:

First sale: Yes.  
 Surveillance: Yes.  
 Boat access by car: Yes.

**Commentaries**

Good condition overall. Port shared between the company Fred Olsen, recreational and fishermen.

**Sardina del Norte**

nº3

Municipality: Gáldar

Lat: 28,154° N

Long: 15,699° W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
No/Yes/yes.  
Total area of the port: 26.000 m<sup>2</sup>.  
Sheltered waters area: 11.000 m<sup>2</sup>.  
Length of dam: 175 m (sum of three dams).  
Number of recreational boating: 30.  
Number of professional vessels: 2.  
Accessibility: Medium.  
Buoying: No.

Infrastructures:

Dams: 3.  
Pontoon: No.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: Si.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: Yes.

**Commentaries**

The number of boats anchored depends on season and sea conditions. High activity in the docks on weekends.

**El Altillo**

nº 4

Municipality: Moya	Lat: 28,146° N	Long: 15,565° W
<b>Location, plan view and photo</b>		
		
<b>Specific data and services in the area</b>		
<u>General data:</u>  Breakwater: No. Anchorage: No. Commercial / recreational / fishery: No/No/No. Total area of the port: - Sheltered waters area: - Length of dam: - Number of recreational boating: 0. Number of professional vessels: 0. Accessibility: Medium. Buoying: No.	<u>Infrastructures:</u>  Dams: No. Pontoon: No. Water / light: No. Ramp: Yes. Pit: No. Grounding area: No. Travelift: No. Crane: No. Recycling center: No. Fuel tank: No. Ice machine: No. Cold storage: No. Rooms equipment: No. Offices: No. Store: No. Showers / Baths: No. Brotherhood: No. Restaurant: No. Fish Market: No.	<u>Services:</u>  First sale: No. Surveillance: No. Boat access by car: Yes.
<b>Commentaries</b>		
Utilization negligible		

**El Puertillo**

nº 5

Municipality: Arucas

Lat: 28,150° N

Long: 15,535° W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
 Anchorage: No.  
 Commercial / recreational / fishery:  
 No/No/No.  
 Total area of the port: -  
 Sheltered waters area: -  
 Length of dam: -  
 Number of recreational boating: 15-20.  
 Number of professional vessels: No.  
 Accessibility: Buena.  
 Buoying: No

Infrastructures:

Dams: No.  
 Pontoons: No.  
 Water / light: No.  
 Ramp: No.  
 Pit: No.  
 Grounding area: No.  
 Travelift: No.  
 Crane: No.  
 Recycling center: No.  
 Fuel tank: No.  
 Ice machine: No.  
 Cold storage: No.  
 Rooms equipment: No.  
 Offices: No.  
 Store: No.  
 Showers / Baths: No.  
 Brotherhood: No.  
 Restaurant: No.  
 Fish Market: No.

Services:

First sale: No.  
 Surveillance: No.  
 Boat access by car: Yes.

**Commentaries**

All boats are on the sand. Usually ships not more than 5 meters.

**Peña La Vieja (Las Canteras)**

nº6

Municipality: Las Palmas de Gran Canaria	Lat: 28°08'14 N	Long: 15°26'17 W
<b>Location, plan view and photo</b>		
		

**Specific data and services in the area**

<u>General data:</u>	<u>Infrastructures:</u>	<u>Services:</u>
<p>Breakwater: No.</p> <p>Anchorage: Yes.</p> <p>Commercial / recreational / fishery: No/Yes/No.</p> <p>Total area of the port: -</p> <p>Sheltered waters area: -</p> <p>Length of dam: -</p> <p>Number of recreational boating: 18.</p> <p>Number of professional vessels: 0</p> <p>Accessibility: Medium.</p> <p>Buoying: No.</p>	<p>Dams: No.</p> <p>Pontoons: No.</p> <p>Water / light: No.</p> <p>Ramp: No.</p> <p>Pit: No.</p> <p>Grounding area: No.</p> <p>Travelift: No.</p> <p>Crane: No.</p> <p>Recycling center: No.</p> <p>Fuel tank: No.</p> <p>Ice machine: No.</p> <p>Cold storage: No.</p> <p>Rooms equipment: No.</p> <p>Offices: No.</p> <p>Store: No.</p> <p>Showers / Baths: No.</p> <p>Brotherhood: No.</p> <p>Restaurant: No.</p> <p>Fish Market: No.</p>	<p>First sale: No.</p> <p>Surveillance: No.</p> <p>Boat access by car: No.</p>

**Commentaries**

Half of the boats are on the sand. Usually they are in the sand does not exceed 5meters. Highly dependent on sea conditions and season.  
 Boats on the sand: 5-8  
 Boats in the water: 5-10.

**La Puntilla (Las Canteras)**

nº 6

Municipality: Las Palmas de  
Gran Canaria

Lat: 28°08'52 N

Long: 15°25'56 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
No/Si/Si.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: -  
Number of recreational boating: 40-60.  
Number of professional vessels: -  
Accessibility: Good.  
Buoying: No.

Infrastructures:

Dams: No.  
Pontoon: No.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: Yes.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: No.

**Commentaries**

Vessels found on the sand of Las Canteras, in the anchorage area and in front of the restaurant La Marinera.

Boats on the sand: 30-40

Boats in the water: 15-20

Boats in front of the restaurant "La Marinera": 5-10

**Club Náutico de Las Palmas**

nº 7

Municipality: Las Palmas de Gran Canaria	Lat: 28°08'02 N	Long: 15°25'36 W
<b>Location, plan view and photo</b>		
		

**Specific data and services in the area**

<u>General data:</u>	<u>Infrastructures:</u>	<u>Services:</u>
<p>Breakwater: Yes.          Anchorage: No.          Commercial / recreational / fishery:          No/Yes/No.          Total area of the port: 54.000 m<sup>2</sup>.          Sheltered waters area: 29.000 m<sup>2</sup>.          Length of dam: 434 m.          Number of recreational boating: 120-140.          Number of professional vessels: -          Accessibility: Good.          Buoying: Yes.</p>	<p>Dams: 1.          Pontoons: Yes.          Water / light: Yes.          Ramp: Yes.          Pit: Yes.          Grounding area: Yes.          Travelift: Yes.          Crane: Yes.          Recycling center: Yes.          Fuel tank: No.          Ice machine: No.          Cold storage: No.          Rooms equipment: No.          Offices: No.          Store: Yes.          Showers / Baths: Yes.          Brotherhood: No.          Restaurant: No.          Fish Market: No.</p>	<p>First sale: No.          Surveillance: Si.          Boat access by car: Yes.</p>

**Commentaries**

It has many of the machines that the marina in Las Palmas also has.

**Fondeadero de Las Alcaravaneras**

nº 7

Municipality: Las Palmas de  
Gran Canaria

Lat: 28°07'52 N

Long: 15°25'35 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
 Anchorage: Yes.  
 Commercial / recreational / fishery:  
 No/Si/NO.  
 Total area of the port: -  
 Sheltered waters area:  
 148.000 m<sup>2</sup>.  
 Length of dam: -  
 Number of recreational boating: 20-30.  
 Number of professional vessels: -  
 Accessibility: Good.  
 Buoying: No.

Infrastructures:

Dams: No.  
 Pontoons: No.  
 Water / light: No.  
 Ramp: No.  
 Pit: No.  
 Grounding area: No.  
 Travelift: No.  
 Crane: No.  
 Recycling center: No.  
 Fuel tank: No.  
 Ice machine: No.  
 Cold storage: No.  
 Rooms equipment: No.  
 Offices: No.  
 Store: No.  
 Showers / Baths: No.  
 Brotherhood: No.  
 Restaurant: No.  
 Fish Market: No.

Services:

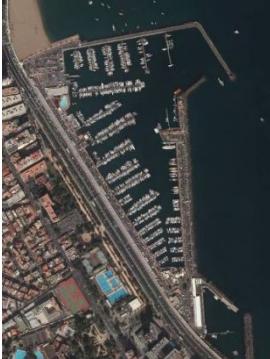
First sale: No.  
 Surveillance: No.  
 Boat access by car: No.

**Commentaries**

There are boats on the water and some on the sand not exceeding 4 meters.  
 Usually ships are sailing and are the type that is anchored there seasonally.

**Muelle Deportivo de Las Palmas**

nº 7

Municipality: Las Palmas de Gran Canaria	Lat: 28°07'38 N	Long: 15°25'32 W
<b>Location, plan view and photo</b>		
		
<b>Specific data and services in the area</b>		
<u>General data:</u>  Breakwater: Yes. Anchorage: No. Commercial / recreational / fishery: No/Yes/No. Total area of the port: 272.600 m <sup>2</sup> . Sheltered waters area: 144.000 m <sup>2</sup> . Length of dam: 570 m. Number of recreational boating: 1.187. Number of professional vessels: - Accessibility: Good. Buoying: Yes.	<u>Infrastructures:</u>  Dams: 2. Pontoons: Yes. Water / light: Yes. Ramp: Yes. Pit: Yes. Grounding area: Yes. Travelift: Yes. Crane: Yes. Recycling center: Yes. Fuel tank: Yes. Ice machine: No. Cold storage: No. Rooms equipment: No. Offices: Yes. Store: Yes. Showers / Baths: Yes. Brotherhood: No. Restaurant: No. Fish Market: No.	<u>Services:</u>  First sale: No. Surveillance: Si. Boat access by car: Si.
<b>Commentaries</b>		
Large marina with many infrastructures for recreation. The surrounding area is a great shopping, restaurants, discos, dive centers, ...		

**San Cristóbal**

nº 8

Municipality: Las Palmas de  
Gran Canaria

Lat: 28°04'33 N

Long: 15°24'50 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
No/No/Si.  
Total area of the port: 12.500 m<sup>2</sup>.  
Sheltered waters area: 5.000 m<sup>2</sup>.  
Length of dam: 86 m.  
Number of recreational boating: 15  
Number of professional vessels: 9.  
Accessibility: Medium.  
Buoying: Yes.

Infrastructures:

Dams: 1  
Pontoons: No.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: Yes.  
Travelift: No.  
Crane: Yes.  
Recycling center: Yes.  
Fuel tank: Yes.  
Ice machine: Yes.  
Cold storage: Yes.  
Rooms equipment: Yes.  
Offices: Yes.  
Store: Yes.  
Showers / Baths: No.  
Brotherhood: Yes.  
Restaurant: Yes.  
Fish Market: No.

Services:

First sale: Yes.  
Surveillance: No.  
Boat access by car: Yes.

**Commentaries**

Dam very small. The operation of the dock greatly influenced by weather conditions. The dam in disrepair and many remains of "traps". Good area of grounding.

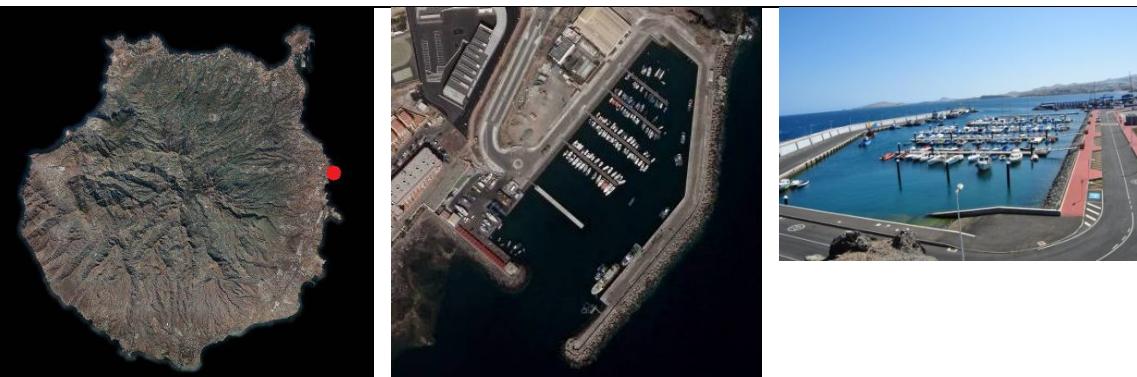
**Muelle de Taliarte**

nº 9

Municipality: Telde

Lat: 27°59'23 N

Long: 15°22'06 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
 Anchorage: No.  
 Commercial / recreational / fishery:  
 Yes/Yes/Yes.  
 Total area of the port: 49.000 m<sup>2</sup>.  
 Sheltered waters area: 27.000 m<sup>2</sup>.  
 Length of dam: 329 m.  
 Number of recreational boating: 160.  
 Number of professional vessels: 18.  
 Accessibility: Good.  
 Buoying: Yes.

Infrastructures:

Dams: 1.  
 Pontoon: Yes.  
 Water / light: Yes.  
 Ramp: Yes.  
 Pit: Yes.  
 Grounding area: Yes.  
 Travelift: Yes.  
 Crane: Yes.  
 Recycling center: Yes.  
 Fuel tank: Yes.  
 Ice machine: Yes.  
 Cold storage: Yes.  
 Rooms equipment: Yes.  
 Offices: Yes.  
 Store: Yes.  
 Showers / Baths: No.  
 Brotherhood: Yes.  
 Restaurant: Yes.  
 Fish Market: No.

Services:

First sale: Yes.  
 Surveillance: Yes.  
 Boat access by car: Yes.

**Commentaries**

Coexist fishing, commercial (aquaculture), recreational and research.

**Tufia**

nº 10

Municipality: Telde	Lat: 27°57'42 N	Long: 15°22'46 W
<b>Location, plan view and photo</b>		
		
<b>Specific data and services in the area</b>		
<u>General data:</u>  Breakwater: No. Anchorage: Yes. Commercial / recreational / fishery: No/Yes/No. Total area of the port: - Sheltered waters area: - Length of dam: - Number of recreational boating: 15-25. Number of professional vessels: - Accessibility: Medium Buoying: No.	<u>Infrastructures:</u>  Dams: No. Pontoons: No. Water / light: No. Ramp: Yes. Pit: No. Grounding area: No. Travelift: No. Crane: No. Recycling center: No. Fuel tank: No. Ice machine: No. Cold storage: No. Rooms equipment: No. Offices: No. Store: No. Showers / Baths: No. Brotherhood: No. Restaurant: No. Fish Market: No.	<u>Services:</u>  First sale: No. Surveillance: No. Boat access by car: No.
<b>Commentaries</b>		
Small natural bend, where boats are anchored in the shelter of the waves. The occupation depends on the season.		

**Playa Ojos de Garza**

nº 11

Municipality: Telde	Lat: 27°57'00 N	Long: 15°22'44 W
<b>Location, plan view and photo</b>		
		

**Specific data and services in the area**

<u>General data:</u>	<u>Infrastructures:</u>	<u>Services:</u>
Breakwater: No. Anchorage: No. Commercial / recreational / fishery: No/Yes/No. Total area of the port: - Sheltered waters area: - Length of dam: - Number of recreational boating: 4-8. Number of professional vessels: - Accessibility: - Buoying: No.	Dams: No. Pontoon: No. Water / light: No. Ramp: No. Pit: No. Grounding area: No. Travelift: No. Crane: No. Recycling center: No. Fuel tank: No. Ice machine: No. Cold storage: No. Rooms equipment: No. Offices: No. Store: No. Showers / Baths: No. Brotherhood: No. Restaurant: No. Fish Market: No.	First sale: No. Surveillance: No. Boat access by car: No.

**Commentaries**

On this beach the boats are on the sand and break in and take a hand.

**Playa El Burrero**

nº 12

Municipality: Ingenio	Lat: 27°54'41 N	Long: 15°23'10 W
<b>Location, plan view and photo</b>		
		
<b>Specific data and services in the area</b>		
<u>General data:</u>  Breakwater: No. Anchorage: No. Commercial / recreational / fishery: No/Yes/Yes. Total area of the port: - Sheltered waters area: - Length of dam: - Number of recreational boating: 8-12. Number of professional vessels: 3. Accessibility: Medium. Buoying: No.	<u>Infrastructures:</u>  Dams: No. Pontoon: No. Water / light: No. Ramp: No. Pit: No. Grounding area: No. Travelift: No. Crane: No. Recycling center: No. Fuel tank: No. Ice machine: No. Cold storage: No. Rooms equipment: Yes. Offices: No. Store: No. Showers / Baths: No. Brotherhood: No. Restaurant: No. Fish Market: No.	<u>Services:</u>  First sale: No. Surveillance: No. Boat access by car: No.
<b>Commentaries</b>		
On this beach the boats are on the sand and break in and take a hand. All that exists are a few equipment rooms. Presence of professional vessels.		

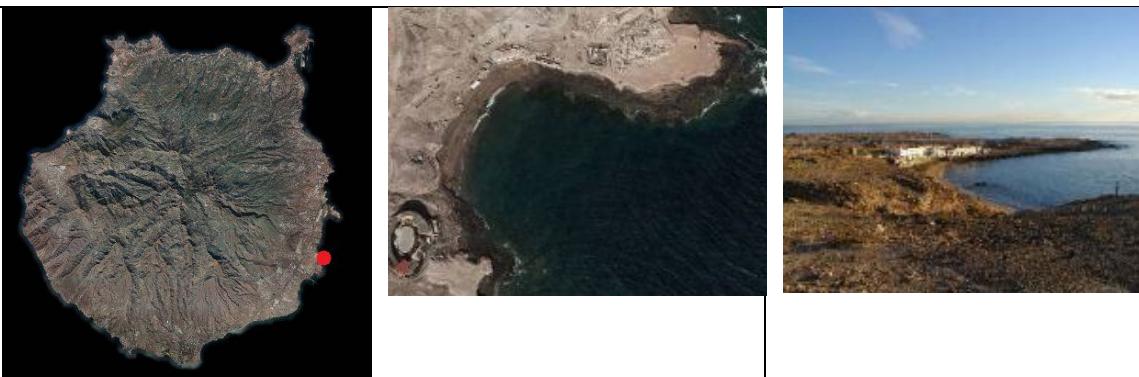
**El Cabróñ**

nº 13

Municipality: Agüimes

Lat: 27°52'16 N

Long: 15°23'07 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: -  
Number of recreational boating: 2-6.  
Number of professional vessels: No.  
Accessibility: Bad  
Buoying: No.

Infrastructures:

Dams: No.  
Pontoon: No.  
Water / light: No.  
Ramp: No.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: No.

**Commentaries**

On this beach the boats are on the sand and break in and take a hand. Access to the area is bad. There is no signage in the area.

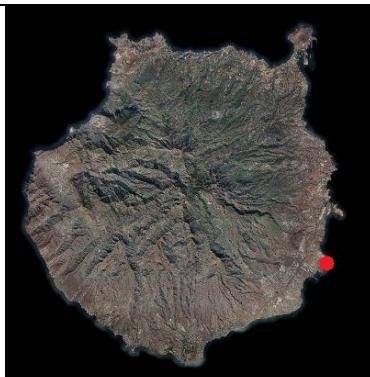
**Arinaga (Risco Verde)**

nº 14

Municipality: Agüimes

Lat: 27°51'26 N

Long: 15°23'13 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: -  
Number of recreational boating: -  
Number of professional vessels: -  
Accessibility: Medium.  
Buoying: No.

Infrastructures:

Dams: No.  
Pontoon: No.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: No.

**Commentaries**

There is only one slipway, the utilization is almost zero because it gives the promenade and is not accessible by car.

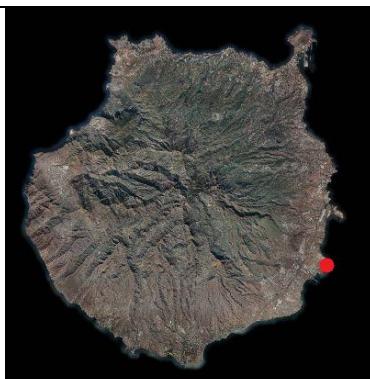
**Arinaga (pueblo)**

nº 14

Municipality: Agüimes

Lat: 27°51'20 N

Long: 15°23'42 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: 65 m.  
Number of recreational boating: -  
Number of professional vessels: -  
Accessibility: Good  
Buoying: Yes.

Infrastructures:

Dams: 1.  
Pontoon: No.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: No.

**Commentaries**

In this area the boats get into the sea by hand.

**Arinaga (Muelle)**

nº 15

Municipality: Agüimes

Lat: 27°50'55 N

Long: 15°24'17 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
 Anchorage: No.  
 Commercial / recreational / fishery:  
 Yes/No/Yes.  
 Total area of the port: 404.000 m<sup>2</sup>.  
 Sheltered waters area: 200.000 m<sup>2</sup>.  
 Length of dam: 1, 16 km.  
 Number of recreational boating: 0.  
 Number of professional vessels: 2.  
 Accessibility: Medium.  
 Buoying: Yes

Infrastructures:

Dams: 1.  
 Pontoons: No.  
 Water / light: No.  
 Ramp: No.  
 Pit: No.  
 Grounding area: No.  
 Travelift: No.  
 Crane: No.  
 Recycling center: No.  
 Fuel tank: No.  
 Ice machine: No.  
 Cold storage: No.  
 Rooms equipment: No  
 Offices: No.  
 Store: Yes.  
 Showers / Baths: No.  
 Brotherhood: No.  
 Restaurant: No.  
 Fish Market: No.

Services:

First sale: No.  
 Surveillance: No.  
 Boat access by car: No.

**Commentaries**

Only one family that is dedicated to professional fishing with 2 boats. All they have is a winch for the grounding of the vessel.

**Castillo del Romeral**

nº 16

Municipality: San Bartolomé de Tirajana

Lat: 27°47'46 N

Long: 15°27'49 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
No/Yes/Yes.  
Total area of the port: 49.000 m<sup>2</sup>.  
Sheltered waters area: 24.000 m<sup>2</sup>.  
Length of dam: 359 m.  
Number of recreational boating: 42.  
Number of professional vessels: 20.  
Accessibility: Good  
Buoying: Yes.

Infrastructures:

Dams: 1.  
Pontoon: Yes.  
Water / light: No.  
Ramp: Yes.  
Pit: No.  
Grounding area: Yes.  
Travelift: No.  
Crane: Yes.  
Recycling center: Yes.  
Fuel tank: Yes.  
Ice machine: Yes.  
Cold storage: No.  
Rooms equipment: Yes.  
Offices: Yes.  
Store: No.  
Showers / Baths: No.  
Brotherhood: Yes.  
Restaurant: Yes.  
Fish Market: No.

Services:

First sale: Yes.  
Surveillance: No.  
Boat access by car: Yes.

**Commentaries**

Many recreational boats on the sand that are abandoned or badly damaged.

**Playa del Águila**

nº 17

Municipality: San Bartolomé  
de Tirajana

Lat: 27°46'38 N

Long: 15°31'35 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: -  
Number of recreational boating: 2-4.  
Number of professional vessels: 0.  
Accessibility: Good.  
Buoying: No.

Infrastructures:

Dams: No.  
Pontoon: No.  
Water / light: No.  
Ramp: No.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: Yes.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: No.

**Commentaries**

Many boats on the sand. They only have a small store in poor condition.

**Puerto Deportivo de Pasito Blanco**

nº 18

Municipality: San Bartolomé  
de Tirajana

Lat: 27°44'48 N

Long: 15°37'25 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: 67.800 m<sup>2</sup>.  
Sheltered waters area: 37.000 m<sup>2</sup>.  
Length of dam: 417 m.  
Number of recreational boating: 388.  
Number of professional vessels: 0.  
Accessibility: Good  
Buoying: Yes.

Infrastructures:

Dams: 1.  
Pontoon: Yes.  
Water / light: Yes.  
Ramp: Yes.  
Pit: Yes.  
Grounding area: Yes.  
Travelift: Yes.  
Crane: Yes.  
Recycling center: Yes.  
Fuel tank: Yes.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: Yes.  
Store: Yes.  
Showers / Baths: Yes.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: Yes.  
Boat access by car: Yes.

**Commentaries**

In the surrounding there are a variety of shops and restaurants, diving center, repair, ...

**El Pajar**

nº 19

Municipality: Mogán

Lat: 27°45'12 N

Long: 15°40'14 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: No.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: -  
Sheltered waters area: -  
Length of dam: -  
Number of recreational boating: 40.  
Number of professional vessels: 0.  
Accessibility: Good.  
Buoying: No.

Infrastructures:

Dams: No.  
Pontoon: No.  
Water / light: No.  
Ramp: No.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: No.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: No.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: Yes.

**Commentaries**

There are 15-25 recreational boats on the sand in front of the bar "El Boya". In the sand between 4 and 8, and on the beach the fund 5 to 10 recreational vessels. There is a small car access on the beach the fund in which you can in and out boats.

**Puerto de Arguineguín**

nº 20

Municipality: Mogán

Lat: 27°45'26 N

Long: 15°41'06 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: Yes.  
Commercial / recreational / fishery:  
Yes/Yes/Yes.  
Total area of the port: 77.000 m<sup>2</sup>.  
Sheltered waters area: 33.000 m<sup>2</sup>.  
Length of dam: 413 m.  
Number of recreational boating: 171.  
Number of professional vessels: 60.  
Accessibility: Good.  
Buoying: Yes.

Infrastructures:

Dams: 1.  
Pontoon: Yes.  
Water / light: Yes.  
Ramp: Yes.  
Pit: Yes.  
Grounding area: Yes.  
Travelift: Yes.  
Crane: Yes.  
Recycling center: Yes.  
Fuel tank: Yes.  
Ice machine: Yes.  
Cold storage: Yes.  
Rooms equipment: Yes.  
Offices: Yes.  
Store: Yes  
Showers / Baths: No.  
Brotherhood: Yes.  
Restaurant: Yes.  
Fish Market: No.

Services:

First sale: Yes.  
Surveillance: Yes.  
Boat access by car: Yes.

**Commentaries**

This dock is one of the stops of the tour boats that run between Arguineguín, Puerto Rico, and Mogán.

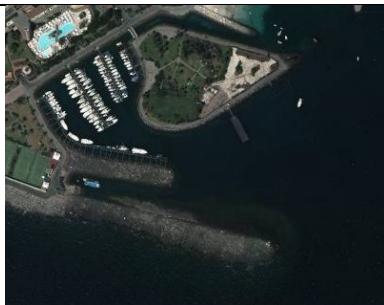
**Muelle Deportivo Anfi del Mar**

nº 21

Municipality: Mogán

Lat: 27°46'16 N

Long: 15°41'51 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: No.  
Commercial / recreational / fishery:  
No/Yes/No.  
Total area of the port: 33.400 m<sup>2</sup>.  
Sheltered waters area: 17.500 m<sup>2</sup>.  
Length of dam: 238 m.  
Number of recreational boating: 89.  
Number of professional vessels: 0.  
Accessibility: Good.  
Buoying: Yes.

Infrastructures:

Dams: 2.  
Pontoon: Yes.  
Water / light: Yes.  
Ramp: Yes.  
Pit: No.  
Grounding area: No.  
Travelift: No.  
Crane: No.  
Recycling center: Yes.  
Fuel tank: No.  
Ice machine: No.  
Cold storage: No.  
Rooms equipment: No.  
Offices: No.  
Store: No.  
Showers / Baths: Yes.  
Brotherhood: No.  
Restaurant: No.  
Fish Market: No.

Services:

First sale: No.  
Surveillance: No.  
Boat access by car: Yes.

**Commentaries**

Access to beach the boats is complicated.

**Puerto Rico (puerto Base)**

nº 22

Municipality: Mogán	Lat: 27°46'54 N	Long: 15°42'42 W
<b>Location, plan view and photo</b>		
		
<b>Specific data and services in the area</b>		
<u>General data:</u>  Breakwater: Yes. Anchorage: No. Commercial / recreational / fishery: Yes/Yes/No. Total area of the port: 84.200 m <sup>2</sup> . Sheltered waters area: 44.000 m <sup>2</sup> . Length of dam: 426 m. Number of recreational boating: 340. Number of professional vessels: 0. Accessibility: Good. Buoying: Yes.	<u>Infrastructures:</u>  Dams: 1. Pontoon: Yes. Water / light: Yes. Ramp: Yes. Pit: Yes. Grounding area: Yes. Travelift: Yes. Crane: No. Recycling center: Yes. Fuel tank: Yes. Ice machine: No. Cold storage: No. Rooms equipment: No. Offices: Yes. Store: Yes. Showers / Baths: Yes. Brotherhood: No. Restaurant: No. Fish Market: No.	<u>Services:</u>  First sale: No. Surveillance: Yes. Boat access by car: Yes.
<b>Commentaries</b>		
The surrounding area is a great variety of tourist activities.		

**Puerto Rico (puerto Escala)**

nº 22

Municipality: Mogán

Lat: 27°46'59 N

Long: 15°42'54 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
 Anchorage: No.  
 Commercial / recreational / fishery:  
 Yes/Yes/No.  
 Total area of the port: 23.000 m<sup>2</sup>.  
 Sheltered waters area: 14.200 m<sup>2</sup>.  
 Length of dam: 213 m.  
 Number of recreational boating: 220.  
 Number of professional vessels: 0.  
 Accessibility: Good.  
 Buoying: Yes.

Infrastructures:

Dams: 1.  
 Pontoons: Yes.  
 Water / light: Yes.  
 Ramp: Yes.  
 Pit: No.  
 Grounding area: Yes.  
 Travelift: No.  
 Crane: No.  
 Recycling center: Yes.  
 Fuel tank: No.  
 Ice machine: No.  
 Cold storage: NO.  
 Rooms equipment: No.  
 Offices: Yes.  
 Store: Yes.  
 Showers / Baths: Yes.  
 Brotherhood: No.  
 Restaurant: No.  
 Fish Market: No.

Services:

First sale: No.  
 Surveillance: Yes.  
 Boat access by car: Yes.

**Commentaries**

The surrounding area is a wide range of tourist activities. This dock is one of the stops of the tour boats that run between Arguineguín, Puerto Rico, and Mogán.

**Puerto de Mogán**

nº 23

Municipality: Mogán

Lat: 27°48'59 N

Long: 15°45'53 W

**Location, plan view and photo****Specific data and services in the area**General data:

Breakwater: Yes.  
Anchorage: No.  
Commercial / recreational / fishery:  
Yes/Yes/Yes.  
Total area of the port: 50.000 m<sup>2</sup>.  
Sheltered waters area: 37.000 m<sup>2</sup>.  
Length of dam: 504 m.  
Number of recreational boating: 216.  
Number of professional vessels: 21.  
Accessibility: Good.  
Buoying: Yes.

Infrastructures:

Dams: 1.  
Pontoon: Yes.  
Water / light: Yes.  
Ramp: Yes.  
Pit: Yes.  
Grounding area: Yes.  
Travelift: Yes.  
Crane: Yes.  
Recycling center: Yes.  
Fuel tank: Yes.  
Ice machine: Yes.  
Cold storage: Yes.  
Rooms equipment: Yes.  
Offices: Yes.  
Store: Yes.  
Showers / Baths: Yes.  
Brotherhood: Yes.  
Restaurant: Yes.  
Fish Market: No.

Services:

First sale: Yes.  
Surveillance: Yes.  
Boat access by car: Yes.

**Commentaries**

This dock is one of the stops of the tour boats that run between Arguineguín, Puerto Rico, and Mogán.