UPF-BSM STUDIES COLLECTION Nº. 7

Catalan Fishing Sector

Social Value Study 2021-2022

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Content

Executive summary

Presentation:

The Catalan fishing sector, encompassing professional extractive fishing and is a cornerstone of regional economic and social well-being. Beyond its contribution to livelihoods and local economies, the sector also plays a pivotal role in preserving cultural heritage and advancing sustainable environmental practices. Given its multifaceted importance, evaluating and measuring the social value generated by the sector is crucial. Such an assessment not only highlights its role in supporting communities and bolstering economic resilience but also ensures alignment with broader sustainability goals, promoting long-term ecological and societal health.

Objective:

This study aims to analyze and quantify the social value generated by the Catalan fishing sector in 2021 and 2022, using the integrated social value (ISV) methodology developed by Dr. José Luis Retolaza and collaborators. The qualitative analysis explores the sector's impacts, the mechanisms driving these impacts, and the benefits delivered to stakeholders. The quantitative analysis complements this by developing indicators and proxies to monetize the value created for key stakeholder groups.

The objective is to provide a clear and measurable evaluation of the social value contributed by the sector, with a specific emphasis on understanding how these contributions evolve over time. By focusing on the sector's critical role in supporting fishing communities, promoting environmental sustainability, and bolstering regional economies, this analysis serves as a dynamic framework. It not only highlights the sector's present impact but also establishes robust metrics designed to systematically monitor and track changes in its contributions across successive periods, ensuring a comprehensive understanding of its long-term value and progress.

Understanding the social value of the Catalan fishing sector is essential for several reasons. It ensures accountability by demonstrating the effective use of public resources, supports improved resource management and alignment with strategic objectives, and enhances engagement with stakeholders, highlighting the sector's contributions to both local and global well-being.

Methodology:

Over the past decades, a wide range of methodologies has been developed to analyze and effectively manage the social impact of various companies across industries. Notable among these is the Social Return on Investment (SROI) methodology, which quantifies the social, environmental, and economic value created by an organization (Nicholls, 2009). Similarly, the Integrated Social Value (ISV) approach (Ayuso, Sánchez, & Retolaza, 2017; Lazcano & San-José, 2019) offers a holistic framework for assessing social impact by integrating multiple impact metrics (Maas & Liket, 2011). This method is particularly effective in capturing the complex interactions among economic, environmental, and social factors, fostering a deeper understanding of overall societal contributions. By promoting transparency and accountability, the ISV methodology has become a critical tool for sectors aiming to align their operations with sustainability goals.

This report applies the Integrated Social Value (ISV) methodology to the Catalan fishing sector for 2021 and 2022, offering a comprehensive assessment of its contributions. The ISV framework quantifies three main dimensions: (1) Direct Economic Impact of the sector, capturing the immediate financial benefits generated by fishing activities; (2) Indirect Economic Impact, reflecting the broader economic ripple effects through suppliers, service providers, and interconnected industries that support the sector; and (3) Social Impact, which is analyzed across four categories: the economic contribution to social value, the direct impact of fishing activities, the sector's role in local economic development, its environmental impact including marine resource conservation, and its contribution to public health by ensuring food security and access to nutritious and essential products of the so-called Mediterranean diet . This structured approach provides a holistic evaluation of the Catalan fishing sector's economic and social value.

Within the social categories, we have identified 11 key Value Variables encapsulating the sector's multifaceted contributions: Value Added of Fishing Activity, Contribution to the Local Economy, Expanding Markets for Catalan Fish Products, Cultural Heritage Preservation, Sustainable Management of Maritime Resources, Ecosystem and Biodiversity Restoration, Sustainable Fishing Practices, Environmental Impact of Local Fisheries, Carbon Footprint of Local Fisheries, Contribution to Food Security, and Contribution to Public Health. We consider that these variables represent a fundamental initial approach to evaluating the sector's role in fostering resilience, sustainability, and regional development. To quantify the economic value of these variables, we selected indicators and proxies exclusively based on existing data obtained from governmental reports or academic studies related to each topic. This limitation to pre-existing, reliable sources ensures the credibility and replicability of the analysis while setting a clear methodological boundary for the study.

This report serves as an initial exploration of a sector-wide study, setting it apart from previous analyses focused on specific organizations. It acknowledges certain limitations in its scope and methodology, as expected in a foundational effort. In this first iteration, we introduce a comprehensive set of variables, each accompanied by corresponding indicators and proxies, to lay the groundwork for a more refined and collaborative approach in future iterations. In subsequent studies, these variables will be refined in collaboration with stakeholders (see the list of stakeholders in section 4.1) and they will assess the relevance of each variable, contribute to their prioritization, and suggest additional variables of significance. By integrating their perspectives, following the outlined methodology, the framework will evolve to better capture the diverse impacts of the sector.

Results obtained:

The Catalan Fishing Sector generated an Integrated Social Value (ISV) of €636.9 million in 2021 and €654.6 million in 2022. This figure represents the combined value created through fishing

activities and the sector's broader economic impact, reflecting an increase of 2.78% in 2022 compared to the previous year:

The Specific Social Value (SSV), which gauges the sector's impact on its various stakeholder groups, amounted to €536,26 million in 2022, representing a 3,7% increase compared to €517,06 million in 2021. Key contributors to this value include increased exports, energy cost savings from non-refrigeration in local fisheries compared to long-distance operations, and the generation of indirect jobs in the manufacturing and processing of marine products.

The Social Economic Value (SEV) measures the economic impact of a sector's activities within a defined territory. It encompasses both direct impacts, arising from the sector's core operations, and indirect impacts, generated through interactions with suppliers and through consumption by the sector. In 2022, the SEV totaled €173 million, marking a modest decrease of 2% compared to €176.31 million in 2021. Within this, the direct impact declined slightly to €126.39 million from €128.41 million in the previous year. Similarly, the indirect impact — driven by supplier relationships and broader sectoral spending — decreased to €46.97 million from €48.53 million, highlighting a minor contraction in the sector's wider supply chain activity. This analysis underscores the sector's resilience amid challenging economic conditions, while also emphasizing the need for strategic initiatives to stimulate both core operations and ancillary activities.

The sector's contribution to public administration, through taxes and Social Security contributions, also recorded a slight decrease, from €74.68 million in 2021 to €73.75 million in 2022. Despite this decline, the sector continues to play a vital role in supporting public finances. The reduction is primarily attributed to the shrinking size of the fishing fleet. Notably, Catalonia's fishing fleet has undergone a significant contraction over the past decade, with the number of vessels dropping from 912 in 2013 to 673 in 2023.

This analysis illustrates the evolving economic and social impacts of the Catalan Fishing Sector, highlighting its critical contributions to regional sustainability, resilience, and development. Future studies will build upon this foundation, engaging stakeholders to refine variables and metrics further, ensuring a comprehensive understanding of the sector's dynamic value creation over time..

2021 Integrated Social Value Results for the Catalan Fishing Sector

	ECONOMIC RETURN TO PUBLIC ADMINISTRATIONS (R)	SOCIAL ECONOMIC VALUE (SEV)	SPECIFIC SOCIAL VALUE (SSV)	CONSOLIDATED SOCIAL VALUE
Direct impact of economic activities	28.335.115 €	128.415.027 €		128.415.027 €
Indirect impact of suppliers	46.348.637 €	48.532.604 €		48.532.604 €
Specific Social Value			517.062.108 €	517.062.108 €
Duplicate value in SEV and SSV				-57.077.349 €
Integrated Social Value (ISV)	74.683.752 €	176.947.631 €	517.062.108 €	636.932.389 €

2022 Integrated Social Value Results for the Catalan Fishing Sector

	ECONOMIC RETURN TO PUBLIC ADMINISTRATIONS (R)	SOCIAL ECONOMIC VALUE (SEV)	SPECIFIC SOCIAL VALUE (SSV)	CONSOLIDATED SOCIAL VALUE
Direct impact of economic activities	28.895.673 €	126.394.279 €		126.394.279 €
Indirect impact of suppliers	44.854.906 €	46.968.488 €		46.968.488 €
Specific Social Value			536.264.439 €	536.264.439 €
Duplicate value in SEV and SSV				-54.987.902 €
Integrated Social Value (ISV)	73.750.579 €	173.362.767 €	536.264.439 €	654.639.304 €

1. Introduction

The notion that only non-profit entities, such as foundations and NGOs, or social economy organizations, such as cooperatives and special employment centers, are responsible for generating social and environmental value is increasingly outdated. Today, the responsibility for driving positive societal and ecological change extends across all sectors, including the fishing industry. The Catalan fishing sector exemplifies this broader responsibility by contributing to economic, social, and environmental development. This shift aligns with the United Nations' Sustainable Development Goals (SDGs), which call upon all industries to work collectively towards a sustainable future that ensures societal well-being and environmental preservation.

This paradigm underscores the importance for industries like fishing to identify, measure, and communicate their social and environmental impact, thereby showcasing their critical role in fostering meaningful change. As defined by Oxford Impact Measurement (Harji & Nicholls, 2019), social impact involves substantial, evidence-based positive changes in the long-term conditions of people, ecosystems, and the planet, driven by organizational efforts. Over the past decade, methodologies such as Change Theory, Social Return on Investment (SROI), and Integrated Social Value (ISV) have emerged to measure and evaluate these contributions. Social value quantifies the relative importance of improvements in people's lives and environmental health that are not captured by financial metrics.

For the Catalan fishing sector, assessing social impact is particularly relevant for several reasons. First, it enhances accountability and transparency, ensuring the sector is held responsible for its actions. Second, it aligns the sector's resource management with sustainability goals and its strategic mission. Third, it fosters engagement and dialogue with stakeholders, demonstrating how the sector contributes to regional and global progress and well-being.

This study has the following objectives:

- Quantify the social value generated by the Catalan Fishing Sector and monetize it.
- Design a scoreboard to quantify the social impact of the Catalan Fishing Sector and monitor it annually.
- Establish a dialogue with all the agents of interest of the sector, to know which are the aspects that bring them more value.
- Be accountable to all the agents of interest of the sector and society in general.

The rest of the document is structured as follows. The next section details the methodology used to develop this study. The third section presents the Catalan Fishing Sector, providing some key data. The fourth section explains the stages followed to calculate social value. The fifth section presents and analyses the results of the social value obtained. Finally, we summarise the conclusions of the study.

2. Integrated social value methodology

In recent decades, various methodologies have been developed to quantify the social value generated by organizations, with a notable focus on sectors such as fisheries. While this report centers on the fishing sector as a whole, previous studies have often examined specific aspects of social value without adopting an integrated approach. For instance, the study "Economic, Social, and Environmental Impact of a Sustainable Fisheries Model in Spain" (Cámara & Santero-Sánchez, 2019), evaluates a sustainable fisheries model that promotes artisanal fishing, assessing economic impacts alongside social (employment) and environmental (CO_2 emissions reduction) factors. Similarly, the "Integrated Social-Economic-Ecological Modeling for Fisheries: The ECOST Model", (Failler & Touron-Gardic,2021), introduces a comprehensive assessment method for fishing activities and policies, aiming to enhance aquatic resource management and sustainable development in coastal zones. Additionally, the paper "Sustainability Assessment of the Societal Costs of Fishing Activities" (Béné & Doyen, 2022), examines the societal costs of fishing from a deliberative perspective, emphasizing the social dimensions of the industry. The report "Social and Economic Aspects of Mediterranean Small-Scale Fisheries" (Cavallé et al., 2020), provides innovative statistics to better understand the socioeconomic context of small-scale fisheries in the Mediterranean, supporting conservation and management efforts.

Collectively, these studies contribute valuable insights into the multifaceted social value of fishing activities, though often without a fully integrated valuation framework. We have utilized these studies to identify relevant value variables and to select appropriate indicators and proxies, thereby facilitating the development of a more holistic and integrated measurement approach for assessing the social value generated by the fishing sector.

The Integrated Social Value (ISV) methodology quantifies the economic and social value generated by an organization within a specific timeframe. Analogous to financial indicators like EBITDA or ROE, which assess a company's performance and viability, ISV provides a monetary valuation of the social value an entity produces annually in its operational domain. This approach has been applied to various Catalan public universities, including Pompeu Fabra University and Blanquerna, demonstrating its effectiveness in the higher education sector. We contend that ISV can be extended to other industries and employed to evaluate the social value contribution from a broader sectoral perspective.

The ISV methodology, developed by Retolaza et al. (2014), is a comprehensive social accounting system that integrates qualitative and quantitative analysis to assess the social impact generated by an organization. The qualitative aspect evaluates the impacts on key stakeholders, typically informed by interviews and consultations, while the quantitative aspect focuses on monetizing perceived benefits through indicators and proxies. These allow for the calculation of the value generated in monetary terms. This methodology offers a multidimensional perspective on social impact, enabling the identification, objectification, and visualization of the value created by different stakeholders. It extends beyond economic contributions to encompass impacts related to education, knowledge creation and dissemination, and business development, among others.

In this first application of the ISV methodology to the fishing sector, we have adhered to its foundational principles. However, it is important to note that stakeholder interviews or surveys, a key component of qualitative analysis, have not been conducted at this stage. Instead, the selection of variables has been based on insights from previous studies. In subsequent reports, we plan to engage directly with stakeholders to refine and prioritize these variables, ensuring a more robust and participatory approach in future iterations.

The process of analysing and calculating social value has been divided into the following four phases:

Phase 1: Identification of stakeholders (Tables 1 and 2)

Choose interest groups (not applicable)

Send questionnaire and grade by importance (not applicable)

Evaluation of questionnaire results (not applicable) Phase 2: identification of value variables

Choose stakeholders to send the questionnaire and prepare it (not applicable)

Receive answers on the questionnaire (not applicable).

Evaluate if more value variables should be included (not applicable) Phase 3: Evaluation and selection of indicators

Review and update of indicators and proxies – (Table 3)

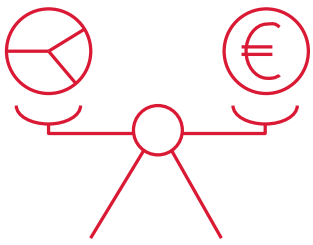
Collect quantitative data from IDESCAT, governmental reports, and academic studies. Step 4: Calculating social value.

Social impact from direct and indirect economic activity (Tables 4, 5, and 6)

Social impact from fishing activity (Tables 7 and 8 and Annex 3)

Integrated Social Impact (Table 9-a, 9-b)

4.4 Indicators of VSI for the Catalan Fishing Sector (Table 10)



3. The Catalan Fishing Sector

A Legacy of Resilience and Sustainability

The Catalan fishing sector, deeply rooted in the region's history, has evolved to balance economic needs with ecological preservation. As part of the Mediterranean's complex maritime ecosystem, Catalonia has historically relied on fishing as a cornerstone of its blue economy and cultural heritage. Over decades, this sector has faced challenges such as overfishing, habitat degradation, and the rising impacts of climate change. These pressures have driven innovation and adaptation, from the adoption of measures to reduce fishing (biological closures, closure of fishing grounds, etc.) to active participation in conservation and habitat restoration initiatives.

A recent study by the Institut Català de Recerca per a la Governança del Mar (Balcells-Surroca et al.,2024) analyses the fishing sector int Catalonia for the past decades. The study reveals that both port landings and revenues have shown a decreasing trend. In 2023, the total landings reached a historical low of 16,157 tons (t), compared to the peak of 37,044 t in 2006. Revenues have similarly declined, from a maximum of €130 million (M€) in 2007 to €86.18 M in 2023, despite temporary rebounds in 2021 and 2022 touching the €90 M. Interestingly, the average price per kilo has increased steadily from €3.42/kg in 2002 to €5.33/kg in 2023, reflecting a shift toward higher-value species. The fishing fleet has also been reduced significantly, from 1,087 vessels in 2002 to 702 in 2022 and further down to 535 in 2023. Finally, the report analyzes the impact of the EU Multiannual Plan (MAP) on demersal species, covering its effects on the Catalan fishing fleet, fishing markets, and specific species. The findings highlight the challenges and transitions faced by the Catalan fishing industry in adapting to environmental, economic, and regulatory changes.

Mission and Vision for the Future

Aligned with Catalonia's Maritime Strategy 2030, the sector aims to foster a sustainable blue economy that integrates environmental, social, and economic priorities. The mission is to ensure resilient marine ecosystems while supporting local communities and ensuring food security. Catalonia aspires to become a model of a sustainable maritime economy that balances human activity with ecological preservation.

Key strategic goals include:

- Sustainable Resource Management: Adopting modern, selective fishing practices to minimize bycatch and preserve biodiversity, and reduce the impact on the marine environment.
- Economic Resilience: Strengthening local economies through value-added processing and promoting Catalan seafood in domestic and international markets.
- Cultural Preservation: Safeguarding maritime traditions through initiatives like pesca- turisme, which combines tourism and fishing to educate visitors about Catalonia's rich maritime history.

Catalonia recognizes the profound impact of climate change on marine environments, with rising sea temperatures and changing salinity levels threatening marine biodiversity and fish stocks. Studies predict that by 2050, Mediterranean sea levels could rise by over 30 cm, with cascading effects on habitats and coastal communities. The fishing sector has embraced adaptive measures, including efforts to reduce carbon footprints, restore marine habitats, and enhance ecosystem resilience. At the same time, fishing activity has adapted to new species introduced as a consequence of climate change (blue crab, brown shrimp, etc.).

In response to these challenges, the sector has adopted strategies rooted in science and sustainability. Investments in more selective vessels, minimizing seabed impact, prioritizing energy efficiency, marine protected areas, and collaboration with scientific organizations such as ICATMAR highlight the industry's commitment to innovation and environmental sustainability. These efforts aim to maintain the health of marine ecosystems and ensure the viability of fishing as an economic and social activity.

A Path Forward

According to the Catalan Maritime Strategy 2030, developed by the Catalan government and approved by the Catalan Council for Maritime Co-management, the path forward for the Catalan fishing sector is clear and ambitious. This strategy outlines the following key priorities:

- Enhancing Marine Governance: Establishing participatory decision-making processes that actively involve local scientific communities, stakeholders, and environmental organizations in shaping the future of marine and coastal resource management.
- Strengthening Sustainability Practices: Promoting selective fishing methods and innovative gear technologies to minimize bycatch and reduce ecological impacts, alongside expanding habitat restoration projects like the regeneration of Posidonia meadows and other critical marine ecosystems.
- Boosting Local Seafood Products Consumption: Encouraging regional markets to prioritize Catalan seafood products, thereby reducing dependency on imports and strengthening the local economy while promoting sustainable food systems.
- Advancing Global Sustainable Maritime Practices: Positioning the Catalan fishing sector as a leader in sustainable maritime economy initiatives, fully aligned with the United Nations' Sustainable Development Goals (SDGs).

By following this roadmap, the Catalan fishing sector aims to balance its economic, environmental, social, and cultural dimensions, ensuring long-term resilience and sustainability in the face of global challenges like climate change and biodiversity loss, the lack of generational renewal, the decline in seafood consumption, and the loss of food sovereignty.

4. Phases of calculating social value

The process of calculating social value is divided into the following 4 phases:

4.1. Phase 1. Identification of stakeholders

In this section, we describe the methodology used to define the key stakeholders relevant to the Catalan fishing sector. Although advanced technology for stakeholder mapping will be applied in the 2023 report, this study relies on the stakeholders identified by the Departament d'Agricultura, Ramaderia, Pesca i Alimentació and the UPF Barcelona School of Management (UPF-BSM). The stakeholder map comprises a diverse array of individuals, organizations, and entities integral to the Catalan Fishing Sector. These include fishermen, cooperatives, regulatory bodies, environmental organizations, and local communities, among others. Their roles and interactions form the basis for understanding the sector's contributions and challenges.

For this report, the stakeholder identification process was based on consultations and previous studies conducted by the Catalan Department of Fisheries. The pre-defined groups align with the strategic priorities of the sector and represent a comprehensive cross-section of those impacted by or contributing to the sector's operations. Unlike the survey-driven approach planned for 2023, this study has opted for an expert-defined stakeholder model to ensure alignment with policy and governance frameworks (see Table 1).

Table 1. The Catalan Fishing Sector stakeholders

CODE	STAKEHOLDER	DESCRIPTION
F	Fishermen and Workers in the Fishing Sector	Individuals directly employed in fishing and related maritime industries.
LC	Local Communities	Coastal populations and regions that depend on the fishing sector for economic activity, cultural identity, employment and Fishing Local Action Groups (FLAGs).
C	Consumers	End-users of seafood products, particularly those prioritizing locally sourced and sustainably harvested fish.
EO	Environmental Organizations	Groups focused on marine conservation, biodiversity preservation, and sustainable resource management.
GR	Governmental and Regulatory Bodies	Institutions responsible for creating, implementing, and monitoring policies, including fishing sustainability regulations and maritime and food laws.
R	Seafood Retailers and Wholesalers	Businesses involved in the trade, marketing, and distribution of fish and seafood products.
X	Exporters and International Market Stakeholders	Entities engaged in expanding Catalan fish products to regional and international markets.
T	Tourism Sector and Event Organizers	Organizations leveraging cultural events and maritime traditions to boost local tourism and community engagement.
H	Health and Nutrition Advocates	Stakeholders emphasizing the public health benefits of seafood consumption, particularly omega-3-rich fish.

4.2. Phase 2. Identification of value variables

The methodology for selecting value variables involves stakeholder participation to identify activities that generate the highest value across selected interest groups. This process captures diverse perspectives and ensures the relevance of the variables. The methodology typically includes the following steps: (1) Stakeholder Identification and Engagement, (2) Data Collection Techniques, such as surveys or focus groups, (3): Prioritization of Variables by stakeholders, and

(4) Analysis and Consolidation to remove redundancies and ensure completeness.

For this study, we have opted for an alternative approach. The Departament d'Agricultura, Ramaderia, Pesca i Alimentació and the UPF-BSM have identified the value variables, drawing on prior studies and empirical evidence. Stakeholder participation will be incorporated in subsequent reports to further refine and validate these variables. This adjustment is warranted to establish a foundational baseline for analysis while ensuring the report's timely delivery.

The current selection of variables is informed by evidence-based criteria, aligning with established frameworks in socio-economic and environmental impact assessments. Research supports the categorization into the following areas, encompassing four categories and 11 variables. The selection of the four categories—Impact of Fishing Activities, Impact on Local Economic Development, Environmental impact and conservation of marine resources, and Impact on Public Health—to evaluate the social impact of the fishing sector is grounded in both their relevance to the sector and alignment with established frameworks for socio-economic and environmental analysis. These categories capture the comprehensive contributions and challenges of the fishing sector. Cámara and Santero-Sánchez (2019) explore the multifaceted impacts of a sustainable

fisheries model in Spain, aligning with the four categories in question: it highlights the role of artisanal fishing in sustainable management, evaluates fisheries' economic contributions to local communities through income generation and employment, assesses the ecological effects of fishing with a focus on fish stock preservation and environmental conservation, and acknowledges the role of fisheries in providing nutritious food, indirectly supporting public health. By addressing these dimensions, the study offers a holistic framework for evaluating the social impact of the fishing sector.

The paper "Economic, Social, and Environmental Impact of a Sustainable Fisheries Model in Spain" by Cámara and Santero-Sánchez (2019) supports the selection of variables under the categories of Economic Development and Sustainability. It highlights how fisheries contribute to local economies through employment and income generation, emphasizing market diversification and the preservation of cultural heritage via

traditional fishing practices. Additionally, it underscores the importance of sustainable resource management, ecosystem restoration, and minimizing environmental impacts, aligning with the need for balanced ecological and economic practices. These insights provide a robust framework for evaluating the socio-economic and environmental dimensions of fisheries.

In subsequent reports, the full participatory methodology will be applied. This will involve engaging stakeholders, evaluating the selected variables, and refining priorities based on direct feedback. By transitioning to the standard approach, the analysis will benefit from a more comprehensive and representative understanding of stakeholder perspectives, enhancing the robustness of the findings.

Table 2. Value variables and stakeholders affected

CATEGORÍES	VALUE VARIABLES	STAKEHOLDER
1. Impact of Fishing Activities	1.1: Value Added of Fishing activity	F, LC, C, R, T
2. Impact on local economic development	2.1: Contribution of the fishing sector to the local economy	F, LC, C, R, T
	2.2: Expansion of markets for Catalan fish products.	F, LC, X, C, R
	2.3: Preservation of the fishing cultural heritage	F, LC, T
3.Environmental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	F, LC, C, EO, GR
	3.2: Restoration and protection of ecosystems and biodiversity	F, LC, C, EO, GR
	3.3: Sustainable Fishing Activity	F, LC, C, EO
	3.4 : Environmental impact of local fisheries	F, EO, GR
	3.5: CO2 impact of local fisheries	LC, EO, GR
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	C, GR, H
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	C, GR, H

4.3. Phase 3. Selection of indicators and proxies

Choosing the right indicators and proxies (variables closely related to the study's main variables) is crucial for quantifying the social value of the Catalan fishing sector. These indicators enable the measurement of the sector's performance across the variables outlined in the preceding analysis. Proxies facilitate the conversion of various indicator units into monetary values, enhancing the analysis's accuracy and comprehensiveness. This selection phase was supported by data collection from public institutions, academic papers, studies and statistical sources, ensuring the chosen indicators accurately reflect each value variable. Additionally, the selection process was informed by indicators previously used in similar studies, guaranteeing both relevance and comparability. The following table (Table 3) highlights the selected indicators and proxies used to assess the social and economic value of the Catalan fishing sector.

Table 3. Indicators and proxies used for the quantification of social value

CATEGORIES	VALUE VARIABLES	INDICATOR	PROXY	SOURCES
1. Impact of Fishing Activities	1.1: Value Added of Fishing activity	Indicator: Value added (EUR) Value added refers to the difference between the value of the total output of a sector and the value of the inputs used in the production process.	No proxy	Subsecretaría de Pesca Marítima, Subdirección General de Análisis, Coordinación y Estadística. (2022). Principales resultados: Encuesta económica de pesca marítima 2022. Ministerio de Agricultura, Pesca y Alimentación. https://cpage.mpr.gob.es/ https://www.mapa.gob.es/es/estadistica/temas/estadisticas- pesqueras/2022_principales-resultados_encuesta-economica-pm_tcm30- 667818.pdf Subsecretaría de Pesca Marítima, Subdirección General de Análisis, Coordinación y Estadística. (2021). Principales resultados: Encuesta económica de pesca marítima 2022. Ministerio de Agricultura, Pesca y Alimentación. https://cpage.mpr.gob.es/ https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/2021_principales-resultados_encuesta-economica-pm_tcm30- 639667.pdf
2. Impact on local economic development	2.1: Contribution of the fishing sector to the local economy.	Indicator: Local consumption of fresh fish (Kg) in the territory of Catalonia (32% of the total catch)	Proxy: Difference in the price of fresh fish and alternatives (10€/kg).	Fusté Forné, F., Medina, F. X., & Mundet i Cerdan, L. (2020). La proximidad de los productos alimentarios: turismo gastronómico y mercados de abastos en la costa daurada (Cataluña, España). Revista de Geografía Norte Grande, (76), 213-231. Claret, A., Guerrero, L., Aguirre, E., Rincón, L., Hernández, M. D., Martínez, I., ... & Rodríguez-Rodríguez, C. (2012). Consumer preferences for sea fish using conjoint analysis: Exploratory study of the importance of country of origin, obtaining method, storage conditions and purchasing price. Food Quality and Preference, 26(2), 259-266.
		Indicator: Value added in the wholesale and retail trade of fish, shellfish, and other food products (EUR)	Proxy: percentage of product from local fishing	Subsecretaría de Pesca Marítima, Subdirección General de Análisis, Coordinación y Estadística. (2022). Principales resultados: Encuesta económica de pesca marítima 2022. Ministerio de Agricultura, Pesca y Alimentación. https://cpage.mpr.gob.es/ https://www.mapa.gob.es/es/estadistica/temas/estadisticas- pesqueras/2022_principales-resultados_encuesta-economica-pm_tcm30- 667818.pdf Subsecretaría de Pesca Marítima, Subdirección General de Análisis, Coordinación y Estadística. (2021). Principales resultados: Encuesta económica de pesca marítima 2022. Ministerio de Agricultura, Pesca y Alimentación. https://cpage.mpr.gob.es/ https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/2021_principales-resultados_encuesta-economica-pm_tcm30- 639667.pdf
		Indicator: Generation of indirect jobs derived from the fishing sector manufacture and processing of marine products in Catalonia	Proxy: Average Salary in Marine Products Manufacturing and Processing Sector	Institut d'Estadística de Catalunya (IDESCAT). (2021-2022). Flota pesquera i captures. Per modalitat https://www.idescat.cat/indicadors/?id=aec&n=15446&fil=9
	2.2: Expansion of markets for Catalan fish products.	Indicator: Volume of exports of fish and molluscs sold in regional and international markets. (EUR)	Proxy: Percentage of the Gross Value Added of exports (between 20% and 40%).	Prodeca. (2022). Exportacions agroalimentàries catalanes 2022. Generalitat de Catalunya. https://www.prodeca.cat/sites/default/files/2023- 02/INFORME_Exportacions-agroalimentaries-2022_1.pdf Prodeca. (2021). Exportacions agroalimentàries catalanes 2021. Generalitat de Catalunya https://www.prodeca.cat/sites/default/files/files/INFORME_exportacions_A GRO_2021.pdf
	2.3: Preservation of the fishing cultural heritage	Indicator: Number of cultural events (festivals, fairs) related to fishing and community participation.	Proxy: Cost of organizing cultural events and their economic impact on local tourism.	Blog Cultura Digital. Subvencions per a l'organització d'esdeveniments de contingut cultural digital a Catalunya (CLT099) · 2024 · https://culturadigital.blog.gencat.cat/subvencions-organitzacio- esdeveniments-contingut-cultural-digital-catalunya-clt099-2024/?
		Indicator: Number of specific training hours for fishermen.	Proxy: Cost per hour of training and increase in productivity or average income of trained workers.	Escola de Capacitació Nauricopesquera de Catalunya https://agora.xtec.cat/iesnautica/

CATEGORIES	VALUE VARIABLES	INDICATOR	PROXY	SOURCES
3.Environmental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	Indicator: Percentage of capture that complies with sustainability regulations and allows value creation fo the maritim ecosistem (67%, minus trawling, which is 33%)	Proxy: Economic value of the maritime ecosystem improvement (Total value for Catalonia is USD 3,195 million, of which 40% comes from the coastal zone. It is estimated that 6.5% of this value derives from the ecosystem services provided by Posidonia oceanica meadows, which are linked to fishing activities)	Brenner, J., Jimenez, J. A., Sarda, R., & Garola, A. (2010). An assessment of the non-market value of the ecosystem services provided by the Catalan coastal zone, Spain. Ocean & Coastal Management, 53(1), 27-38. https://www.sciencedirect.com/science/article/pii/S0964569109001422
	3.2: Restoration and protection of ecosystems and biodiversity	Indicator: percentage of the Catalan coast affected by the preservation plan worldwide (13% of the global coast is Spain and 6% is Catalonia)	Proxy: Cost to the fishing sector of the preservation and reconstruction of marine life until 2050. Estimated as 15% of the minimum cost (9,000 million USD per year globally)	Duarte, C. M., Agusti, S., Barbier, E., Britten, G. L., Castilla, J. C., Gattuso, J. P., ... & Worm, B. (2020). Rebuilding marine life. Nature, 580(7801), 39- 51. https://www.nature.com/articles/s41586-020-2146-7
		Indicator. Number of protected hectares.	Proxy: Value of the ecosystem service of protected areas (EUR/Ha/Year)	Departament d'Agricultura, Ramaderia, Pesca i Alimentació. (n.d.). Responsable d'Aqüicultura i Oceanografia. Direcció general de Política Marítima i Pesca Sostenible. Generalitat de Catalunya. Gomez, A.M. & Esruch, A. V. (2019) Valoración económica de los servicios ecosistémicos marinosun caso de estudio de La Safor, Golfo de Valencia, España. Ecosistemas: Revista científica y técnica de ecología y medio ambiente, ISSN-e 1697-2473, Vol. 28, Nº. 2, 2019 (Ejemplar dedicado a: Restauración de interacciones), págs. 100-108 https://dialnet.unirioja.es/servlet/articulo?codigo=7134925
	3.3: Sustainable Fishing Activity	Indicator: Reduction in fishing effort, reduction in the number of vessels	"Proxy: Direct cost to the fishing community. Turnover per vessel (€98 million for 702 vessels = €139.601 per vessel)"	Institut d'Estadística de Catalunya (IDESCAT). (2021-2022). Flota pesquera i captures. Per modalitat https://www.idescat.cat/indicadors/?id=aec&n=15446&fil=9
		Indicator: Kg of trawl catch adopted by selective fishing gear (Kg of total catch based on the percentage of vessels that have adopted it, 24%)	"Proxy: Difference in the price of certified and non- certified sustainable fish (€/kg)	Generalitat de Catalunya. (n.d.). El futur de la pesca i l'aqüicultura a Catalunya: Cap a un model sostenible d'adaptació al canvi climàtic. RuralCat. Recuperado de https://ruralcat.gencat.cat/article-tecnic/-/journal_content/2002/20181/10873038/el-futur-de-la-pesca-i-l-aquicultura- a-catalunya-cap-a-un-model-sostenible-d-adaptacio-al-canvi-climatic
	3.4 : Environmental impact of local fisheries	Indicator: Trawlers equipped with eco- efficient fishing technology (19%)	Proxy: Investment in sustainable boat technology	Departament d'Agricultura, Ramaderia, Pesca i Alimentació. (n.d.). Responsable d'Aqüicultura i Oceanografia. Direcció general de Política Marítima i Pesca Sostenible. Generalitat de Catalunya. Generalitat de Catalunya. (2022). Informe sobre les possibilitats actuals per a la descarbonització de la flota pesquera i auxiliar catalana. Departament d'Acció Climàtica, Alimentació i Agenda Rural. https://agricultura.gencat.cat/web/.content/08-pesca/flota- pesquera/enllacos-documents/fitxers- binaris/InformePossibilitatsDescarbonitzacio_V5.5_signed.pdf
		Indicator: Number of environmental awareness campaigns.	Proxy: Cost per campaign and social value of raising awareness of marine sustainability.	https://ruralcat.gencat.cat/article-tecnic/-/journal_content/2002/20181/10873038/el-futur-de-la-pesca-i-l-aquicultura- a-catalunya-cap-a-un-model-sostenible-d-adaptacio-al-canvi- climatic?utm_source=chatgpt.com Smartbound. (n.d.). ¿Cuál es el coste de una campaña de marketing digital?. Recuperado de https://smartbound.io/blog/cual-es-el-coste-de- una-campana-de-marketing-digital
	3.5: CO2 impact of local fisheries	Indicator: Local consumption of fresh fish in the territory of Catalonia (32% of the total catch) (Kg)	Proxy: Savings in CO_2 emissions compared to transporting imported fish. (4.42kg CO2 /kg x 0.026€/kg CO2 = 0.11)	Aragao, G. M., Saralegui-Díez, P., Villasante, S., López-López, L., Aguilera, E., & Moranta, J. (2022). The carbon footprint of the hake supply chain in Spain: Accounting for fisheries, international transportation and domestic distribution. Journal of Cleaner Production, 360, 131979. https://www.sciencedirect.com/science/article/pii/S0959652622015888 Decarre, S., Berthiaud, J., Butin, N., & Guillaume-Combecave, J. L. (2010). CO2 maritime transportation. International Journal of Greenhouse Gas Control, 4(5), 857-864. https://www.sciencedirect.com/science/article/pii/S1750583610000794

CATEGORIES	VALUE VARIABLES	INDICATOR	PROXY	SOURCES
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	Indicator: Local consumption of fresh fish in Catalonia (32% of total catches) (Tn)	Proxy: energy cost to maintain the safety of cold or frozen food (750 kWh/Tn x €28.3/kWh = €21.225/Tn).	Nordtvedt, T. S., & Widell, K. N. (2020, August). Refrigeration and sustainability in the seafood cold chain. In 6th IIR International Conference on Sustainability and the Cold Chain. Proceedings: Nantes, France (Vol. 12). https://www.sintef.no/globalassets/sintef-ocean/coolfish/publications/2020_cp_nordtvedt.pdf Eurostat. (2024, octubre 28). Electricity prices for households and non- households in Europe. Retrieved from https://ec.europa.eu/eurostat/en/web/products-eurostat-news/w/ddn- 20241028-1
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	Indicator: Population consuming fresh fish and seafood derived from local fishing (catches * 32% / per capita consumption) (individuals).	Proxy: Savings in medical cost per person by consuming Omega-3 (According to studies, omega-3 can reduce cardiovascular events by 10% and the cost is €500 per person per year, €50/person/year).	AECOC. (n.d.). El consumidor catalán de pescado y marisco. Recuperado de https://www.aecoc.es/articulos/el-consumidor-catalan-de-pescado-y- marisco/ Gao L, Moodie M, Li SC. The cost-effectiveness of omega-3 polyunsaturated fatty acids - The Australian healthcare perspective. Eur J Intern Med. 2019 Sep;67:70-76. doi: 10.1016/j.ejim.2019.07.001. Epub 2019 Jul 6. PMID: 31285124. https://pubmed.ncbi.nlm.nih.gov/31285124/ Ministerio de Agricultura, Pesca y Alimentación. (2022). Informe del consumo alimentario en España 2022. Recuperado de https://www.mapa.gob.es/ca/alimentacion/temas/consumo- tendencias/informe-consumo-2022-baja-res_tcm34-655390.pdf Ministerio de Agricultura, Pesca y Alimentación. (2021). Informe del consumo alimentario en España 2021. Recuperado de https://www.mapa.gob.es/es/alimentacion/temas/consumo- tendencias/informe-consumo-alimentario-2021-baja-res_tcm30-624017.pdf https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/informe-anual-consumo-2020-v2-nov2021-baja-res_tcm30- 562704.pdf
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	Indicator: Local consumption of fresh fish in Catalonia (32% of total catches) (Tn)	Proxy: energy cost to maintain the safety of cold or frozen food (750 kWh/Tn x €28.3/kWh = €21.225/Tn).	Nordtvedt, T. S., & Widell, K. N. (2020, August). Refrigeration and sustainability in the seafood cold chain. In 6th IIR International Conference on Sustainability and the Cold Chain. Proceedings: Nantes, France (Vol. 12). https://www.sintef.no/globalassets/sintef-ocean/coolfish/publications/2020_cp_nordtvedt.pdf Eurostat. (2024, octubre 28). Electricity prices for households and non- households in Europe. Retrieved from https://ec.europa.eu/eurostat/en/web/products-eurostat-news/w/ddn- 20241028-1
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	Indicator: Population consuming fresh fish and seafood derived from local fishing (catches * 32% / per capita consumption) (individuals).	Proxy: Savings in medical cost per person by consuming Omega-3 (According to studies, omega-3 can reduce cardiovascular events by 10% and the cost is €500 per person per year, €50/person/year).	AECOC. (n.d.). El consumidor catalán de pescado y marisco. Recuperado de https://www.aecoc.es/articulos/el-consumidor-catalan-de-pescado-y- marisco/ Gao L, Moodie M, Li SC. The cost-effectiveness of omega-3 polyunsaturated fatty acids - The Australian healthcare perspective. Eur J Intern Med. 2019 Sep;67:70-76. doi: 10.1016/j.ejim.2019.07.001. Epub 2019 Jul 6. PMID: 31285124. https://pubmed.ncbi.nlm.nih.gov/31285124/ Ministerio de Agricultura, Pesca y Alimentación. (2022). Informe del consumo alimentario en España 2022. Recuperado de https://www.mapa.gob.es/ca/alimentacion/temas/consumo- tendencias/informe-consumo-2022-baja-res_tcm34-655390.pdf Ministerio de Agricultura, Pesca y Alimentación. (2021). Informe del consumo alimentario en España 2021. Recuperado de https://www.mapa.gob.es/es/alimentacion/temas/consumo- tendencias/informe-consumo-alimentario-2021-baja-res_tcm30-624017.pdf https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/informe-anual-consumo-2020-v2-nov2021-baja-res_tcm30- 562704.pdf
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	Indicator: Local consumption of fresh fish in Catalonia (32% of total catches) (Tn)	Proxy: energy cost to maintain the safety of cold or frozen food (750 kWh/Tn x €28.3/kWh = €21.225/Tn).	Nordtvedt, T. S., & Widell, K. N. (2020, August). Refrigeration and sustainability in the seafood cold chain. In 6th IIR International Conference on Sustainability and the Cold Chain. Proceedings: Nantes, France (Vol. 12). https://www.sintef.no/globalassets/sintef-ocean/coolfish/publications/2020_cp_nordtvedt.pdf Eurostat. (2024, octubre 28). Electricity prices for households and non- households in Europe. Retrieved from https://ec.europa.eu/eurostat/en/web/products-eurostat-news/w/ddn- 20241028-1
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	Indicator: Population consuming fresh fish and seafood derived from local fishing (catches * 32% / per capita consumption) (individuals).	Proxy: Savings in medical cost per person by consuming Omega-3 (According to studies, omega-3 can reduce cardiovascular events by 10% and the cost is €500 per person per year, €50/person/year).	AECOC. (n.d.). El consumidor catalán de pescado y marisco. Recuperado de https://www.aecoc.es/articulos/el-consumidor-catalan-de-pescado-y- marisco/ Gao L, Moodie M, Li SC. The cost-effectiveness of omega-3 polyunsaturated fatty acids - The Australian healthcare perspective. Eur J Intern Med. 2019 Sep;67:70-76. doi: 10.1016/j.ejim.2019.07.001. Epub 2019 Jul 6. PMID: 31285124. https://pubmed.ncbi.nlm.nih.gov/31285124/ Ministerio de Agricultura, Pesca y Alimentación. (2022). Informe del consumo alimentario en España 2022. Recuperado de https://www.mapa.gob.es/ca/alimentacion/temas/consumo- tendencias/informe-consumo-2022-baja-res_tcm34-655390.pdf Ministerio de Agricultura, Pesca y Alimentación. (2021). Informe del consumo alimentario en España 2021. Recuperado de https://www.mapa.gob.es/es/alimentacion/temas/consumo- tendencias/informe-consumo-alimentario-2021-baja-res_tcm30-624017.pdf https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/informe-anual-consumo-2020-v2-nov2021-baja-res_tcm30- 562704.pdf

4.4. Phase 4. Calculation of the social value generated

The final step in the process of assessing social value involves monetizing the social value produced by the Catalan fishing sector, using the data from the indicators and proxies detailed in the previous table. In certain cases, direct economic data obtained from the indicators rendered the use of proxies unnecessary for monetizing social value. According to Ayuso et al. (2017), the social value generated by an organization can be categorized into various types, including the value created through economic activities, socio-economic benefits for public administrations, and specific value contributions to distinct stakeholder groups. This monetization process enables the quantification of the value that the fishing sector contributes to each of these groups.

The subsequent section will outline the results of this calculation, showcasing the social value generated by the Catalan fishing sector in each Category (See Annex 2).

4.4.1. Economic Valuation of the Social Value of Fishing Activity

Fishing Activity

The economic valuation of the social value generated by the fishing sector in Catalonia begins with the value added it creates. In 2022, the fishing sector contributed 50,315,923 EUR, slightly decreasing from 52,151,778 EUR in 2021. This value-added metric reflects not only the sector's efficiency but also its role in sustaining economic productivity, employment, and regional livelihoods. By quantifying this output, the analysis underscores how fishing activity directly supports the economy while creating a foundation for broader social value, such as employment stability and food security.

4.4.2. Impact on Local Economic Development and Social Contribution

Contribution of the Fishing Sector to the Local Economy

The fishing sector plays a crucial role in supplying locally sourced food, contributing to both economic activity and community well-being. In 2022, 32% of the total catch—equivalent to 6,761,582 kilograms—was consumed locally in Catalonia. This supports local food systems and provides affordable access to fresh fish, reinforcing food sovereignty and dietary benefits for the population. Furthermore, the value added by wholesale and retail trade of fish and shellfish grew to 684,747 EUR in 2022, compared to 500,727 EUR in 2021. This reflects how fishing extends its economic and social impact by supporting businesses, food retailers, and market accessibility. Additionally, the sector indirectly generated 5,086 jobs in marine product processing, and related activities, up from 4,662 jobs in 2021. These indirect jobs provide economic opportunities, social stability, and improve livelihoods across associated industries.

Expansion of Markets for Catalan Fish Products

The ability of Catalan fishing to export products reflects its economic and social value by supporting trade and regional prosperity. In 2022, the export volume of fish and mollusks reached 368,900,000 EUR, an increase from 324,950,000 EUR in 2021. This expansion enhances the visibility of Catalan seafood in international markets, fostering local pride and boosting economic returns that indirectly support community development and job creation.

Preservation of Fishing Cultural Heritage

Cultural and educational contributions further reinforce the social value of fishing activity. In 2022, 23 cultural events such as festivals and fairs celebrated the fishing heritage, up from 19 events in the previous year. These events enhance community identity, attract tourism, and promote regional traditions. Additionally, 10,000 hours of specific training for fishermen were conducted, ensuring the transfer of knowledge, preservation of skills, and sustainable practices. This training not only supports fishermen's livelihoods but also safeguards the future of the sector as a vital cultural and economic pillar of Catalonia.

4.4.3. Environmental Impact and Conservation of Marine Resources

Co-Management: Sustainable Management of Fisheries Resources

Co-managed fisheries improve the sustainable management of resources by fostering collaboration among fishers, scientists, authorities, and other stakeholders in decision-making. This model allows fishing efforts to be adjusted based on resource status, the implementation of flexible measures such as temporary closures or adaptive quotas, and the promotion of more selective techniques that minimize environmental impact. Additionally, it enhances regulatory compliance, reduces illegal fishing, and ensures the long-term economic viability of the sector. Overall, co-management strengthens the resilience of marine ecosystems and fishing communities, ensuring a balanced and responsible use of marine resources.

In 2022, 28% of the total Catalan fishing fleet (which represented 55% of the total fleet in the small-scale fishing modality) was exploited under a co-management regime, and this percentage has been steadily increasing each year. By 2023, 33% of the total fleet and 64% of the small-scale fishing fleet were operating under this regime.

Restoration and Protection of Ecosystems and Biodiversity

Environmental preservation contributes significant social and economic value to Catalonia. Approximately 0.8% of the Catalan coast is protected under global preservation initiatives, and 1,119 hectares of marine areas are designated for protection. Additionally, 500 km_2 of fishing grounds have been permanently closed, along with 1-2 months of temporary biological closures to strengthen the sustainability of marine resources. In this context, the ECOREST project promotes the restoration of deep-sea habitats through collaboration with the fishing sector, the recovery of accidentally caught species, and the reintroduction of organisms into their natural environment, thus fostering the regeneration of marine ecosystems. These conservation efforts enhance biodiversity, ecosystem services, and resilience against environmental degradation, benefiting both the fishing sector and the broader community.

Sustainable Fishing Activity

Reducing the fishing effort creates long-term value for both ecosystems and local communities. In 2022, the sector saw a reduction of 14 fishing vessels, reflecting an effort to balance economic activity with resource conservation. Additionally, 1703,202 kilograms of trawl catches were obtained using selective fishing gear, showing progress from 1,584,940 kilograms

in 2021. By adopting sustainable fishing techniques, the sector ensures resource longevity and enhances the sector's positive image. However, in the last 20 years, fishing has decreased by 50%, and if this trend continues, it could jeopardize the ecological and economic balance of the sector, impacting the viability of fishing activities and the availability of marine resources.

Environmental Impact of Local Fishing

Trawl vessels equipped with fly doors to reduce seabed impact, minimize fuel consumption, and improve trawling efficiency make up 19% of the fleet and are likely to increase in the coming years. These advancements demonstrate a commitment to reducing the environmental footprint of fishing activities. Additionally, 23 environmental awareness campaigns were carried out, engaging the public and promoting sustainable practices that enhance the social value of the sector. Another essential role of the fleet is collecting plastics from the sea, a key initiative of the Pescaneta program, which involves fishers in the fight against marine pollution. In just 2021 and 2022, along the coasts of Girona, Tarragona, and Barcelona, the fishing fleet collected 69,941 liters and 72,721 liters of plastic, respectively, demonstrating their commitment to protecting the marine environment.

CO2 Impact of Local Fishing

The consumption of locally sourced fresh fish—32% of the total catch amounting to 6,761,582 kilograms—directly reduces CO2 emissions by minimizing the need for long- distance transportation. This local consumption aligns economic activity with environmental responsibility, contributing to climate change mitigation and delivering a sustainable food source for the Catalan population.

4.4.4. Public Health Benefits and Social Value

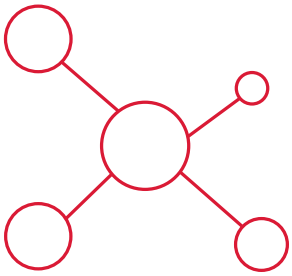
Contribution of Local Fishing to Energy Saving and Safety in Public Health

The local availability of fresh fish not only reduces energy demands associated with refrigeration and freezing but also enhances public health security. In 2022, 6,762 tonnes of fresh fish were consumed locally in Catalonia, reducing energy consumption linked to cold-chain logistics while providing a safer and more sustainable food supply.

Contribution of Fishing to Public Health (Consumption of Fish and Omega-3)

The social value of the fishing sector is further evidenced by its contribution to public health through the provision of fresh fish, a key component of a healthy diet. In 2022, approximately 38.7% of the Catalan population consumed fresh fish, a slight increase from 38.6% in 2021. With a per capita intake of 11.34 kg per person, and considering that 32% of local fish catches are designated for local consumption, the sector has facilitated an increase in the number of individuals benefiting from fresh fish, rising from approximately 547,432 to 596,259 individuals. Fresh fish provides omega-3 fatty acids, which play a significant role in preventing cardiovascular diseases and improving overall health. By supporting better dietary habits, fishing activity directly contributes to public health outcomes, reducing medical costs and enhancing quality of life.

In summary, the economic valuation of the social value provided by fishing activity in Catalonia highlights its multifaceted contributions. Beyond direct economic metrics like value added and job creation, fishing supports food security, cultural heritage, environmental sustainability, and public health. By fostering economic growth, preserving traditions, and advancing environmental responsibility, the fishing sector remains a cornerstone of Catalonia's economy and society, delivering enduring value for present and future generations.



5. The social value generated

In this section, we delve into the social value generated by the Catalan fishing sector, categorized into three distinct types: the value generated from economic activities, the value generated from environmental and social contributions, and the integrated or consolidated social value. This breakdown provides a comprehensive view of the sector's multifaceted contributions to society, encompassing its economic impact, its role in preserving the environment and cultural heritage, and its overall influence on public well-being. By considering these dimensions, we achieve a holistic understanding of the total social value delivered by the Catalan fishing sector to the economy and communities of Catalonia.

5.1. The social value generated from economic activities

The social value derived from economic activities represents the influence of the Sector's economic operations within a territory. This encompasses both the direct impact, which includes the value added, salaries, taxes, and other contributions stemming directly from the organization's activities, as well as the indirect impact, which arises from interactions with suppliers. This comprehensive assessment highlights the Sector's significant role in stimulating economic growth and development through its operational footprint.

Table 4 presents the most significant data on the Sector's economic activity. provided by the administration department. and based on accounting information.

Table 4. Social impact of Catalan Fishing Sector's direct economic activity

		TOTAL CATALAN FISHING SECTOR		19 FISHERMAN'S GUILDS			
DESCRIP.	INDICATOR	2022 (M EUR)	2021 (M EUR)	2022 (M EUR)	2021 (M EUR)	2022 (%)	2021 (%)
Salaries	Net Salaries	29.678,92	29.176,96	4.840,01	4.611,19	16%	16%
Social Security	Social Security total	13.088,40	12.867,04	1.224,65	1.401,56	9%	11%
Income Tax	Income Tax	5.983,27	5.882,08	99,60	87,96	2%	1%
Corporate Tax	Corporate Tax	8.248,19	8.561,60	45,06	73,50	1%	1%
Result	Net value added at basic price	54.987,90	57.077,35	319,40	215,43	1%	0%
Depreciation	Fixed Capital Consumption	4.583,60	5.264,00	1.036,52	1.044,89	23%	20%
VAT	Value Added Tax	9.824,00	9.586,00	200,17	169,63	2%	2%
Total		**126.394,28**	**128.415,03**	**7.765,42**	**7.604,15**	**6%**	**6%**

Source: Data from IDESCAT and estimates of the taxes derived. Fisherman's Guilds data extracted from the financial statements of the 19 Guilds in Catalonia

In the sphere of commercial operations, the direct socioeconomic value of the Catalan fishing sector reflects its net economic contributions, primarily through value added and related fiscal inputs. In 2022, the sector generated a direct socioeconomic impact of €126.4 million, compared to €128.4 million in 2021. This figure includes wages, taxes, social security payments, and other direct outputs stemming from fishing-related activities.

In addition to its economic output, the sector plays a vital role in supporting public finances. In 2022, it contributed approximately €13 million to Social Security, and a combined €14 million through income tax and corporate tax. Furthermore, it generated €9.8 million in VAT contributions, underscoring its importance as a key provider of fiscal resources to public administrations.

The 19 Catalan fishermen's guilds (Annex 4 provides detailed information on the individual guilds) generated a total direct socioeconomic value of €7.77 million in 2022, compared to €7.60 million in 2021, representing 6% of the total Catalan fishing sector. Within this figure, salaries (net wages) amounted to €4.84 million, which accounts for 16% of the total sector wage value. Depreciation, measured as fixed capital consumption, was €1.04 million, representing a notable 23% of the sector's depreciation costs. These results underscore the relevant economic contributions of these local organizations. Despite their moderate scale relative to the whole sector, the guilds maintain a significant and stable footprint in value creation, employment, and regional economic cohesion).

Table 7 presents the data utilized to estimate the indirect economic value generated by the Catalan fishing sector. The indirect socioeconomic value is generated through the sector's extensive interactions with suppliers as "Consumption Expenditure". This includes the upstream value created in seafood processing, and equipment supply chains, which account for a significant portion of the sector's total operational expenditure. The valuation of these indirect contributions involves determining the proportion of turnover attributable to the Catalan fishing sector's expenditures relative to supplier revenues. This analysis ensures a precise estimate of the

sector's broader economic footprint and highlights its role in supporting regional supply chains and fostering additional economic activity across interconnected industries.

Table 5. Consumption expenditure of the Catalan Fishing Sector

DIRECT CONSUMPTION IN THE FISHING SECTOR 2022 (M EUR)	2021 (M EUR)	
Bait, salt, ice, containers and packaging	5.651,73	5.327,83
Aprovisionamientos	2.000,15	2.683,75
Arts	3.922,79	4.579,54
Spare parts, repair and maintenance	21.573,50	22.860,03
Fuels and lubricants	60.430,31	39.059,75
Other Services	7.053,21	5.984,78
Port Expenses	7.120,10	19.986,32
Other vessel expenses	5.217,16	8.492,40
Other non-fishing expenditure	8.362,56	8.446,82
Total	121.331,51	117.421,22

Source: Encuesta económica de pesca marítima 2022. Ministerio de Agricultura, Pesca y Alimentación. https://cpage.mpr.gob.es/ https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/2022_principales-resultados_encuesta-economica-pm_tcm30- 667818.pdf

Table 6. Social impact of Catalan Fishing Sector's indirect economic activity

SUPPLIERS	2022 (M EUR)	2021 (M EUR)
Direct consumption	121.332	117.421
Personnel expenses	21.840	21.136
Social Security	6.552	6.341
Income tax	4.611	4.462
VAT	25.480	24.658
Taxes	9.707	9.394
Added value	23.053	22.310

Source: Own elaboration, estimates of the taxes derived

5.2. The social value generated from local fishing activities

The social value generated by the Catalan fishing sector, also referred to as Social Specific Value (SSV), reflects the distribution of benefits across its principal stakeholders, incorporating a variety of social, economic, environmental, and cultural value variables. Annex 2 meticulously outlines the indicators and proxies utilized to compute the monetary value assigned to each identified variable, ensuring transparency and precision in the valuation process. Table 7 showcases the calculated monetary values, organized by categories of value variables, alongside the aggregate value generated.

Table 7. Social value generated by categories

	2021		2022	
CATEGORY	MONETARY VALUE	% S/TOTAL	MONETARY VALUE	% S/TOTAL
1. Assessed value of economic activity	€ 57.077.349	11,04%	€ 54.987.902	10,25%
2. Impact on local economic development	€ 222.706.531	43%	€ 244.617.531	46%
3. Environmental impact and conservation of marine resources	€ 74.426.293	14%	€ 63.331.454	12%
4. Impact on public health	€ 162.851.934	31%	€ 173.327.552	32%
TOTAL	**€ 517.062.108**	**100%**	**€ 536.264.439**	**100%**

The data highlights that in 2022, the Catalan fishing sector contributed an estimated €514.63 million in social value, a 4.1% increase with respect the previous year, reflecting its diverse and multifaceted impact on the region. While this figure is comprehensive, it acknowledges potential limitations due to the unavailability of certain data that may exclude some indirect or intangible contributions from the overall calculation.

The two primary drivers of this social value, constituting 78% of the total, are the sector's significant contributions to local economic development and its role in public health promotion. Specifically, the fishing sector supports local economies through job creation, food supply, and trade activities, while simultaneously enhancing public health through access to fresh fish, which is critical for the personal well-being. Meanwhile, the environmental impact and conservation represent 25% of the social value in 2021, decreasing slightly to 22% in 2022. This reduction stems largely from the declining number of vessels, with 98 vessels reduced in 2021 and 14 in 2022. Over the last decade, the fleet has experienced substantial contraction, with annual reductions of approximately 10% each year between 2019 and 2021. In more recent years, this trend has slowed, with reductions of 2% in 2022 and 1% in 2023.

While these reductions are pivotal for long-term environmental sustainability, the simultaneous expansion of short-distance fisheries raises concerns about increased environmental impacts. These activities contribute significantly to CO2 emissions, energy consumption, and other forms of pollution, possibly offsetting some of the environmental gains achieved through fleet reduction. Addressing these challenges is critical to balancing the sector's economic and social contributions with its ecological footprint.

The remaining 0.01% represents the assessed value of economic activity, capturing direct contributions such as value-added outputs. While the value added by the Catalan fishing sector appears relatively small in isolation, its broader impact on the local economy, environment, and public health is significant and far-reaching.

These findings highlight that the fishing sector's true value extends far beyond its direct economic outputs. Its capacity to drive social, environmental, and health benefits reinforces its position as a cornerstone of Catalonia's sustainable development. Therefore, recognizing and supporting the fishing sector is essential to maximize its extensive positive impacts on society.

Table 8 summarizes the allocation of the social value generated by the Catalan fishing sector across its key stakeholder groups. Complete information is provided in Annex 4.

Table 8. Social value generated by interest groups

INTEREST GROUP	MONETARY VALUE 2021	%S/ TOTAL	MONETARY VALUE 2022	%S/ TOTAL
Fishermen and Workers	76.384.573	15%	77.563.743	14%
Local Communities	66.577.746	13%	67.932.613	13%
Consumers	120.381.237	23%	125.142.477	23%
Governmental and Regulatory Bodies	67.283.711	13%	70.600.912	13%
Rest	186.434.841	36%	195.024.694	36%
Total	**517.062.108**	**100%**	**536.264.439**	**100%**

From the table above, it is evident that consumers are the primary beneficiaries of the social value generated by the Catalan fishing sector, accounting for 23% of the total value in both years. This significant share highlights the sector's vital role in ensuring food security and providing access to fresh, nutritious fishing products which directly supports public health and dietary needs across the region. Fishermen and Governmental regulatory bodies represent the second largest stakeholder groups, receiving 15% of the total value each. This share reflects the sector's direct impact on employment, wages, and livelihoods, underscoring its importance as a source of economic stability for individuals and families within fishing communities.

Local communities captured 13% of the social value in both years. This figure emphasizes the sector's integral role in stimulating local economies, fostering cultural preservation, and maintaining the social fabric in coastal areas where fishing is a cornerstone activity.

Finally, fish retailers, tourism, exports and other stakeholders received 34% of the total value. This demonstrates the sector's importance in driving economic activity along the supply chain, supporting businesses involved in processing, distribution, and trade.

5.3. Integrated social value

The Integrated Social Value (ISV) of the Catalan fishing sector

Table 9-a. 2021 Integrated Social Value Results for the Catalan Fishing Sector

	ECONOMIC RETURN TO PUBLIC ADMINISTRATIONS (R)	SOCIAL ECONOMIC VALUE (SEV)	SPECIFIC SOCIAL VALUE (SSV)	CONSOLIDATED SOCIAL VALUE
Direct impact of economic activities	28.335.115 €	128.415.027 €		128.415.027 €
Indirect impact of suppliers (commercial and investment)	46.348.637 €	48.532.604 €		48.532.604 €
Specific Social Value			517.062.108 €	517.062.108 €
Duplicate value in SEV and SSV				-57.077.349 €
Integrated Social Value (ISV)	74.683.752 €	176.947.631 €	517.062.108 €	636.932.389 €

Table 9-b. 2022 Integrated Social Value Results for the Catalan Fishing Sector

	ECONOMIC RETURN TO PUBLIC ADMINISTRATIONS (R)	SOCIAL ECONOMIC VALUE (SEV)	SPECIFIC SOCIAL VALUE (SSV)	CONSOLIDATED SOCIAL VALUE
Direct impact of economic activities	28.895.673 €	126.394.279 €		126.394.279 €
Indirect impact of suppliers (commercial and investment)	44.854.906 €	46.968.488 €		46.968.488 €
Specific Social Value			536.264.439 €	536.264.439 €
Duplicate value in SEV and SSV				-54.987.902 €
Integrated Social Value (ISV)	73.750.579 €	173.362.767 €	536.264.439 €	654.639.304 €

encapsulates both the direct and indirect impacts resulting from its economic activities and the contributions of its suppliers, respectively. Together, these elements form the Social Economic Value (SEV). Additionally, the ISV includes the Specific Social Value (SSV), which is derived directly from the sector's activities, such as its contributions to local economies, public health, and environmental sustainability. To ensure an accurate calculation of the ISV, it is necessary to aggregate the SEV and SSV while accounting for any overlaps or duplications between these values, ensuring a precise representation of the sector's total social contribution.

The ISV reveals a set of notable developments between 2021 and 2022. The ISV increased significantly from €636.9 million in 2021 to €654.6 million in 2022, driven by marked growth in Specific Social Value (SSV). While the SEV experienced a modest decline—from €176.9 million to €173.3 million—this reduction primarily reflects a decrease in contributions from direct economic activities, particularly in Net Value Added and supplier-related impacts. This drop may be indicative of the growing structural and economic challenges faced by the fishing sector. Which slightly reduces the economic contribution to the public administration from €74 million to €73 million.

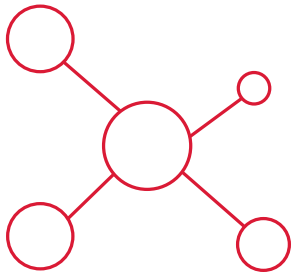
Nevertheless, the sector continues to maintain and even reinforce its overall social contribution. The SSV rose from €517.0 million to €536.2 million, highlighting the sector's increasingly vital role in delivering societal benefits such as environmental stewardship, coastal resilience, and public health promotion. Overall, the Catalan fishing sector demonstrated its resilience by sustaining a strong social footprint in the face of economic adversity, reinforcing its critical contribution to regional sustainability, community well-being, and long-term development.

Table 10. Indicators related to the UPF-BSM ISV

INDICATOR	RESULT 2022	RESULT 2021
Social value per € of turnover	6,66	6,64
Social value for each € of Investment in Agriculture, Fisheries and Food (Calalonian Public Budget)	1,66	1,98
Social value for every € in aid to fishermen's guilds, producer organisations, boat modernisation works	33,27	35,27

More specifically, for every euro of revenue, the sector generated 6.66 euros of social value in 2022, reflecting an improvement compared to the previous year. However, the social value per euro of investment in agriculture, fishing, and food decreased from 1.98 euros in 2021 to 1.66 euros in 2022. This decline is attributed to a significant increase in investments, which rose from 322.3 million euros to 395.05 million euros in 2022. While these investments are crucial for promoting long-term sustainability and innovation, their social impact has not yet materialized. Similarly, the social value generated per euro of aid to fishermen's guilds, producer organizations, and modernization initiatives slightly decreased, from 35.27 euros in 2021 to 33.27 euros in 2022. This corresponds to a modest increase in aid, from 18 million euros to 19.9 million euros. These aids include subsidies for fuel costs, as well as compensation aimed at mitigating the cost increases caused by the Russian invasion of Ukraine and addressing the reduction in fishing days, ensuring the continuation of services and covering part of the expenses incurred by the fishing confraternities of Catalonia and their federations, in the exercise of functions as collaborating entities of the Administration.

This change likely reflects the allocation of funds to long-term structural projects, such as fleet modernization and sustainable development measures, which require time to deliver tangible outcomes. These trends underscore the importance of aligning investment and aid strategies with both short-term and long-term social value objectives.



6. Conclusions

This study highlights the pivotal role of the Catalan fishing sector in generating substantial Integrated Social Value (ISV), reaching approximately €818 million in 2022, a notable increase from €771 million in 2021. This growth reflects the sector's significant contributions to economic development, public health, environmental sustainability, and the well-being of local communities. By categorizing the value into direct economic impacts, indirect effects through supply chains, and specific social contributions, the study demonstrates the broad influence of the sector's activities and its deep engagement with both local stakeholders and Catalan society as a whole.

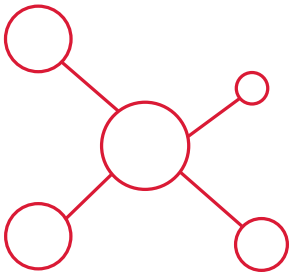
The findings emphasize the sector's capacity to align its operations with evolving societal priorities, including job creation, environmental conservation, cultural preservation, and access to fresh, nutritious fishing products. These priorities underscore the sector's essential role in fostering inclusive economic growth and addressing critical challenges such as food security and marine resource sustainability. By supporting livelihoods, preserving traditional practices, and enhancing dietary habits through omega-3-rich fish, the sector remains a cornerstone of public health and local economic resilience.

The majority of the social value derives from the sector's contributions to public health and local economic development, reinforcing its importance in sustaining communities, supporting fishermen, workers and fishing guilds, and promoting regional economic stability. The sector's commitment to sustainable fishing practices and marine conservation further ensures the long-term availability of marine resources, safeguarding ecological health for future generations.

Despite these achievements, the study highlights areas requiring attention, particularly the declining fiscal contributions to public administrations and reduced benefits to local communities. These trends are primarily linked to the ongoing downsizing of the fishing fleet. While in recent decades the decrease in the fleet has had a positive impact on environmental sustainability, as it has alleviated pressure on marine ecosystems, the current reduction of more than 50% may become a tipping point for the collapse of the fishing system. Furthermore, this situation presents significant challenges, as it reduces the sector's capacity to provide essential social benefits. Local fisheries are integral to economic stability, the preservation of cultural heritage, food security, and public health. They also play a critical role in reducing reliance on long-distance fisheries, which themselves contribute significantly to environmental impacts such as carbon emissions and energy consumption.

It is essential to find a balance between environmental goals and maintaining the social and economic benefits provided by local fishing. To achieve this, specific strategies must focus on optimizing resource management, maintaining the fleet, and ensuring the supply of local blue protein, as well as the livelihoods and well-being of fishing-dependent communities. By fostering this balance, the sector can continue to contribute significantly to regional resilience and sustainability.

In conclusion, the Social Value Study 2021-22 illustrates the comprehensive contributions of the Catalan fishing sector to stakeholders and society, providing a strategic foundation for advancing its social, economic, and environmental value creation. By leveraging insights from this analysis, the sector is well-positioned to enhance sustainable development, strengthen community resilience, and preserve marine ecosystems. Recognizing its wide-ranging impact ensures the sector's continued success as a critical pillar of Catalonia's economy, culture, and environmental stewardship for future generations. Special thanks are extended to the stakeholders, researchers, and collaborators who made this comprehensive assessment possible, reinforcing the sector's collective commitment to progress and sustainability.



7. Limitations

This report marks the first application of the Integrated Social Value (ISV) methodology to a sector-wide study, specifically targeting the Catalan fishing sector. Unlike prior studies that have partially addressed these dimensions, this analysis provides a comprehensive approach to quantifying the social value generated by the sector. However, several limitations should be acknowledged.

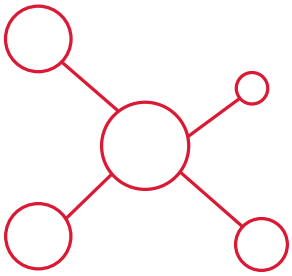
Firstly, the novelty of this methodology in the sector introduces inherent challenges. The absence of precedents means there is no directly comparable framework, requiring the adaptation of indicators and proxies from similar but distinct studies. While this pioneering approach sets a valuable baseline, future iterations will need to refine the methodology based on stakeholder input and evolving sectoral dynamics.

Secondly, the identification of stakeholders and value variables relied primarily on expert inputs and existing literature, rather than direct consultations with the affected parties. Subsequent studies should incorporate surveys and interviews to ensure a more representative and participatory approach. This engagement will help validate and prioritize value variables, ensuring they accurately reflect the interests and concerns of all stakeholders.

Thirdly, the selection of indicators and proxies presented significant challenges. The current approach is based on available data, which may not fully capture the sector's multifaceted contributions. Future efforts should focus on enhancing the precision and scope of these indicators, as well as developing robust proxies that better align with the identified value variables.

Lastly, while this report provides a preliminary quantification of the social value of proximity fisheries, it is primarily a first step. The aim is to establish a comparative quantitative framework that can evolve over time, allowing for more detailed assessments and longitudinal analyses. As the methodology matures, it will be essential to integrate more nuanced data and insights to provide a deeper understanding of the sector's value to society.

In summary, while this report lays the groundwork for a systematic evaluation of the Catalan fishing sector's social value, it also highlights the need for ongoing refinement, broader stakeholder engagement, and methodological advancements in future studies. These improvements will ensure a more comprehensive and accurate representation of the sector's contributions to sustainable development, regional resilience, and societal well-being.



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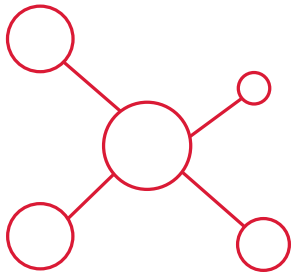

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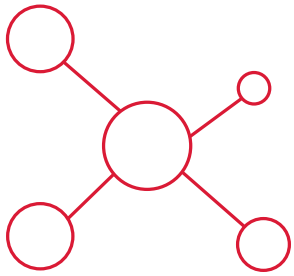

10. Annexes

Annex 1: Description of Value Variables

CATEGORIES	VALUE VARIABLES	DESCRIPTION
1. Impact of Fishing Activities	1.1: Value Added of Fishing activity	Economic contribution of the fishing sector, measured as the difference between the total market value of the products and services generated by the sector and the cost of the intermediate goods and services used in the production process.
2. Impact on local economic development	2.1: Contribution of the fishing sector to the local economy.	Economic impact that fishing-related activities have on a specific local area. This includes direct contributions such as employment, income generation, and production of fishery products, as well as indirect contributions through related industries such as retail and tourism
	2.2: Expansion of markets for Catalan fish products.	Volumen of exports of Catalan fish products
	2.3: Preservation of the fishing cultural heritage	Efforts made to safeguard and promote traditional fishing practices, customs, and knowledge that have been passed down through generations. This includes preserving fishing-related techniques, the social and cultural significance of fishing communities, and the intangible aspects of local fishing traditions
3.Environmental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	Non-market value of the ecosystem services provided by the Catalan coastal zone on the fishing areas that is preserved by the sustainable fishing techniques
	3.2: Restoration and protection of ecosystems and biodiversity	Catalan portion of the global economic cost of rebuilding marine life. Recovery rates across studies suggest that substantial recovery of the abundance, structure and function of marine life could be achieved by 2050, if major pressures are mitigated.
	3.3: Sustainable Fishing Activity	Economic value of the ecosystem services generated in the marine coastal strip of Catalonia due to sustainable fishing
	3.4: Environmental impact of local fisheries	Economic value of the investment in technology and awareness initiatives to address the sustainable needs of Catalan fisheries.
	3.5: CO2 impact of local fisheries	Economic value of the reduction in carbon dioxide emissions resulting from proximity fishing compared to long-distance fishing and imports.
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	The economic benefits of reduced energy consumption, driven by the elimination of refrigeration requirements for fish captured and sold locally, while ensuring public health safety
	4.2: Contribution of fishing to public health (consumption of fish and omega-3)	Economic value of the reduced medical costs associated with cardiovascular diseases, achieved through the consumption of fresh fish

Annex 2. Monetization of Social Value

CATEGORIES	VALUE VARIABLES	INDICATOR	VALUE INDICATOR 2022	VALUE INDICATOR 2021	PROXY	VALUE PROXY	TOTAL 2022	TOTAL 2021
1. Added value of the economic activity	1.1: Fishing activity	Indicator: Value added (EUR) Value added refers to the difference between the value of the total output of a sector and the value of the inputs used in the production process.	54.987.902	57.077.349	No proxy	-	54.988.901	57.077.349
2. Impact on local economic development	2.1: Contribution of the fishing sector to the local economy.	Indicator: Local consumption of fresh fish (Kg) in the territory of Catalonia (32% of the total catch)	6.761.582	6.383.055	Proxy: Difference in the price of fresh fish and alternatives (10€/kg).	10	67.615.821	63.830.550
		Indicator: Value added in the wholesale and retail trade of fish, shellfish, and other food products (EUR)	684.747	500.727	Proxy: percentage of product from local fishing	32%	219.119	160.233
		Indicator: Generation of indirect jobs derived from the fishing sector in manufacture and processing of marine products in Catalonia	5.086	4.662	Proxy: Average Salary in Marine Products Manufacturing and Processing Sector	16.500	83.927.092	76.927.998
	2.2: Expansion of markets for Catalan fish products.	Indicator: Volume of exports of fish and molluscs sold in regional and international markets. (EUR)	368.900.000	324.950.000	Proxy: Percentage of the Gross Value Added of exports (between 20% and 40%).	25%	90.380.500	79.612.750

CATEGORIES	VALUE VARIABLES	INDICATOR	VALUE INDICATOR 2022	VALUE INDICATOR 2021	PROXY	VALUE PROXY	TOTAL 2022	TOTAL 2021
	2.3: Preservation of the fishing cultural heritage	Indicator: Number of cultural events (festivals, fairs) related to fishing and community participation.	23	19	Proxy: Cost of organizing cultural events and their economic impact on local tourism.	75.000	1.725.000	1.425.000
		Indicator: Number of specific training hours for fishermen.	10.000	10.000	Proxy: Cost per hour of training and increase in productivity or average income of trained workers.	75	750.000	750.000
3.Environmental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	Indicator: Percentage of small-scale fishing vessels operating under a co-management model relative to the total fleet	28%	35%	Proxy: GVA (Gross Value Added) of the total fleet x co-management improvement factor. (The improvement factor is the increase in revenue per catch due to co-management).	962.459	269.488	336.860
	3.2: Restoration and protection of ecosystems and biodiversity	Indicator: percentage of the Catalan coast affected by the preservation plan worldwide (13% of the global coast is Spain and 6% is Catalonia)	0,78%	0,78%	Proxy: Cost to the fishing sector of the preservation and reconstruction of marine life until 2050. Estimated as 15% of the minimum cost (9,000 million USD per year globally)	1.350.000.000	10.530.000	10.530.000
		Indicator. Number of protected hectares.	1.119	1.119	Proxy: Value of the ecosystem service of protected areas (EUR/Ha/Year)	3.463	3.875.097	3.875.097
	3.3: Sustainable Fishing Activity	Indicator: Reduction in fishing effort, reduction in the number of vessels	-14	-98	"Proxy: Direct cost to the fishing community. Turnover per vessel (€98 million for 702 vessels = €139.601 per vessel)"	139.601	1.954.416	13.680.912
		Indicator: Kg of trawl catch adopted by selective fishing gear (Kg of total catch based on the percentage of vessels that have adopted it, 24%)	1.703.202	1.584.940	"Proxy: Difference in the price of certified and non-certified sustainable fish (€/kg)	10	17.032.020	15.849.401
	3.4 : Environmental impact of local fisheries	Indicator: Trawl vessels equipped with fly doors to reduce seabed impact, minimize fuel consumption, and improve trawling efficiency.	40	41	Proxy: Investment in sustainable boat technology	700.000	28.063.000	28.595.000
		Indicator: Number of environmental awareness campaigns.	23	23	Proxy: Cost per campaign and social value of raising awareness of marine sustainability.	4.413	101.488	101.488
		Indicator: Volume of marine debris collected by the fishing fleet participating in the "Pescaneta" program (in liters)	69.941	72.721	Proxy: Funds allocated to the Fishermen's Guilds (CP) for carrying out this task.	0	728.904	723.995
	3.5: CO2 impact of local fisheries	Indicator: Local consumption of fresh fish in the territory of Catalonia (32% of the total catch) (Kg)	6.761.582	6.383.055	Proxy: Savings in CO_2 emissions compared to transporting imported fish. (4.42kg CO2 /kg x 0.026€/kg CO2 = 0.11)	0,11	777.041	733.541

CATEGORIES	VALUE VARIABLES	INDICATOR	VALUE INDICATOR 2022	VALUE INDICATOR 2021	PROXY	VALUE PROXY	TOTAL 2022	TOTAL 2021
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	Indicator: Local consumption of fresh fish in Catalonia (32% of total catches) (Tn)	6.762	6.383	Proxy: energy cost to maintain the safety of cold or frozen food (750 kWh/Tn x €28.3/kWh = €21.225/Tn).	21.225	143.514.580	135.480.343
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	Indicator: Population consuming fresh fish and seafood derived from local fishing (catches * 32% / per capita consumption) (persons).	596.259	547.432	Proxy: Savings in medical cost per person by consuming Omega-3 (According to studies, omega-3 can reduce cardiovascular events by 10% and the cost is €500 per person per year, €50/person/year).	50	29.812.972	27.371.591
						Total	**536,264,439**	**517,062,108**

Annex 3. Social value by interest group

CATEGORIES	VALUE VARIABLES	STAKE-HOLDER	VALUE 2021	F	LC	C	GR	EO	R	X	T	H
1.Impact of Fishing Activities	1.1: Value Added of Fishing activity	F, LC, C, R, T	57.077.34	11.415.470	11.415.470	11.415.470			11.415.470		11.415.470	
2.Impact on local economic development	2.1: Contribution of the fishing sector to the local economy.	F, LC, C, R, T	140.918.781	28.183.756	28.183.756	28.183.756			28.183.756		28.183.756	
	2.2: Expansion of markets for Catalan fish products.	F, LC, X, C, R	79.612.750	15.922.550	15.922.550	15.922.550			15.922.550	15.922.550		
	2.3: Preservation of the fishing cultural heritage	F, LC, T	2.175.000	725.000	725.000						725.000	
3.Environ-mental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	F, LC, C, EO, GR	336.860	67.372	67.372	67.372	67.372	67.372				
	3.2: Restoration and protection of ecosystems and biodiversity	F, LC, C, EO, GR	14.405.097	2.881.019	2.881.019	2.881.019	2.881.019	2.881.019				
	3.3: Sustainable Fishing Activity	F, LC, C, EO	29.530.312	7.382.578	7.382.578	7.382.578		7.382.578				
	3.4: Environmental impact of local fisheries	F, EO, GR	29.420.483	9.806.828			9.806.828	9.806.828				
	3.5: CO2 impact of local fisheries	LC, EO, GR	733.541			244.514	244.514	244.514				
4.Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	C, GR, H	135.480.343			45.160.114	45.160.114					45.160.114
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	C, GR, H	27.371.591			9.123.864	9.123.864					9.123.864
Total			**517.062.108**	**76.384.573**	**66.577.746**	**120.381.237**	**67.283.711**	**20.382.311**	**55.521.776**	**15.922.550**	**40.324.226**	**54.283.978**

CATEGORIES	VALUE VARIABLES	STAKE-HOLDER	VALUE 2022	F	LC	C	GR	EO	R	X	T	H
1. Impact of Fishing Activities	1.1: Value Added of Fishing activity	F, LC, C, R, T	54.987.90	10.997.580	10.997.580	10.997.580			10.997.580		10.997.580	
2. Impact on local economic development	2.1: Contribution of the fishing sector to the local economy.	F, LC, C, R, T	151.762.031	30.352.406	30.352.406	30.352.406			30.352.406		30.352.406	
	2.2: Expansion of markets for Catalan fish products.	F, LC, X, C, R	90.380.500	18.076.100	18.076.100	18.076.100			18.076.100	18.076.100		
	2.3: Preservation of the fishing cultural heritage	F, LC, T	2.475.000	825.000	825.000						825.000	
3.Environ-mental impact and conservation of marine resources	3.1: Sustainable management of fisheries resources.	F, LC, C, EO, GR	269.488	53.898	53.898	53.898	53.898	53.898				
	3.2: Restoration and protection of ecosystems and biodiversity	F, LC, C, EO, GR	14.405.097	2.881.019	2.881.019	2.881.019	2.881.019	2.881.019				
	3.3: Sustainable Fishing Activity	F, LC, C, EO	18.986.436	4.746.609	4.746.609	4.746.609		4.746.609				
	3.4 : Environmental impact of local fisheries	F, EO, GR	28.893.392	9.631.131			9.631.131	9.631.131				
	3.5: CO2 impact of local fisheries	LC, EO, GR	777.041			259.014	259.014	259.014				
4. Impact on public health	4.1: Contribution of local fishing to energy saving and safety in public health	C, GR, H	143.514.580			47.838.193	47.838.193					47.838.193
	4.2: Contribution of fishing to public health (consumption of fish and omega-3).	C, GR, H	29.812.972			9.937.657	9.937.657					9.937.657
Total			**536.264.439**	**77.563.743**	**67.932.613**	**125.142.477**	**70.600.912**	**17.571.670**	**59.426.087**	**18.076.100**	**42.174.987**	**57.775.851**

	CP ARENYS		CP BADALONA		CP BARCELONA		CP BLANES		CP CAMBRILS		CP DELTEBRE		CP EL PORT DE LA SELVA		CP L'AMETLLA		CP L'AMPOLLA		CP LES CASES D'ALCANAR	
Description	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Salaries	239,71	256,61	24,95	21,05	428,79	340,11	405,93	412,03	185,24	173,58	136,14	143,73	136,76	135,36	287,62	209,56	42,40	15,99	108,76	103,36
	Social Security	59,95	70,43	8,06	6,36	0,86	98,05	133,83	127,75	53,31	51,00	44,24	46,51	32,87	36,63	83,16	64,71	7,48	2,91	34,42
	Income Tax	7,22	3,46	0,54	0,76	6,16	6,60	11,68	10,40	-	-	4,07	6,41	-	-	-	-	-	-	4,16
Corporate tax	-	-	-0,84	28,23	4,35	-	-1,85	-1,60	-32,65	-	-	-	52,45	40,48	23,93	-8,36	7,69	13,83	-	-
	Value Added	- 48,49	-46,47	-44,47	50,17	83,64	107,35	72,04	63,80	161,59	26,33	50,00	33,01	4,83	9,18	71,80	53,94	23,21	44,62	-11,69
	Depreciation	15,92	15,93	6,43	5,34	89,20	93,32	98,80	90,93	27,35	30,11	33,78	34,25	67,47	70,33	19,05	20,55	2,54	2,60	17,32
	VAT	-0,30	5,75	0,13	0,13	5,96	4,81	2,73	3,59	21,84	15,37	0,32	6,37	16,69	18,43	9,95	10,93	3,69	9,62	2,83
TOTAL	274,01	305,71	-5,20	112,04	618,97	650,24	723,17	706,89	416,68	296,39	268,54	270,28	311,06	310,40	495,52	351,33	87,03	89,58	155,81	175,22

	CP L'ESCALA		CP LLANÇÀ		CP PALAMOS		CP ROSES		CP S FELIU		CP TARRAGONA		CP TORRE-DENBARRA		CP VERGE DEL CARME - LA RÀPITA		CP VILANOVA		TOTAL	
Description	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Salaries	110,57	116,82	148,72	146,17	372,44	376,88	532,24	469,83	118,20	120,26	588,63	588,75	19,95	19,91	499,50	516,63	453,45	444,57	4.840,01	4.611,19
Social Security	35,56	35,00	59,22	39,16	101,09	106,35	151,90	201,25	34,63	28,36	124,59	167,91	6,14	6,30	123,29	141,08	130,05	138,86	1.224,65	1.401,56
Income Tax	6,21	4,36	5,60	4,86	9,45	9,83	0,01	12,40	6,02	5,07	19,49	-	-0,00	-0,00	9,19	9,90	9,78	9,78	99,60	87,96
Corporate tax	-	-	-	-	-8,02	-11,29	-	12,22	-	-	-	-	-	-	-	-	-	-	45,06	73,50
Value Added	14,55	-10,07	10,70	32,70	-20,00	56,86	3,78	42,86	-15,97	-8,79	83,98	66,32	-0,00	0,00	-98,35	-153,95	-21,75	-157,79	319,40	215,43
Depreciation	46,47	45,94	14,36	12,82	81,54	83,31	109,99	76,06	1,47	10,59	196,87	199,66	8,45	5,82	51,91	80,90	147,58	139,71	1.036,52	1.044,89
VAT	-	1,73	18,11	15,68	10,78	8,62	6,51	12,98	-	-	82,62	37,98	0,46	0,50	17,85	14,45	-	-	200,17	169,63
TOTAL	**213,35**	**193,78**	**256,71**	**251,39**	**547,30**	**630,55**	**804,43**	**827,60**	**144,35**	**155,49**	**1.096,19**	**1.060,61**	**35,00**	**32,52**	**603,40**	**609,00**	**719,10**	**575,12**	**7.765,42**	**7.604,15**

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