

Why a town as small as Bermeo is the tuna world capital?

Ugalde Zabala, R., Sámano Cobián, Z., Sigüenza Tamayo, W. and Arana Landin, S. ⁽¹⁾

(1) *University of the Basque Country (UPV/EHU).
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Abstract

Bermeo is a small town in the north of the Iberian Peninsula, cradle of a purse seiner of undisputed global relevance. Since the time of the Romans, it was recognized for its port, which led it to be one of the first three villages that were founded in the former Lordship of Biscay, even holding the title of "Head of Biscay". Currently, 52 of the 678 large-scale purse seine vessels that sail in all the waters of the world are controlled from the offices located in this town. In 2018, the last year for which FAO has published data on global catches, the 52 purse seiner vessels that were then controlled by companies based in Bermeo fished 10.40% of all world catches of the approximately 50 species of registered tuna.

Focusing the investigation, those 52 ships that approximately account for 6.27% of the large-scale purse seiner fleet fished in 2018 10.40% of the tropical tunas (skipjack, yellowfin and bigeye). For all this this town is the tuna world capital.

Introduction

In the eastern part of the Cantabrian Sea, the town of Bermeo is located, a paradigm of fishing activity since time immemorial. Historically, it has been one of the most important fishing ports of the Cantabrian coast due to its ancestral relationship with fishing, an activity that has always been linked to overcoming and risk. Currently, Bermeo's fishing activity is centered on two poles; on the one hand, inshore fishing, which like the inshore subsector as a whole has suffered a strong decline, and high seas fisheries, specifically the purse seiner subsector, of which it is undoubtedly a world reference, hence the Bermeo Tuna World Capital (BTWC) project.

Throughout this study we will make a journey through time, always relating Bermeo and the most important events that took place with a marine connection. Thus, we will begin in the Ancient Age, with the first Roman vestiges. We will continue in the Middle Ages, where the first written references to Bermeo were made and where the first round-the-world trip took place in the transition to the Modern Age. We will finish with the Contemporary Age, where so many changes took place, changing the secular way of

activity of the sailors of Bermeo. Finally, we will come to the present, where we will see why Bermeo is the tuna capital of the world.

First references from the past

The existence of Bermeo in Roman times is reflected by the discovery of several coins and various fragments of terra sigillata (Ybarra and Bergé, 2003, p. 174; Erkoreka, 1997, pp. 310-311). In the same way, for Martínez Menaya (1994, p. 81) there was no doubt that the Romans used the port of Bermeo, given the existence of a road coming from Balmaseda that crossed the valley of the Kadagua, the estuary of Bilbao and whose end was the fishing village that is the subject of this study.

The end of the Roman stay in Bermeo came, according to Carretié González (1992, p. 287), in the 5th century A.D., after a maritime attack by the Herulian pirates in 456 A.D. There are only different hypotheses about the period up to the first written references, although there seems to be no doubt, despite the lack of documentary support, about the Viking presence on the Cantabrian coast for two centuries, from the beginning of the 9th century to the beginning of the 11th century (Dúo, 1988, p. 308; Erkoreka, 1995, pp. 14-15). During the Viking stay in the Bay of Biscay, according to Erkoreka (2006, pp. 26-27), the coastal population abandoned the coast to retreat inland due to waves of Viking attacks. After this period of instability, and as a consequence of the considerable decrease in Viking maritime raids at the end of the 9th and beginning of the 10th centuries, the population began to return to the coast.

A century later, the first documentary references appeared. The third of the documents, dated 1082 is in our opinion the most important due to its link with the sea. This document states:

unum monasterium reliquiis ferente S. Vicenti de Uarthe, in termino Bizcai, cum tres decanías, una Ibargorocica, eta alia decanía que vocitant Tuda cum sua medietate, et illa ecclesia San Micaelis arcangeli in portu de Vermelio, in ora maris, cum suos morturos ad illa pertinente.

It is a donation from the Lords of Bizkaia to the monastery of San Juan de la Cogolla, of the church or hermitage of San Miguel together with the monastery of San Vicente de Ugarte and the deaneries of Ibargorocica and Tuda. However, what differentiates this document from many other similar ones is that a port of the peninsular Basque Country is mentioned for the first time. This shows, as Martínez Menaya (1994, p. 81) affirms, its importance in the Lordship of Biscay and is evidence that the port and the settlement were prior to that date. In addition, according to Huidobro and Serna (1951) in Martínez Menaya (1994, p. 81) at that time there were ports of entry to the peninsula, of which the most important was Bermeo, which some pilgrims used to join the Camino de Santiago in Bilbao through the general road.

Except for another donation of another church, that of Albóniga, in 1093 until its foundation as a town when it received the Fuero of Logroño, there is no other documentation related to Bermeo, either because they were not written, were lost or burned in the seven devastating fires that the town has suffered throughout its history. Consequently, the lack of documentation prevents the knowledge and interpretation of the processes that were carried out at the time.

The exact date of when Bermeo was granted a town charter is unknown, but it must have been between 1214, the year in which the Lords of Biscay, Lope Diaz II de Haro "Cabeza

brava" and his consort Urraca Alfonsa, married, and 1236 or 1239, the year in which Lope Diaz II de Haro died. In any case, Bermeo was one of the first five towns to become villas, namely Balmaseda (1199), Urduña (1229), Otxandiano (1254) and Lanestosa (1287), although it should be noted that it was the only one that was not a land gateway to the Lordship. In the words of García de Cortázar Ruiz de Aguirre and Montero García (1980, p. 39) the creation of the villas occurred in response to an important change in international trade that would strengthen the area and meant the reconversion of the fundamental axis of relations with Castile.

From its foundation as a town, Bermeo developed substantially. Until the middle of the 14th century it was an important commercial center and the main port of the Lordship. It even became *caput Vizcaiae*, i.e. "Head of Biscay", officially from 1476 to 1602, although in practice it can be affirmed that it was so some time before.

On the other hand, one of the first mentions of the appearance of Basque fishermen in the Bay of Biscay is dated January 3, 1282 (Zabala eta Otxamiz-Tremoya, 2000 II, p. 289). It was a permission granted by Lope de Haro together with Prince Don Sancho of Castile to the Bermean seafarers to salt in the ports of Asturias and Galicia, which evidences the early presence of the Bermeans in those lands.

Years later, with the development of the Galician fishing companies, the confrontations between Galicians and outsiders, among which were the Basques, intensified, to the point that in 1503 the Catholic Monarchs confirmed a privilege that the Bermeans had to "ir a todos los puertos de Galicia a tomar y llevar libremente dellos gueldo con que se ceba e pesca la sardina para pescar con ello en puertos de Vizcaya" (Alberdi Lonbide and Aragón Ruano, 2006, p. 80).

Little by little, the fishermen of Bermeo began to explore new fishing grounds, such as the Canary Islands, Ireland and Brittany, among others.

Such was the prestige of Bermeo's fishermen that Juan Ruíz, Archpriest of Hita, in his well-known work "Libro del Buen Amor", when describing the fight between Don Carnal and Doña Cuaresma, alludes to the herring and sea bream from Bermeo to swell the latter's ranks: "Fecho era el pregón del año jubileo, para salvar sus almas avían todos deseo, quantos son en la mar vinieron al torneo, arenques et besugos vinieron de Bermeo" (stanza 1112 of the Book of Good Love). Although Arocena (1964, p. 12) considers that these herrings were not fished by Bermeans, but were merchandise transported from the Hansa. Be that as it may, two important conclusions can be drawn from the quotation of the Archpriest of Hita; first, it shows that the fish products of Bermeo were recognized for their quality in the Castilian plateau; and second, it points to the considerable degree of development that the fishing industry had already acquired by that time.

There is another fact of capital importance worldwide. We are talking about the first round-the-world voyage in which Bermeo was the town in the Basque Country that contributed the most crew members (specifically, 7 people) to the expedition, and the fourth at the state level behind Seville (21), Huelva (12) and Palos (8) (Mazón Serrano, 2022). In the words of Zulaika (2019) "the Bermeo crew constituted the nucleus on which Juan Sebastián Elcano relied on the *nao Concepción*". It is worth mentioning the boatswain Juan de Acurio "with whom Elcano coincided in the preparations for Seville, they set sail together and together they returned on the *Nao Victoria*" (ibid.).

The seven crew members from Bermeo were mostly seafarers, although there was also a carpenter and a caulker. Of these, six set sail on the *nao Concepción*, captained by Juan

Sebastián Elkano. Four died, one returned with the San Antonio and two -the boatswain Juan de Acurio and the page Pedro de Chindarza- sailed around the world (ibid.).

The first major changes

According to Erkoreka Gervasio (1991, p. 22), coastal fishing remained essentially intact until the 18th century, conserving the essence of medieval times. As long as the Basque whalers fished in Newfoundland, of which we have found no links with the Bermeo sailors, inshore fishing activity continued to be characterized by a cyclical productive calendar, where the calendar year was divided into different coastal areas, that is, a productive calendar was established that was repeated year after year. In the Modern Age, sea bream and sardines continued to be the pillars of the fishing economy, with species such as albacore or hake at a lower level (Gracia Cárcamo, 1996, p. 191).

From the second half of the 18th century, things began to change. The Enlightenment and, later, the French Revolution brought a change of mentality, the passage to a new ideology: political and economic liberalism. This new thinking clashed with the group feeling internalized century after century in the coastal population, which materialized in the fishermen's guilds. Until then, the fishermen's guilds was still the axis of the fishing community, which constituted an anachronism within the historical context that followed the Liberal Revolution, since this theoretically entailed the abolition of all guilds of medieval origin and freedom of establishment, through the CCLXII Decree of June 8, 1813, approved by the Cortes de Cadiz. However, these measures did not affect the basque fishermen's guilds, given the peculiar legal situation of the Basque Country. The fishermen's guilds managed to resist, not without suffering numerous attacks and threats, the organization and control of the activity until March 22, 1873, after which the Maritime Registration Law came into force, abolishing the institution of the Matrícula de Mar. This law brought the liberation of the maritime industry, in the words of Lledó Martín (1943, p. 19), "for all Spaniards". It therefore broke up the productive bases on which the Basque fishing communities had been settled for centuries, which, according to López Losa (2002, p. 11) "meant the disappearance of the exclusive fishing rights that the fishermen's guilds had enjoyed on the Basque coast". Nevertheless, the fishermen's guild scheme will be maintained for many years. Even today, whose main role is to participate in the fishing sector as an organ of consultation and support of the Administration, the fishermen's guilds act beyond their own attributions, exercising functions more typical of other types of entities within the current map: Producers' Organizations, Business Associations and Trade Unions.

After the liberalization of the sector, anyone who wanted to fish outside the protection of the fishermen's associations had the door open to them. This, together with a new propulsion technology, steam, favored the appearance and subsequent development of the first trawler fleet in the Basque Country, a new fishing model that had nothing to do with the traditional forms, much more developed than these, with a clear capitalist character.

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With the entry of trawlers, sea bream and hake gradually disappeared. Consequently, the winter coasts, which had existed since time immemorial, ceased to exist almost in their

entirety, thus putting an end to a secular productive calendar. While with respect to hake the impact of trawling leaves no room for doubt, as the few fishing grounds for this species were depleted, in the case of sea bream it does not seem so clear, although it is likely that trawling destroyed its habitat.

Until that time, the mainstays of the economy were those considered to be high seas fisheries: sea bream, hake and, to a lesser extent, albacore (López Losa, 2000a, pp. 328-329). For centuries, sea bream was the most profitable fish and constituted the main fishery on the Basque coast. It could be marketed both pickled and fresh. As this fish was caught in winter, it was easy to transport to inland markets. On the other hand, albacore, which was caught in the summer, could not withstand the high temperatures, which greatly accelerated its putrefaction, so it was mainly processed in pickled fish. Hake, on the other hand, was only marketed fresh, since all attempts to treat or cure it failed, which reduced its profitability, despite being, according to López Losa (2000b, p. 241), "perhaps the most profitable fishery" from the point of view of the fresh price.

On the other hand, the inshore species, mainly sardines and anchovies, were of little importance to the fishing community. Over time, the former lost the importance it once had, either because of its low profitability or because of competition from the Galician sardine. The second, however, until the appearance of the Italian canners, was considered a marginal fishery.

The entry of the Catalan and, above all, Italian canners, the latter coming from the main industrial centers of the country, such as Genoa, Livorno, Alessandria and Turin, essentially (Escudero Domínguez, 2007, p. 45), "revolutionized the extractive and production sector" (Escudero Domínguez, 2000, p. 315). Both came in search of anchovies that had declined in the eighties of the nineteenth century in Mediterranean waters. With the entry of these canners, "a new method of preservation was introduced (not because it was unknown but because it was scarcely used) applied fundamentally to a species that was not highly valued, such as the anchovy" (Escudero Domínguez, 2005, pp. 5-6).

Escudero Domínguez (2000, p. 316), cites the Catalan José Vilá y Carbó and the Genoese firm Angelo Parodi as the first ones in 1884 and 1886, respectively, although no other author establishes reliably the date on which these canners arrived in the Basque ports, perhaps due to the type of activity itself, since they were installed temporarily in the fishing localities during the time that the coastal fishing season lasted, from mid-March to the end of June.

Years later, well into the 20th century, the Sicilian canners arrived and "although they were not the pioneers in the establishment, they were the true animators and promoters of the salting activity throughout the northern part of Spain" (Escudero Domínguez, 2000, p. 318). They brought with them an important innovation, the preparation of anchovy fillet, which meant:

a de facto change in the structure of the company, since it will require more space for storage during the curing period, tanks for the oil and sealing machines for the finalization of the product. At the same time, this dedication will mean an increase in the number of working days, going from being open only during the anchovy harvest (April-June) to being occupied during the autumn-winter months (Escudero Domínguez, 2007, p. 96).

Thus, with the Sicilians, the salting establishments became canneries.

However, anchovies became one of the most desired species, although in Bermeo "albacore was as important or even more so" (López Losa, 2008, p. 13). In addition, over time, the different subspecies of tuna would become by far the main product of the canning factories, making them the main clients of the fishermen and demanders of large quantities of fish, especially tuna. However, until the 1960s, the Spanish canning sector presented, among others, the following deficiencies:

- a serious problem of atomization, due to the large number of small companies,
- the financial weakness of the companies, together with the small size of the companies,
- the underutilization of a large part of its facilities, as a result of the seasonal nature of the species it had been processing until then,
- problems in foreign markets, especially in Italy,
- and an excessive specialization in certain species with a high degree of variability, as in the case of albacore and anchovy, species that were also highly perishable, which forced the companies to be located near the ports, given the fact that refrigerators were not yet in use (Ugalde Zabala, 2014, p. 59).

All the shortcomings of the canning sector came to light after the Stabilization Plan of 1959, which exacerbated the crisis that the canning sector was suffering, and this led to a reduction in the number of manufacturers in Spain. In European countries with free economies, there was an effort to mechanize processes and introduce economies of scale, which led to the disappearance of the less powerful companies (Escudero Domínguez, 2008, p. 13).

In light of this evidence, the Spanish canning industry began to restructure, taking as a reference the North American canning industry, which increased in scale based on tropical tuna species (skipjack and yellowfin tuna), which guaranteed a larger and more stable supply, using freezing for this purpose (Carmona Badía, 2012, p. 13). However, this was not synonymous with a reduction in production, quite the contrary (see Ugalde Zabala, 2014).

Consequently, some modern Spanish canneries began to consume and process these new types of tuna throughout the year, thus solving the problem of the seasonality characteristic of the canning sector until then.

In this way, more and more people began to opt for tuna, because, as they say, "it offered great mechanization possibilities,

It offered possibilities of mechanization far superior to those of traditional products, possibilities which, thanks to the greater continuity of supply and better cold storage capabilities, made the investment necessary for its implementation attractive (Carmona Badía and Fernández González, 2001, p. 14).

This was possible as a result of the results of the so-called Dakar Campaigns.

The great leap

As the 20th century progressed, improvements of all kinds were made to vessels (see Ugalde Zabala, 2014). In addition, a series of state aids were given that favored the construction of new vessels. These aids were: the Naval Credit Law (June 2, 1939), the Law for the Protection and Reconstruction of the National Fleet (December 31, 1939), the Law on the Granting of Loans to Fishermen (December 22, 1949) and, subsequently,

the Law for the Renewal and Protection of the Fishing Fleet (December 23, 1961) and the guidelines included in the successive Development Plans (Uriarte Ayo, 2021, p. 31).

Thus, the 1939 Law "fundamentally favored the high sea trawl fisheries" (López Losa, 2000b, p. 262), although the inshore fleet of Bermeo grew abruptly (Prado Antúnez, 2000, p. 336), establishing itself in a leading position compared to other coastal localities.

This substantial development of the fishing sector did not take long to cause problems. In this sense, "the Bay of Biscay was starting to become too small for the professional concerns and needs of our fishermen" (Ferarios Lázaro, 2013, p. 52). New challenges had to be sought to respond to this problem, while "surviving the hardships of winter" (ibid.). Thus, based on the successful results achieved by French vessels in an experimental campaign in 1955 in the waters of the African Atlantic, 8 intrepid Bermeo vessels set sail for those waters, after signing a contract with the Canary Islands canning company Unión Conservera, thus initiating one of the most brilliant pages of Basque fishing history, known as the "Dakar campaigns", and thus breaking with the work cycles that had existed until then.

The Dakar campaigns marked a milestone in the development and internationalization of Basque tuna fishing and contributed to the great expansion of the sector in Spain in the 1960s. The "economic miracle" of that decade, together with the Development Plans and the Law for the Renewal and Protection of the Fishing Fleet of 1961, contributed to the modernization of a fleet that quantitatively reached more units than France and the United Kingdom combined (Ferarios Lázaro, 2013, p. 54).

Nine campaigns were carried out uninterruptedly in West African waters, in which participated mainly, vessels from Bermeo, although also some from Lekeitio, Elantxobe, Ondarroa, Mutriku, Orio and Hondarribia. Although the base port of operations changed as the exploration extended towards the Gulf of Guinea, they were forever referred to as "The Dakar Campaigns".

Although in the first campaigns they worked for Canary Island canneries, later they also worked for Italian and North American companies. The results obtained in each of the campaigns were uneven (Ferarios Lázaro, 2013).

Throughout these nine campaigns, the limitations that appeared were frequent, among others, those of the port infrastructures that made the use of refrigerated transport ships inevitable for the transfer of the catches, as well as those of the ships themselves that were used in terms of techniques for refrigeration and maintenance of the catches, which made it very difficult to extend the radius of action.

Thus, the 1964-1965 campaign turned out to be the last one for this type of vessels as a consequence, among others, of:

The leonine fishing contracts with the American canneries, the limitations of the vessels themselves, together with the apparent recovery of the Cantabrian coast. Nor should we forget the introduction, precisely in the latter, of the novel technique of tuna fishing with purse seine nets (Ferarios Lázaro, 2013, p. 16).

In the words of Uriarte Ayo (2021, pp. 178-179):

the Dakar campaigns pushed the possibilities of an artisanal fleet and methods to the limit, contributing decisively to the accumulation of new knowledge, resources, business capabilities and contact networks necessary to intervene in an early globalized and intensely competitive market.

The Dakar campaigns marked the beginning of today's modern large-scale purse seine vessels. Thus, in the words of Ferarios Lázaro (2013, p. 121):

The tuna purse seine fleet was born after a decade in which the fishermen of the Bermean inshore gave their all, spending more time at sea than at home; and perhaps without being aware of it, specializing in a fishery of which today they can be proud.

Industrialization of the sector

Parallel to the Dakar campaigns, the first steps were taken towards the industrialization of the tuna sector, as a consequence of a radical change in the business structures and the strong technological implementation on board.

The first attempts at a tuna purse seiner on the west coast of Africa date back to the end of 1960. Specifically, it was the Californian tuna purse seine vessel *May Queen*, which sailed for two years in those waters. A year later, in 1961, the French vessel *Curlinka*, one of the three vessels that carried out the experimental campaigns of 1955, already adapted to the purse seine system, carried out its first campaign off the coast of Sierra Leone. Although it was a clipper, it did not have a freezing system on board. And another year later, in 1962, the first Spanish purse seiner arrived. Named *Marinero*, it came from Galicia. It was a ship built in 1957 initially as a gunboat, although shortly after it was converted into a purse seiner at the Astilleros y Talleres del Noroeste (Astano) in Ferrol (Uriarte Ayo, 2021, pp. 55-56).

The results obtained by the *Marinero* were not very successful (Ferarios Lázaro, 2013, p. 92), hence "soon after it would be dismantled to dedicate itself to the type of fishing for which it was designed" (Santiago Burrutxaga and Ferarios Lázaro, 2012, p. 46).

It was already 1964 when the first successful trips of some large-scale tuna purse seine vessels of the Spanish state that would use the purse seine system appeared, specifically the *Alboniga* and the *Alacrán*. Since then, the tuna purse seine fleet has been growing rapidly. In this regard, according to Diaz De la Paz (2012, p. 496) by 1968, the Cooperativa de Armadores de Atuneros Congeladores (COPATUN) of Bermeo, controlled a fleet of 12 freezer tuna vessels, who unloaded in the ports of Freetown (Sierra Leone) and Tema (Ghana) "4,890.8 tons of tuna and skipjack tuna".

By 1969 a report of the Inter-American Tropical Tuna Commission (IATTC) already warned that "most of the new vessels (Spanish and French) fishing for tuna in the Atlantic Ocean have the capacity to fish in any world ocean" (IATTC Annual Report, 1969, p. 58 in Uriarte Ayo, 2021, p. 57).

Thus, Uriarte Ayo (2021, p. 57) states:

although in this initial phase the fishery focused almost exclusively on the African coasts of the Atlantic, from the 1970s onwards, in a still limited way, there was a first extensive process that extended the activity to the East Pacific. With more uncertain and scarce information and figures than those available for the Atlantic, the first record of a Spanish tuna vessel in the IATTC, based in Ecuador, operating in the East Pacific is from 1970. It is the tuna purse seiner *Garrido Primero*.

The fleet continued to grow and modernize, at the same time as the first limits of the exploited areas were emerging. In this context, we must not forget the institutional

problem that the gradual establishment of territorial waters at 200 miles entailed, although it does not seem to have meant a breakdown of the territorial waters,

it does not seem to have meant a significant disruption for the fleet, at least not of the intensity that was registered in the remaining high sea and distant fisheries, but it forced the modification of fishing strategies and the negotiation of bilateral agreements with the coastal countries (Uriarte Ayo, 2021, p. 69).

In this sense, joint ventures, private agreements and the use of third-country flags became widespread. This is attested to in a report by a financial institution:

this fleet is solving the 200-mile problem: on the one hand, avoiding fishing in jurisdictional waters, and on the other hand, it has signed agreements with the countries it is approaching in some way. During 1980 two agreements were signed, one with Senegal and the other with Angola (Caja Laboral Popular, Basque Economy, 1980 Report, p. 365 in Uriarte Ayo, 2021, p. 69).

All this, together with the increase in demand and international competition, made it necessary to continue searching for new fishing grounds.

Thus, in 1981, two baitboats, the *Nuevo Madre del Cantábrico*, with home port Getaria, and the *Bahía de Santoña*, with home port in that Cantabrian town, contracted by the Spanish Administration to carry out a prospecting campaign, set sail in May of that year for the Seychelles, in the waters of the Western Indian Ocean. In the first three months, very poor results were obtained, mainly due to the monsoon winds, but also to the problems encountered in the search for good bait. With the inter-monsoon calm (from the end of September to December) and the desired bait found, "the boats began to fish in quantities never imagined" (Cort, 2012, p. 41). The news soon spread, and so in November 1981 the first large-scale tuna purse seiner, the French vessel *Yves de Kerguelen*, also with the idea of prospecting the area, made its appearance. The results obtained, both by the Spanish pole-and-line vessels and by the French purse seiner, were the reason why the French Association of Tuna Purse Seine Vessels did not take long to sign a fishing agreement with the Seychelles Administration. Thus, in October 1982, there were already four French tuna purse seiners operating in Indian waters to carry out another exploration campaign. The results were also very favorable. Thus, in the campaign that began on November 4, 1983 and ended on January 10, 1984, 11 French large-scale tuna purse seine vessels fished off Seychelles.

In view of these results, the Spanish fisheries authorities hastened to sign a tuna fishing agreement with the Seychelles government in October 1983. As a consequence, there was a significant shift of the fleet from the Atlantic Ocean to the Indian Ocean (Soto Ruiz, 2006, p. 13). Thus, by March 1984, 14 tuna purse seine vessels of Spanish interest, 7 of which flew the Spanish flag, were operating along those coasts. Initially, they sailed in Seychellois waters, although shortly after, they prospected the Kenyan coasts and, later, the Somali coasts, where "they obtained spectacular catches" (Lozano, 2011, p. 36).

During the following years, some purse seine vessels fished, depending on their interests, both in the Atlantic and Indian Oceans, although as the years went by, each vessel settled in a single fishing ground, leaving for the Indian Ocean "the largest units, as well as the new vessels built", while in the Atlantic "the oldest and smallest vessels" fished (Lozano, 2011, p. 36).

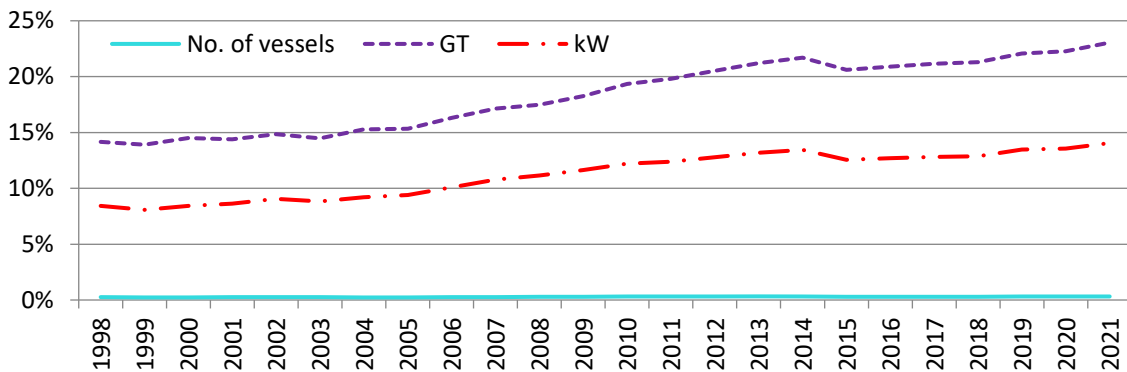
From the mid-1990s, and following the agreement reached by the Organization of Associated Producers of Large Tuna Freezers (OPAGAC) and the Republic of Kiribati, the vessels under Spanish interest extended the fishing area to the entire Pacific.

To this day, large-scale tuna purse seine controlled by Spanish interests continue to operate in those waters of the East Pacific, although, as of the mid-1990s, they were able to extend their fishing zone to the entire Pacific as a result of the agreement they reached (Morón, Areso and Pallarés, 2001, p. 2).

Large-scale tuna purse seine vessels today

According to data published by the Ministry of Agriculture, Fisheries and Food (MAPA) at the close of the 2021 financial year there were 8,732 vessels of multiple sizes registered in Spanish territory, dedicated to different types of fishing and operating in different fishing grounds. Of these, 28 were large-scale tuna purse seine vessels operating in tropical waters around the world. These tuna purse seine vessels represented only 0.32% of the total Spanish fleet. However, their relative weight increases considerably in terms of power (measured in kW); thus, the total kW of the purse seine tuna fleet under the Spanish flag represented 14.05 % of the total Spanish power; and furthermore, the total tonnage of the purse seine tuna fleet accounts for 23.05 % of the total tonnage (measured in GT) of the Spanish fleet as a whole (*Graph 1*).

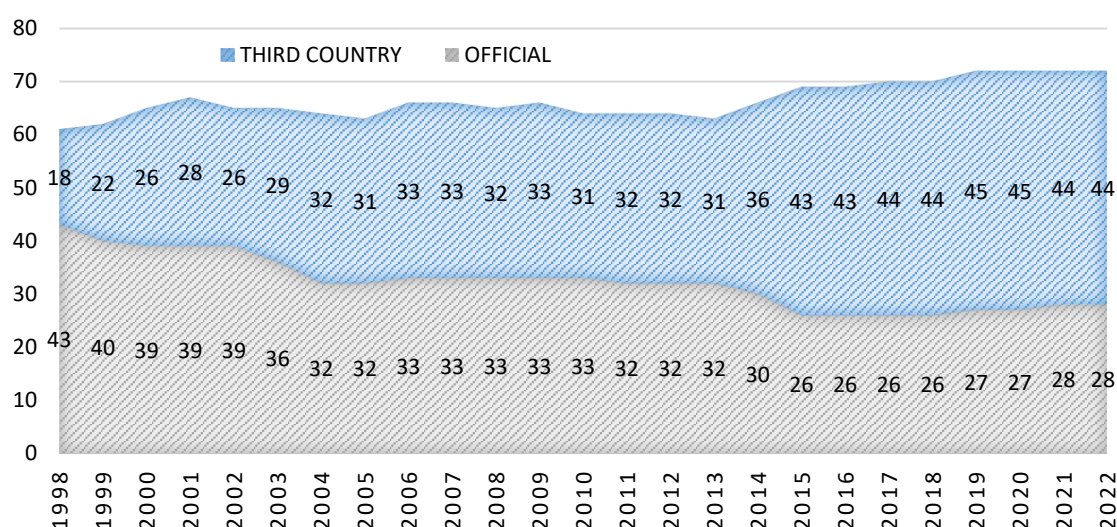
Graph 1. Representation of the tuna purse seine subsector with respect to the total Spanish fleet.



Source. Own elaboration

However, as can be seen in these data, reference is only being made to the purse seine tuna fleet under the Spanish flag. In this sense, Graph 2 shows the number of vessels controlled in the last 20 years by the companies that were part of the National Association of Tuna Freezer Vessel Ship-owners (ANABAC) or OPAGAC. This graph shows an inverse behavior in terms of vessels flying the Spanish flag, the official ones according to MAPA, and those operating under the flag of a third country. In this sense, the number of vessels under third country flag has increased notoriously, going from 28 to 43, although it must be taken into account that at the end of 2010 a business group was integrated in OPAGAC owner of 5 vessels, all under foreign flag; while, the officially Spanish vessels have decreased in terms of number of units, although, the total cargo capacity has practically not seen its potential reduced, going from 75.976 GT in 2001 to 75,326 GT in 2022 (explained in detail for the period 1997-2013 in Ugalde Zabala, 2014).

Graph 2. Tuna freezer fleet controlled by Spanish interests



Source. Own elaboration

Thus, at the end of 2021, the companies comprising the two associations controlled a total of 71 freezer tuna vessels. Table 1 shows the number of vessels per company, as well as their flag and the oceans in which these vessels sail. The company groups marked in gray have their control center in Bermeo, the one marked in brown is controlled from the neighboring town of Lekeitio, and the blue one, 50% from La Coruña and Bermeo. In total, and without a doubt, 52 large-scale tuna purse seine vessels are controlled from Bermeo, that is, 73.24% of the fleet included in both associations.

Table 1. List of large-scale tuna purse seine vessels by company, flag and oceans.

| Company | Flag | | Total | Oceans | | |
|-----------------------------------|-----------|---------------|-----------|-----------|-----------|-----------|
| | Spain | Third Country | | Atlantic | Indian | Pacific |
| Albacora | 6 | 11 | 17 | 5 | 8 | 4 |
| Inpesca | 4 | 3 | 7 | 1 | 6 | |
| Atunsa | 5 | 2 | 7 | 4 | 3 | |
| Echebastar | 3 | 3 | 6 | | 6 | |
| Pevasa | 4 | 4 | 8 | 3 | 5 | |
| Garavilla | 2 | 2 | 4 | | | 4 |
| Nicra 7 | 1 | 1 | 2 | 2 | | |
| C ^a Europea de Túnidos | 1 | 0 | 1 | | 1 | |
| Txopituna | 0 | 5 | 5 | | | 5 |
| Ugavi | 0 | 4 | 4 | | | 4 |
| Uniocean El Salvador | 0 | 1 | 1 | | | 1 |
| Grupo Calvo | 1 | 6 | 7 | 5 | | 2 |
| Jealsa-Rianxeira | 0 | 2 | 2 | 2 | | |
| TOTAL | 27 | 44 | 71 | 22 | 29 | 20 |

Source. Own elaboration

Only one of the 13 business groups affiliated to OPAGAC or ANABAC is present in all three oceans, eight others focus all their efforts on only one ocean and the rest, four, operate in two oceans.

The 71 vessels under Spanish interest have an average age of 25.07 years, a size of 2,616.63 GT and a power of 4,068.36 kW (Table 2).

Table 2. Characteristics of tuna freezer vessels

| TOTAL | | | | | |
|----------|-------|----------------|----------|----------|----------|
| | | No. of vessels | | 71 | |
| AGE | | TONNAGE | | POWER | |
| Mean | 25,07 | Mean | 2.616,63 | Mean | 4.068,36 |
| Mode | 8 | Mode | 2737 | Mode | 3238 |
| Variance | 13,61 | Variance | 846,37 | Variance | 1.206,82 |

Source. Own elaboration

As can be seen in *Table 1*, 22 vessels were fishing in the Atlantic Ocean in 2021, 29 in the Indian Ocean and 20 in the Pacific. *Table 3* shows that, coincidentally, the average age of the 22 vessels in the Atlantic and 20 in the Pacific coincides, 28.27 years, and 39 years is the most repeated value in both oceans. On the other hand, the age of the Indian Ocean vessels decreases significantly to 18.72 years. In terms of gross tonnage and average power, the same pattern is repeated: the Atlantic vessels are the smallest and least powerful, followed by those in the Pacific, while those in the Indian Ocean are the newest, largest and most powerful of all the purse seine tuna fleet under Spanish interest.

Table 3. Characteristics of tuna purse seine vessels

| ATLANTIC | | INDIAN | | PACIFIC | |
|----------------|----------|----------------|----------|----------------|----------|
| No. of vessels | 22 | No. of vessels | 29 | No. of vessels | 20 |
| AGE | | AGE | | AGE | |
| Mean | 28,27 | Mean | 18,72 | Mean | 28,27 |
| Mode | 39 | Mode | 8 | Mode | 39 |
| Variance | 14,10 | Variance | 10,59 | Variance | 11,22 |
| TONNAGE | | TONNAGE | | TONNAGE | |
| Mean | 2.096,14 | Mean | 3.211,40 | Mean | 2.569,07 |
| Mode | 2058 | Mode | 2737 | Mode | 2165 |
| Variance | 600,60 | Variance | 731,70 | Variance | 786,86 |
| POWER | | POWER | | POWER | |
| Mean | 3.491,88 | Mean | 4.871,78 | Mean | 3.939,47 |
| Mode | 3237,62 | Mode | 4500 | Mode | 3238 |
| Variance | 1087,31 | Variance | 1.003,45 | Variance | 1108,19 |

Source. Own elaboration

These 71 large-scale tuna purse seine vessels may seem a small number. Nothing could be further from the truth. Thus, according to Justel-Rubio and Recio (2022, p. 9) in July 2022 there were 1,808 tuna purse seiners in the world, ranging in size from 7.1 to 116 meters, engaged in purse seine fishing. Of these, only 642 were large-scale purse seiners targeting tropical tuna (*Table 4*), the target species of the tuna purse seine vessels analyzed in this research. Hence, 11.06% of this fleet is controlled by companies affiliated to both associations, and if we stick to Bermeo, the percentage decreases slightly to 8.10% of the world purse seine tuna fleet; even so, an absolutely revealing percentage of the importance that this town has in the world in terms of tuna fishing.

Table 4. Number of large-scale tuna purse seine vessels in the world

| | <i>Flag</i> | <i>Vessels</i> | <i>FHV</i> | | <i>Flag</i> | <i>Vessels</i> | <i>FHV</i> |
|----|---------------|----------------|------------|----|--------------|----------------|------------|
| 1 | Ecuador | 83 | 78.285 | 21 | Marshall | 12 | 18.906 |
| 2 | Mexico | 48 | 60.401 | 22 | Solomon | 8 | 4.633 |
| 3 | Korea, Rep | 43 | 55.074 | 23 | Belize | 8 | 8.610 |
| 4 | Philippines | 44 | 46.248 | 24 | Kiribati | 9 | 12.172 |
| 5 | Indonesia | 31 | 11.148 | 25 | Senegal | 7 | 10.436 |
| 6 | Chinese T. | 31 | 54.087 | 26 | El Salvador | 6 | 11.019 |
| 7 | Panama | 26 | 37.978 | 27 | Tuvalu | 6 | 9.525 |
| 8 | Japan | 23 | 32.255 | 28 | Vanuatu | 7 | 13.597 |
| 9 | Spain | 27 | 54.446 | 29 | Iran | 4 | 7.316 |
| 10 | FS Micronesia | 26 | 38.708 | 30 | Nicaragua | 5 | 7.316 |
| 11 | Venezuela | 22 | 29.236 | 31 | Curaçao | 4 | 7.008 |
| 12 | France | 21 | 30.705 | 32 | Morocco | 4 | 1.955 |
| 13 | China, P.R. | 20 | 28.088 | 33 | Mauritius | 3 | 4.730 |
| 14 | Nauru | 20 | 30.785 | 34 | Guatemala | 2 | 3.702 |
| 15 | Ghana | 17 | 25.733 | 35 | Cook Islands | 1 | 1.160 |
| 16 | USA | 16 | 26.473 | 36 | Italy | 1 | 1.790 |
| 17 | Peru | 13 | 6.799 | 37 | New Zealand | 1 | 1.273 |
| 18 | Colombia | 13 | 14.590 | 38 | Guinea | 1 | 1.222 |
| 19 | Papua New | 15 | 18.038 | 39 | Tanzania | 1 | 3.500 |
| 20 | Seychelles | 13 | 25.320 | | TOTAL | 642 | 834.267 |

Source: Justel-Rubio and Recio (2022, p. 11)

It has been noted that the 642 vessels included in *Table 4* target tropical tunas, i.e. skipjack, yellowfin and bigeye tuna. These species account for only 3 of the nearly 50 that make up the tuna family. Together with albacore tuna and bluefin tuna, both known as temperate tunas, they are the most commercial tuna species. Thus, *Table 5* shows the total tuna catches according to FAO for the period 2011-2018, a period for which it has been possible to obtain the catches of most of the vessels operating in those years within the two associations with data from the companies themselves. Thus, worldwide in 2018, 7,973,008 tons of all types of tuna were caught, of which 5,315,238 corresponded to the 5 most commercial species and, sharpening even more, 5,034,240 to tropical tunas, thus highlighting the low representativeness of temperate tunas, with only 280,998 tons having been caught worldwide in 2018.

Table 5. Global tuna catches, 2011-2018, in tons

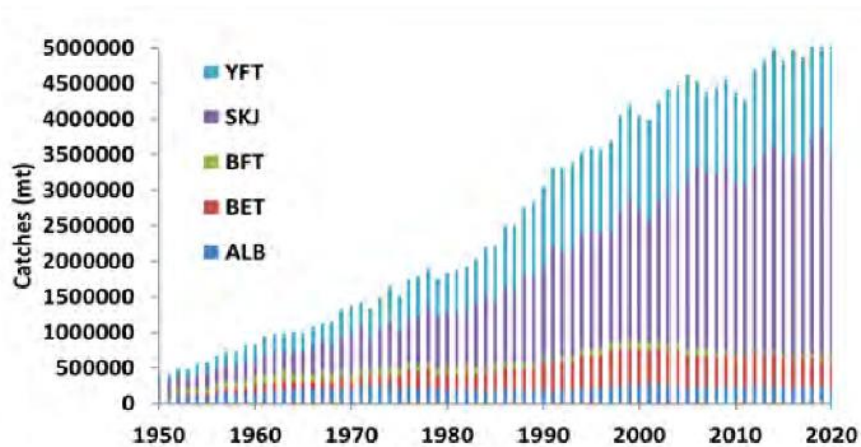
| Species | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Albacore (ALB) | 221.389 | 258.175 | 243.960 | 235.052 | 233.688 | 214.900 | 232.184 | 226.082 |
| Bluefin Tuna (BFT) | 42.667 | 35.826 | 36.411 | 41.620 | 42.209 | 47.298 | 53.408 | 54.916 |
| Bigeye (BET) | 381.128 | 428.468 | 401.087 | 404.308 | 423.357 | 397.760 | 380.656 | 414.872 |
| Skipjack (SKJ) | 2.442.341 | 2.597.648 | 2.797.597 | 2.997.296 | 2.821.698 | 2.861.826 | 2.784.911 | 3.161.308 |
| Yellowfin (YFT) | 1.139.374 | 1.277.818 | 1.239.736 | 1.337.339 | 1.376.863 | 1.479.477 | 1.513.237 | 1.458.060 |
| Total tropical tunas | 3.962.843 | 4.303.934 | 4.438.420 | 4.738.943 | 4.621.918 | 4.739.063 | 4.678.804 | 5.034.240 |
| Total 5 most commercial species | 4.226.899 | 4.597.935 | 4.718.791 | 5.015.615 | 4.897.815 | 5.001.261 | 4.964.396 | 5.315.238 |

| | | | | | | | | |
|----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Total tunas (approx. 50 species) | 6.675.261 | 7.095.717 | 7.235.780 | 7.517.170 | 7.710.773 | 7.790.548 | 7.765.803 | 7.913.008 |
|----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|

Fuente: FAO (n.d.)

So, of the nearly 8 million tons that in 2018 were fished in the world of the approximately 50 species of tuna that exist, 63.62% corresponded to only three species, those known as tropical tunas, that is, skipjack, yellowfin and bigeye tuna, the target species of the large-scale tuna purse seine vessels.

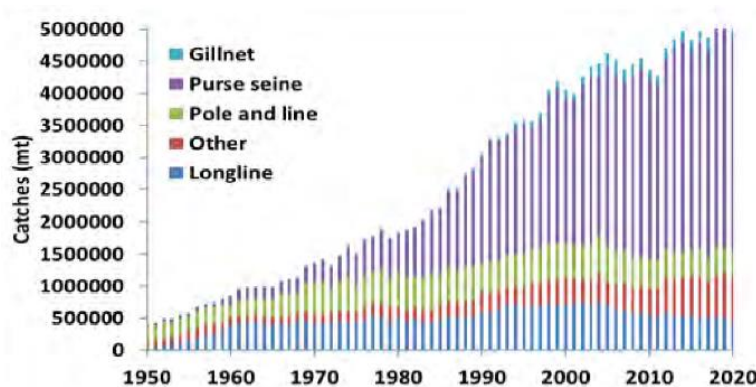
Graph 3. Global trends in catch (tonnes) of major commercial tunas, by species, 1950-2020



Source: ISSF (2022a, p. 22)

Graph 3 shows the trend in catches from 1950, the first year for which FAO has data, to 2020. As can be seen, it seems that in the 2010s the peak has been reached, hence in recent years catches of the five most commercial tuna species have been around 5 million tons.

Graph 4. Global trends in catch (tonnes) of major commercial tunas, by gear, 1950-2020



Source: ISSF (2022a, p. 22)

Graph 4 shows the fishing system used to catch the 5 most commercial tuna species in the period 1950-2020. Thus, although the purse seine system was practically insignificant until the 1970s, since then it has become the fishing gear par excellence. According to the ISSF (2022a, p. 22), 66% of the catches were made with tuna purse seines, that is, with the system used by large-scale tuna purse seine vessels. In other words, the 1,808 purse

seiners in July 2022, according to Justel-Rubio and Recio (2022, p. 9), are the ones catching 66% of the tuna of the five most commercial species.

Table 6. Catches of large-scale tuna purse seine controlled by Spanish interest in the world, 2012-2018.

| | TOTAL CONTROLLED FLEET | | | | | | |
|----------------|------------------------|----------|----------|----------|----------|----------|----------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Total catches | 427.584 | 478.378 | 506.191 | 488.039 | 553.786 | 570.730 | 594.326 |
| No. of vessels | 54 | 53 | 63 | 62 | 65 | 63 | 66 |
| Catches/vessel | 7.918,22 | 9.026,01 | 8.034,78 | 7.871,60 | 8.519,78 | 9.059,21 | 9.004,94 |

Source. Own elaboration

Moreover, the ISSF (2022b, n.p.) concludes through the work of Justel-Rubio and Recio (2022) that large-scale tuna purse seine vessels (642 vessels) fished about 70% of the world catches of tropical tuna (excluding bluefin tuna and albacore).

Through the data emanating from the companies owning vessels with Spanish interests, *Table 6* has been formulated, where the catches of most of these vessels are collected, for the period 2012-2018. Thus, for example, in 2018 Spanish companies controlled 70 vessels (*Table 2*), of which, reliable catch data for 66 (*Table 6*) vessels have been obtained. So, in 2018 these 66 vessels fished 594,326 tons, which represents 11.80% of the total world catches of tropical tuna, with each vessel fishing an average of 9,004.94 tons in 2018.

Table 7. Catches of large-scale tuna purse seine vessels controlled by Spanish interest, by oceans, 2012-2018.

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------|----------|----------|-----------|----------|----------|-----------|-----------|
| <i>ATLANTIC</i> | | | | | | | |
| Total catches | 123.968 | 139.447 | 167.291 | 158.466 | 203.206 | 188.404 | 193.573 |
| No. of vessels | 17 | 17 | 26 | 24 | 27 | 25 | 27 |
| Catches/vessel | 7.292,24 | 8.202,79 | 6.434,28 | 6.602,75 | 7.526,14 | 7.536,15 | 7.169,37 |
| <i>INDIAN</i> | | | | | | | |
| Total catches | 145.542 | 186.011 | 185.671 | 195.236 | 237.527 | 263.094 | 306.178 |
| No. of vessels | 20 | 19 | 22 | 25 | 25 | 25 | 25 |
| Catches/vessel | 7.277,09 | 9.790,05 | 8.439,57 | 7.809,44 | 9.501,09 | 10.523,77 | 12.247,12 |
| <i>PACIFIC</i> | | | | | | | |
| Total catches | 158.074 | 152.920 | 153.229 | 134.337 | 113.053 | 119.232 | 94.575 |
| No. of vessels | 17 | 17 | 15 | 16 | 13 | 13 | 14 |
| Catches/vessel | 9.298,47 | 8.995,29 | 10.215,27 | 8.396,06 | 8.696,38 | 9.171,69 | 6.755,36 |

TOTAL 427.584 478.378 506.191 488.039 553.786 570.730 594.326

Source. Own elaboration

Table 7 shows the above data broken down by ocean. It corroborates the data in *Table 3*, after which it is concluded that the vessels in the Indian Ocean are the largest and most powerful, a trend that seems to be maintained in recent years. To this effect, in 2018 the large-scale tuna purse seine vessels of Spanish interests for which catch data are available fished 12,247.12 tons in the Indian, this value being much higher than in the Atlantic and Pacific. *Table 7* also shows the low variability in average catches in the Atlantic, always

lower than in the rest of the waters, confirming even more the data in *Table 3*, while those of the Pacific have undergone significant fluctuations. This is due to the transfer of some vessels from one ocean to another, for different business reasons, such as the cost of fishing licenses, production costs, among others.

Finally, it should be noted that from a small town like Bermeo, 7.66% of the large-scale tuna purse seine vessels operating in the world are controlled, with which 6.27% of the world's tuna catches are managed, a percentage that increases to 10.40% if the focus is on tropical tunas.

Conclusions

Bermeo and the sea have been closely related since time immemorial. For centuries, the sea has been the axis around which the activity of the coastal population under study has revolved.

From the data available, apart from the whaling expeditions, of which there is not enough evidence to link them to Bermeo, coastal fishing remained essentially intact until the eighteenth century and was characterized by a cyclical production calendar.

Subsequently, after the liberalization of the fishing sector, a series of changes took place that exploded the sector at that time. Anyone who wanted to fish outside the protection of the fishermen's guilds had the door open to them. As a consequence of this, and together with the incorporation of steam as a means of propulsion, the first trawlers appeared, a clearly capitalist fishing model that was much more intensive than the traditional one. So much so that hake and sea bream fishing, the main coastal fisheries of several centuries before, disappeared.

Subsequently, significant technological improvements were incorporated and at the same time new actors, such as the canners, brought about a revolution in the fishing sector.

In response to the problems that the Spanish canneries were facing, and taking into account the North American industry, they increased their activity based on tropical tuna. The absence of these species in the waters of the Bay of Biscay, together with the growth of the fleet and the biological limits of the areas already exploited, led the fishermen of Bermeo to search for new fishing grounds. This is how the well-known "Dakar Campaigns" came about. There were nine campaigns with mixed results in western African waters.

For different reasons, the 1964-1965 campaign was the last one in which the traditional boats went down to those latitudes. From then on, the ultra-modern large-scale tuna purse seine vessels were introduced, which meant a radical change in business structures.

With exponential growth, they moved to new fishing grounds. Thus, by 1970 Spanish large-scale tuna purse seine vessels were operating in the Eastern Pacific Ocean, in 1984 in the Indian Ocean and by the mid-1990s in the rest of the Pacific Ocean. This was possible thanks to bilateral agreements with coastal countries and the creation of joint ventures.

All in all, almost two thirds of the large-scale tuna purse seine vessels of Spanish interest are controlled from Bermeo, which represents 7.66% of the total number of large-scale tuna purse seine vessels in the world. They catch 6.27% of all the tuna caught in the world, a percentage that increases to 10.40% if we focus on tropical tunas.

Therefore, it can be stated without hesitation that Bermeo is the tuna capital of the world.

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