DELIVERABLE 2.1

Report on the key social and economic aspects of regional fisheries

Version 2.0

WP 2
Deliverable 2.1
Lead Beneficiary: ATHENA
Topic: Shaping ecosystem based fisheries management
Grant Agreement No: 101000318
Dissemination level: PU
Date: 05.10.2022

Please cite this work as: Plataniotis, A., Koundouri, P., Stratopoulou, A., Rindorf, A., Jacobsen, N. S., Brown, E., Bastardie, F., Savina Rolland, M., Maroño, S. S., Andres, M., Garcia, D., Uhlmann, S., Reid, D., Romagnoni, G., Spedicato, M.-T., Lembo, G., Bitetto, I., Liontakis, A., Vassilopoulou, C., Papadopoulou, N., Taylor, M., Kempf, A., Stelzenmüller, V., Depestele, J., Hamon, K., Kraan, M., Northridge, S., Muench, A., Voss, R., Eliasen, S. Q., Frangoudes, K., Heath, M., Moalla, N., Melia, P., Poos, J. J. and Binch, L. (2022): SEAwise Report on the key social and economic aspects of regional fisheries. Technical University of Denmark.
https://doi.org/10.11583/DTU.21221021

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SEAwise has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000318

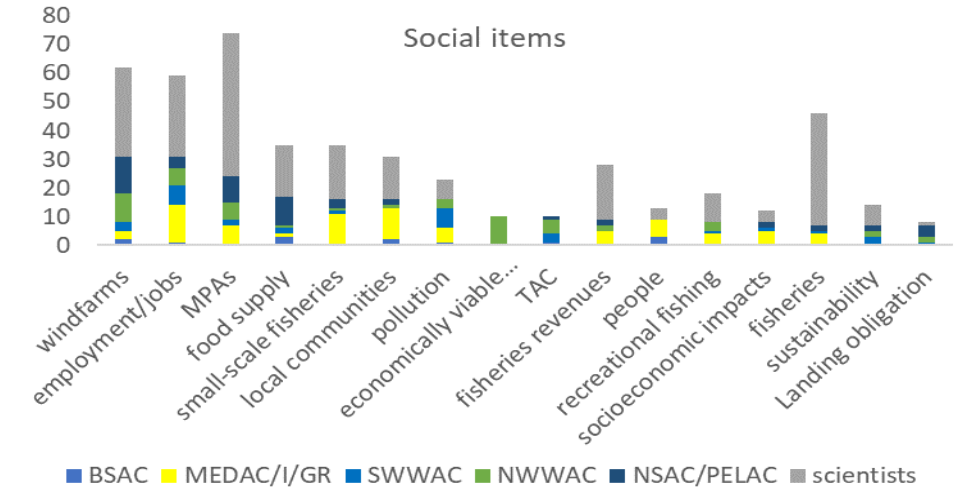
SEAWISE

Executive summary

Fishing is a human activity with various social and economic implications. In most countries, those implications are key factors to consider when deciding on specific management strategies. In this report, the fisheries management strategies implemented in the different European marine regions are reviewed, and relevant indicators, models and tools that can be used to predict the effectiveness of these strategies, from a social and economic point of view are identified. The objective was to identify the critical social and economic aspects of fisheries, relevant social and economic indicators, and regionally-relevant management measures to be considered in the evaluations of different management strategies later in the project.

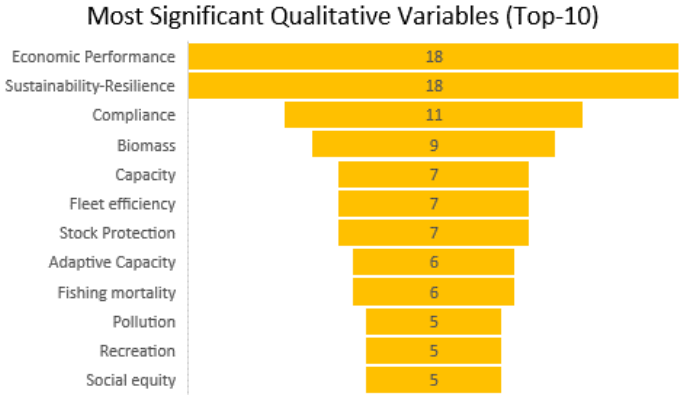
The scoping consultations and systematic reviews identified a long list of potentially relevant key social and economic aspects and management measures. Among these, the most frequently mentioned items identified in scoping with stakeholders were windfarms, employment/jobs, MPAs, food supply, small-scale fisheries, local communities and pollution. The systematic review identified landings (volume or value), effort (days at sea), fuel costs, number of vessels, profit, aspects of costs, economic performance, sustainability-resilience, compliance and capacity as frequently occurring topics. The fisheries management policies most frequently mentioned were effort control, landing obligation, Individual Transferable Quota (ITQ), MPAs and TAC. Among the papers analyzed, more than 30%, concerned the Mediterranean region, followed by Western Waters, the North Sea and the Baltic Sea, indicating a higher contribution of Mediterranean studies to the conclusions.

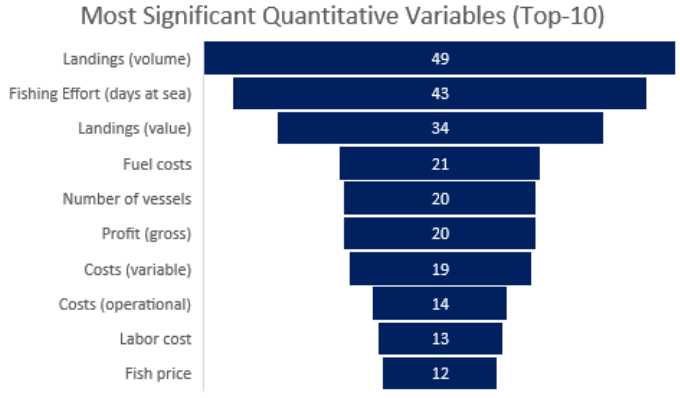
Aspects identified frequently in both scoping and in systematic reviews included MPAs and small-scale fisheries, which were all identified in both methods as frequently occurring. However, there were also aspects which appeared to be represented differently in the evaluations (e.g. employment and local communities) indicating discrepancies between the available knowledge and that sought by the end users.



Social impacts on and of fisheries

Issues identified by most stakeholders as key (top left) and the top 10 occurring issues in papers investigated as qualitative (bottom left) and quantitative (bottom right) variables.





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1. SEAwise background

The SEAwise project works to deliver a fully operational tool that will allow fishers, managers, and policymakers to easily apply Ecosystem-Based Fisheries Management (EBFM) in their fisheries. With the input from advice users, SEAwise identifies and addresses core challenges facing EBFM, creating tools and advice for collaborative management aimed at achieving long-term goals under environmental change and increasing competition for space. SEAwise operates through four key stages, drawing upon existing management structures and centred on stakeholder input, to create a comprehensive overview of all fisheries interactions in the European Atlantic and Mediterranean. Working with stakeholders, SEAwise acts to:

- Build a network of experts - from fishers to advisory bodies, decision-makers and scientists - to identify widely-accepted key priorities and co-design innovative approaches to EBFM.
- Assemble a new knowledge base, drawing upon existing knowledge and latest insights from stakeholders and science, to create a comprehensive overview of the social, economic, and ecological interactions of fisheries in the European Atlantic and Mediterranean.
- Develop predictive models, underpinned by the new knowledge base, that allows users to evaluate the potential trade-offs of management decisions, and forecast their long term impacts on the ecosystem.
- Provide practical, ready-for-uptake advice that is resilient to the changing landscapes of environmental change and competition for marine space.

The project links the first ecosystem-scale impact assessment of maritime activities with the welfare of the fish stocks these ecosystems support, enabling a full-circle view of ecosystem effects on fishing productivity in the European Atlantic and Mediterranean. Drawing these links will pave the way for a whole-ecosystem management approach that places fisheries at the heart of ecosystem welfare. In four cross-cutting case studies, each centred on the link between social and economic objectives, target stocks and management at a regional scale SEAwise provides:

- Estimates of impacts of management measures and climate change on fisheries, fish and shellfish stocks living close to the bottom, wildlife bycatch, fisheries-related litter and conflicts in the use of marine space in the Mediterranean Sea,
- Integrated EBFM advice on fisheries in the North Sea, and their influence on sensitive species and habitats in the context of ocean warming and offshore renewable energy,
- Estimates of effects of environmental change on recruitment, fish growth, maturity and production in the Western Waters,
- Critical priorities for integrating changes in productivity, spatial distribution, and fishers' decision-making in the Baltic Sea to create effective EBFM, prediction models.

Each of the four case studies will be directly informed by expert local knowledge and open discussion, allowing the work to remain adaptive to change and responsive to the needs of advice users.

1.1 The role of this deliverable

This report describes the approach taken to complete steps 1 and 2 of the SEAwise EBFM concerning the social system:

1. Identify the stakeholder community, and with them, maps of the ecoregions, their species and habitats, stakeholder interests and responsibility;

2. Establish ecological and social system priorities under current legislation and regulation, determine significant factors influencing these priorities, conduct susceptibility analysis and identify potential management strategies through co-design workshops and systematic reviews

1.2 Contributors

Name	Institute	Key review driver	Workshops
Phoebe Koundouri*	ATHENA	X	
Angelos Plataniotis*	ATHENA	X	
Artemis Stratopoulou	ATHENA	X	
Anna Rindorf	DTU Aqua		X
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* Task 2.1 Lead. **WP2 lead

1.3 Acronyms and abbreviations

CS	Case Study
DOI	Digital Object Identifier
EBFM	Ecosystem-Based Fisheries Management
FMP	Fisheries Management Policies
ITQ	Individual Transferable Quota
MPA	Marine Protected Area
PDF	Portable Document Format
PET	Protected, Endangered, Threatened species
TAC	Total Allowable Catch
TCA	Trade and Cooperation Agreement
WoS	Web of Science
WP	Work Package
x.1	All review tasks for work packages two through six

2. Aims of scoping consultations and systematic reviews

The SEAwise stakeholder integration aims to ensure that the critical issues of relevance for the social system and potential management measures are identified and prioritised for further evaluation in the project and hence that the results are relevant to the end-users. The SEAwise scoping consultations in the first half-year of the project had the following specific aims

- To build trust and shared understanding between SEAwise participants and identified stakeholders.
- To identify critical issues of relevance for ecosystem-based fisheries advice, current ecosystem status and potential management measures
- To identify the priorities of these critical issues and evaluate how this varies between individuals
- To compare results between regions and group sessions
- To compare results between different scoping methods within a region

The methods used in scoping consultations are described in deliverable report D1.1 available here.

In developing and implementing operational EBFM, SEAwise is building upon years of knowledge and research, which is both rich and sparse, depending on the subject area, geographical area and ecosystem components in question. The aim of this deliverable is to collate the knowledge on social and economic aspects of fisheries, fisheries management measures and relevant social and economic indicators through the application of standardised systematic review methods described in Deliverable 1.1. Systematic Reviews provide exhaustive summaries of current knowledge and clearly document the methods used. The reviews are performed in four steps: 1. framing of research question, 2. identification of relevant work, 3. assessment of the quality of studies, and 4. summary of the evidence and interpretation of the findings. The approach provides transparency and allows later updates as more information becomes available. Together with the scoping consultations, the reviews will identify relevant key social and economic aspects and regionally-relevant management measures to be considered in the evaluations of different management strategies.

3. Scoping consultations

The aim of the stakeholder consultation will impact the choice of the most appropriate consultation method. The choice of consultation method was therefore carefully considered in advance. Specific attention was given to minimise the impact of the organising scientists' expectations and emergent group dynamics on group results. Comparability of results was ensured by using standard methods in all regions and group sessions.

Three different approaches were used to identify critical issues of relevance, current ecosystem status and potential management measures (Individual consultation, individual consultation in a group environment and group consultation). Two approaches are used to identify the priorities of these critical issues and evaluate how this varies between individuals (Individual consultation, individual consultation in a group environment). The combination of these methods allowed the identification of key priorities with and without group dynamics. The key issues were discussed in further detail in a group consultation to allow a shared understanding of their definition. Additional information about the methods can be found in Deliverable 1.9.

3.1 Mediterranean Sea scoping for WP2

The social and fisheries words identified by at least four of the stakeholders consulted were employment/jobs, local communities, small-scale fisheries, MPAs, profit, revenue, people, socioeconomic impacts, control, medium-scale

fisheries and pollution (fig. 3.1). This list contained several words not identified by the scientists participating in SEAwise.

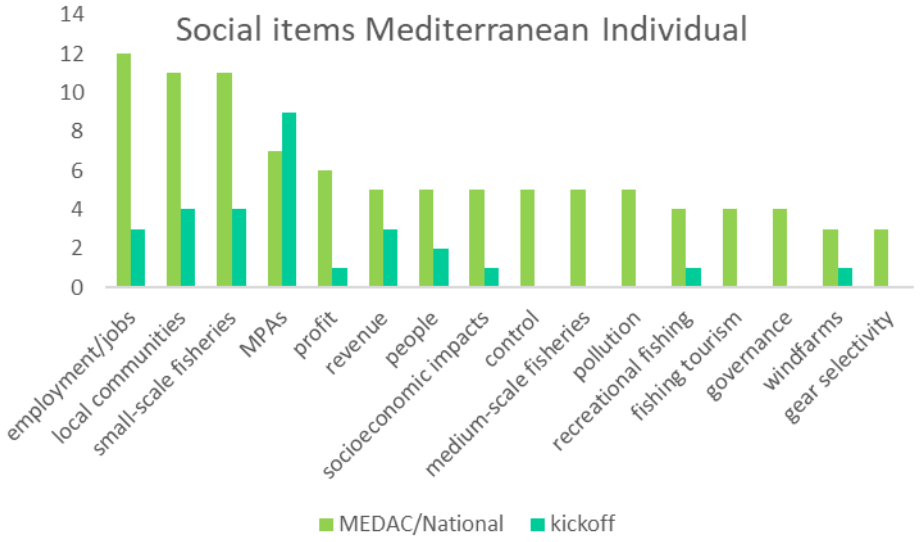


Fig. 3.1. Words identified for fisheries and social aspects in the scoping exercises were ordered by frequency of occurrence among stakeholder input. The frequency of occurrence among the SEAwise scientists is given for comparison.

3.2 Western Waters scoping for WP2

The social and fisheries words identified by at least three of the stakeholders consulted were employment/jobs, windfarms, MPAs, TAC, coastal communities, co-management, economically viable fishing industry, economics, food security and the landing obligation (fig. 3.2).

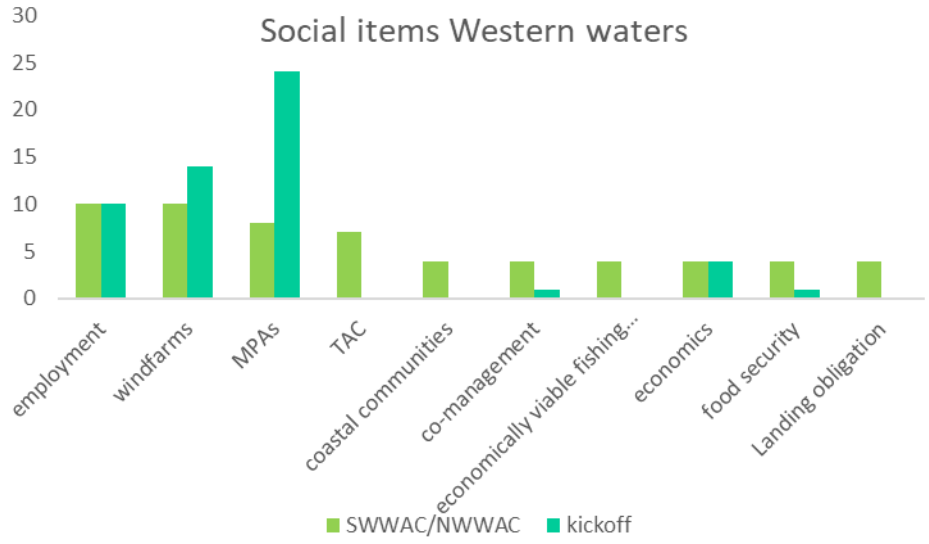


Fig. 3.2. Words identified for fisheries and social aspects in the scoping exercises were ordered by frequency of occurrence among stakeholder input. The frequency of occurrence among the SEAwise scientists is given for comparison.

3.3 North Sea scoping for WP2

The social and fisheries words identified by at least four of the stakeholders consulted were MPAs, employment/jobs, food supply, Brexit, Carbon storage, food security, large-scale fisheries and small-scale fisheries (fig. 3.3).

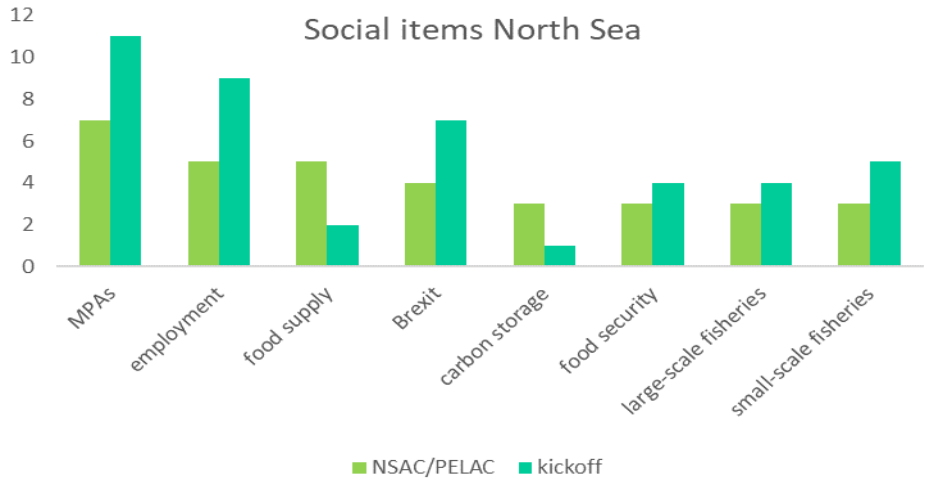


Fig. 3.3. Words identified for fisheries and social aspects in the scoping exercises were ordered by frequency of occurrence among stakeholder input. The frequency of occurrence among the SEAwise scientists is given for comparison.

3.4 Baltic Sea scoping for WP2

The social and fisheries words identification by stakeholders for the Baltic Sea was postponed and instead, the terms identified by SEAwise participants are given in fig. 3.4. The words identified by at least three BSAC participants were recreation, food supply, people, land-sea interactions and small-scale fisheries (fig. 3.4).

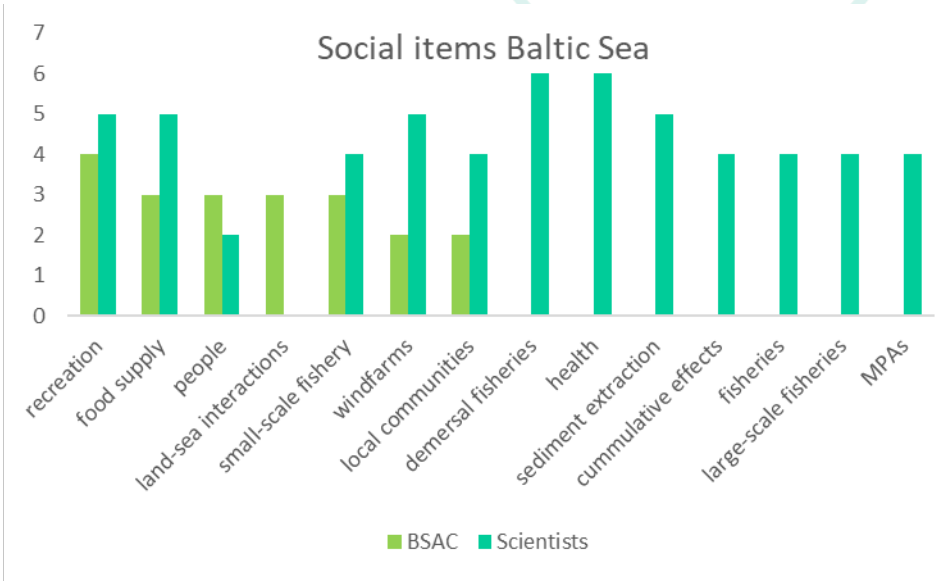


Fig. 3.4. Words identified for fisheries and social aspects in the scoping exercises ordered by frequency of occurrence among BSAC participants and SEAwise scientists. Only words mentioned at least 3 (BSAC) and 4 (Scientists) times included.

3.5 Items identified most frequently across regions

There were 22 items identified at least 5 times in the scoping with stakeholders (Figure 3.5). The top 5 by frequency were windfarms, employment/jobs, MPAs, food supply, small-scale fisheries, local communities and pollution (the three last items shared frequency). While the order of the frequencies were slightly different, these five items were also identified as highly relevant aspects when consulting SEAwise partners.

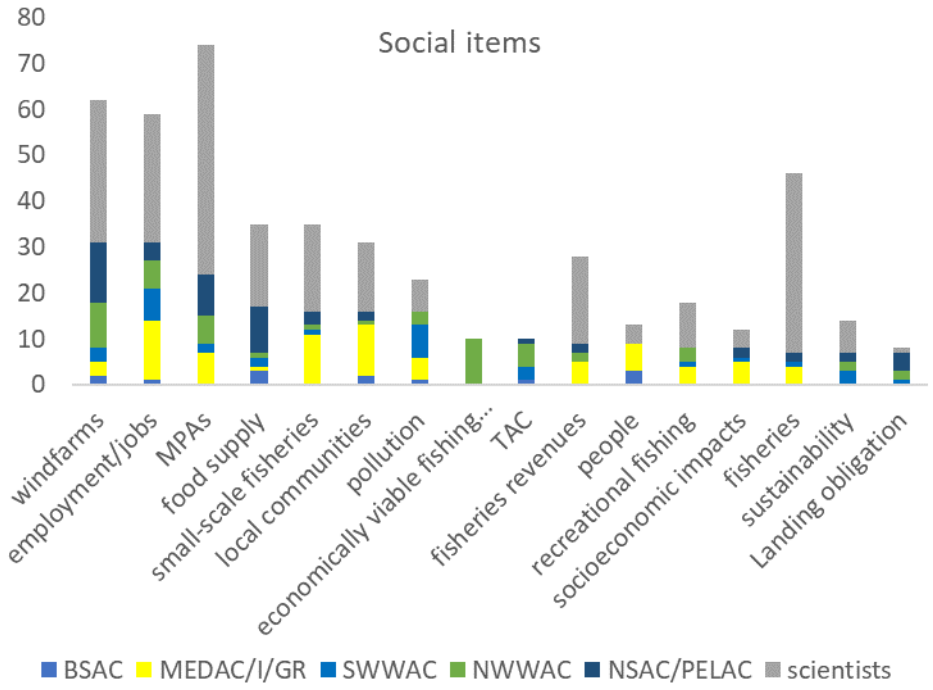


Fig. 3.5. Words identified for fisheries and social aspects in the scoping exercises across all regions ordered by frequency of occurrence among stakeholder input. The frequency of occurrence among the SEAwise scientists is also given for comparison. Only words mentioned 7 or more times are included.

4. Systematic reviews

The systematic reviews provide exhaustive summaries of current knowledge and clearly document the methods used. The approach provides transparency and allows later updates as more information becomes available and is described in more detail below. The systematic reviews encompass six steps:

- Framing of the research question
- Scoping to define search terms
- Screening of studies
- Data extraction
- Description of the database produced

Following these steps, a presentation of the outcome of the systematic review.

The literature review was conducted by a team of 27 persons from 17 different institutions. The papers identified in the search were allocated to the 27 participants for screening, which means that they had to read the title, the abstract and the keywords of the papers in their list and decide whether to include or exclude them for the next phase (data extraction), according to specific exclusion criteria shared with them. The included papers were then allocated to the 27 persons. Included papers were read (whole paper) and either excluded according the same criteria as in the screening phase or used to extract specific bits of information, according to the data extraction template. After the collection of the individual data extraction results, the information was homogenized and processed.

While the aim of a systematic review is to be transparent and reproducible, the results of the review are still to some extent influenced the participants. A number of measures were however taken to minimize this. As it is difficult to produce an exhaustive list of search terms that includes all possible terms and their combinations, the list used here was the result of a participatory process with ideas and suggestions from experts in the field of economic and social dimensions. Different levels of understanding of the exclusion criteria distributed to the screeners may also affect the results. To minimize this effect, a pre-screening exercise was conducted where 9 volunteers tested the exclusion criteria on a list of 30 randomly selected papers. The final list of exclusion criteria was refined based on their feedback. There can also be subjectivity during the data extraction phase. To minimize this, a few papers were tested by a small group of people, before the start of Data Extraction. In this phase, the whole paper was read, and not only the title, the abstract, and the keywords, as in the screening.

Under data extraction, participants recorded the perceived impact of a fisheries policy. While in most papers this was straightforward, there were a significant number of documents where the reader would have to judge the economic, social and environmental implications of a policy. Finally, the evaluation of quality characteristics of the papers, such as the suitability of the data for Temporal and Spatial Resolution, as well as the method chosen for inference may also be dependent on the participants.

4.1 Framing of the research question

The aim of the systematic review is to identify the key social and economic aspects of fisheries and to identify relevant social and economic indicators and the fisheries management properties to which they are linked.

4.2 Scoping to define search terms

In Task 2.1 the review was conducted at the European level because focusing on specific Case Study areas would not capture all relevant information on the socio-economic impact of fisheries management policies. Therefore, the CS search terms were extended to include also the name of all countries in the European area (Table 1).

The search string consisted of the *spatial* and the *WP2-specific* variables, separated by the operator 'AND'. The *economic* parameters and *social/environmental* parameters were separated by the operator 'OR', to capture papers dealing either with both or with one of the two aspects, according to T2.1's objectives.

Under each variable, the terms were separated by 'OR'. The structure of the search query had the following form:

Spatial **AND** Impact **AND** Fisheries Management **AND** Modelling parameters **AND** Economic parameters **OR** Social / Environmental parameters **AND** Gear / Fleet scale **AND** Target Species

For the search terms under each variable, the experts involved in Task 2.1 were consulted to ensure that the search is complete and accurate.

Target species is a combination of the target species that emerged from the scoping of Case Studies, after the removal of the duplicates.

For all variables, the search to decide if the paper is relevant for the review or not was performed within the title, abstract and keywords. In the case of *Target Species,* the search was also performed throughout the text, because target species were rarely named in the title, abstract and key words.

The complete lists of search terms are listed by element in Table 1.

Table 1. Task 2.1 variables and terms used in the search string.

Spatial	Impact	Fisheries Management	Modelling parameters	Economic parameters	Social / Environmental	Gear / Fleet scale	Target Species
"Adriatic Sea"	"fishing activity"	"access control*"	"Bio-economic"	"Days at sea"	"Adaptive Capacity"	"beach seine"	"Aristaeomorpha foliacea"
"Aegean Sea"	affect*	"allocation of rights"	"Data Envelopment Analysis"	"Earnings Before Interest and Taxes"	"Alternative livelihood"	"bottom trawlers"	"Aristeus antennatus"
"Aegean-Levantine Sea"	Commercial*	"catch limit*"	"Economic model"	"Economic performance"	"casual employment"	"demersal fisher*"	"Benthic species"
"Alboran Sea"	Compet*	"effort regime"	"Multi-Criteria Decision Analysis"	"Energy consumption"	"child labor"	"demersal trawlers"	"Clupea harengus"
"Balearic Sea"	comprom*	"fish* management"	"Soci* model"	"Energy cost"	"climat* change"	"Distant-water fleet"	"Dicentrarchus labrax"
"Baltic Proper"	effect*	"fisher* system*"	"Stochastic Frontier Analysis"	"Fishing days"	"Coastal Development"	"Large-scale fleet"	"Elasmobranch species"
"Baltic Sea"	enhance*	"fishing effort limit"	BEMTOOL	"fuel consumption"	"community right*"	"Lost fishing gears"	"Engraulis encrasicolus"
"Barents Sea"	exploit*	"Landing obligation"	DEA	"fuel price"	"cultural values"	"Mixed deepwater"	"Flatfish species"
"Bay of Biscay"	impact*	"management strategy evaluation"	Decision?making	"Gross profit"	"food system"	"Mixed Fisher*"	"Gadus morhua"
"Black Sea"	influen*	"marine protected area"	Economic	"Gross Value Added"	"Foreign labour"	"Mobile fishing gears"	"Lepidorhombus whiffiagonis"
"Cantabrian Sea"	Integr*	"Quota allocation"	FLBEIA	"Net profit"	"global warming"	"Multi-fleet"	"Melanogrammus aeglefinus"

Spatial	Impact	Fisheries Management	Modelling parameters	Economic parameters	Social / Environmental	Gear / Fleet scale	Target Species
"Celtic Sea*"	press*	"Quota management"	GARCH	"Net Value Added"	"human health"	"Multi-stock"	"Merlangius merlangus"
"Eemian Sea"	shap*	"rights allocation"	indicat*	"non-variable costs"	"human trafficking"	"Passive fishing gears"	"Merluccius merluccius"
"English Channel"		"spatial planning"	MCDA	"Number of vessels"	"income diversification"	"pelagic trawlers"	"Mullus barbatus"
"European waters"		"technical measures"	SFA	"operational cost*"	"indigenous right*"	"pelagic trawls"	"Mullus surmuletus"
"Ionian Sea"		"Territorial Use Rights"	soci*	"Personnel cost*"	"informal employment"	"polyvalent passive"	"Neogobius melanostomus"
"Irish Sea"		"total allowable catch"	socio?economic	"Repair & maintenance cost*"	"Job satisfaction"	"purse seine"	"Nephrops norvegicus"
"Kattegat"		"Trade and Cooperation Agreement"	Utilit*	"Value of landings"	"labor right*"	"Purse seiners"	"Parapenaeus longirostris"
"Ligurian Sea"		allow*		"Value of unpaid labour"	"labour right*"	"Small-scale"	"Platichthys flesus"
"Malin Sea"		licenc*		"variable costs"	"Land based industry"	business	"Platichthys solemdali"
"Mediterranean Sea"		MPA		"vessel power"	"Marine litter"	DWF	"Pleuronectes platessa"
"North Sea"		MSE		"weight of landings"	"Marine traffic"	Family	"Pollachius pollachius"
"North*east Atlantic"		policies		consumption	"migrant work*"	gillnets	"Pollachius virens"
"Norwegian Sea"		policy		cost*	"Oil and gas"	hooks	"Salmo salar"
"Sea of Sicily"		regul*		crew	"property right*"	industrial	"Salmo trutta"
"Skagerrak"		restrict*		EBIT	"public health"	longliners	"Sardina pilchardus"
"Tyrrheanian Sea"		TAC		efficien*	"seasonal employment"	LSF	"Scomber scombrus"
"United Kingdom"		TCA		financ*	"share system"	Netters	"Small pelagic species"
"West Coast of Scotland"		TURF		FTE	"slave labor"	Pots	"Solea solea"
"Western Mediterranean"				GVA	"Social benefits"	SSCF	"Sprattus sprattus"
Albania				income	"social care"	Traps	"target species"
Belg*				performance	"social impact"	Trawl	"Trachurus trachurus"
Britain				producti*	"social rights"	Trawler*	"Trisopterus esmarkii"
British				profit*	"social security"		Ammodytes
Bulgar*				Revenue	"standard of living"		Deepwater
Croat*				tax*	"value chain"		Demersal
Cypr*				tonnage	"working conditions"		Engraulidae
Danish				Turnover	"youth labo?r"		Flatfish
Denmark					Age		Gadoids
Deutsche					Biodiversity		landings
Dutch					biomass		Lophius
Eston*					bribery		Pelagic
Finland					citizens		Sardine
Finnish					Community		
France					Compliance		
French					conflict		
Germany					consumer		
Greece					Contamin*		
Greek					corruption		

Spatial	Impact	Fisheries Management	Modelling parameters	Economic parameters	Social / Environmental	Gear / Fleet scale	Target Species
Iceland*					cultur*		
Ireland					demographic		
Irish					depend*		
Ital*					discrimin*		
Latvia					diversification		
Lithuania					education		
Malt*					Employment		
Netherlands					environment*		
Norw*					Eutroph*		
Poland					food		
Polish					gender		
Portug*					governance		
Romania					harassment		
Slovenia					health		
Spain					household		
Spanish					identity		
Swed*					livelihood		
Turk*					local macro?economic		
					market		
					nationality		
					Participation		
					perception		
					Pollut*		
					processing		
					recreat*		
					resilien*		
					safety		
					sentiment		
					share		
					Shipping		
					social		
					societ*		
					stakeholders		
					subsid*		
					sustainab*		
					touris*		
					tradition*		
					wages		
					well?being		
					women		

4.3 Screening of studies

SCOPUS and “Web of Science” databases were used and the return of the query run in each one, on 11 February 2022, was as follows:

- SCOPUS: 1048 papers
- Web of Science: 351 papers

The resulting records were combined and duplicates were removed. This resulted in 1,087 unique records being allocated to the 27 participants of T2.1.

The "screeners" read the abstract of each paper in the list assigned to them and then decided whether to ***accept*** it for the data extraction phase or ***Reject*** it as irrelevant, according to the following exclusion criteria and guidance provided to them:

- **Location**. If the study refers to a site OUTSIDE the European Area[1],[2] -> **EXCLUDE** (Code "Loc")
- **Language**. IF the study is NOT written in English -> **EXCLUDE** (Code "Lang")
- **Publish Year**. If the study is published before 2012 -> **EXCLUDE** (Code "Year")
- **Temporal**. If the study is about historical facts of fisheries[3] -> **EXCLUDE** (Code "Temp")
- **Target Species**. If the study considers species OUTSIDE our scope[4] -> **EXCLUDE** (Code "Targ")
- **Gear / Fleet scale**. If the study considers Gear types or Fleet scales that are NOT in our scope[5] -> **EXCLUDE** (Code "Gear-Fleet")
- **Ecosystem**. If the study refers to NON-MARINE Ecosystems, e.g. rivers, lakes, etc. -> **EXCLUDE** (Code "Ecos")
- **Study Type**. If the paper is a non-empirical study, e.g Lit Reviews, Methodological papers, etc.,[6] -> **EXCLUDE/REVIEW** (Code "Type")
- **Evidence**. If the paper DOES NOT refer to at least ONE of the following -> **EXCLUDE** (Code "Evid")
    - **OR** Fisheries Management AND (social OR economic aspects of fisheries)[7]
    - **OR** Fishing Activity AND Bio-economic modelling (including Economic and climate impacts of fishing)[8]
    - **OR** Social impact of management measures on fisheries[9]
    - **OR** Effective fisheries governance[10]
    - **OR** Health impact of different fish and fish sizes[11]

A total of 27 people participated in Task 2.1. The person responsible for screening a specific document was indicated in excel files distributed to them.

Following the 4-eyes principle, each paper was reviewed by 2 people, *screener 1* and *screener 2*. All screening results were reviewed by the person in charge of Task 2.1 who also had the role of *super-screener*, to decide whether a paper would be included or excluded from further analysis, in case there was disagreement between the screeners.

[1] Consult the list "**Spatial**".

[2] In the Mediterranean Case Study, we are particularly interested in South Adriatic Sea and Eastern Ionian Sea (GSAs 18 and 19) and Eastern Ionian Sea (GSA 20). Therefore, studies in the Mediterranean area of Non-European countries were excluded unless they referred to a t least one of these areas .

[3] Some papers study fishing activities in past decades or centuries. These need were excluded. An example of exclusion is the study: "Hoffmann R.C., 2015, Salmo salar in late medieval Scotland: competition and conservation for a riverine resource".

[4] Consult the list "**Target Species**"

[5] Consult the list "**Gear / Fleet scale**[5] Consult the list "**Gear / Fleet scale**"

[6] Consider to NOT EXCLUDE, if this work is absolutely relevant to the context of WP2. To ensure this, the review items were further evaluated by the T2.1 Lead. Theoretical (non-empirical) studies were considered for inclusion, if they were judged extremely relevant to T2.1

[7] The focus is on social and/or economic indicators/models/tools that can be used to predict the impact of management strategies

[8] Relevant to Task 2.2. Useful terms to look for: FLBEIA, BEMTOOL, Data Envelopment Analysis (DEA), Stochastic Frontier Analysis (SFA), SWOT, etc.

[9] Relevant for Task 2.3 on how social processes affect fisheries and how fisheries affect social systems.

[10] Relevant for Task 2.4 on effective and socially acceptable fisheries governance and management measures

[11] Relevant for Task 2.5 on human health benefits of eating different types of fish

Overall, *screener 1* and *screener 2* disagreed in 193 cases out of 1,087, which implies a level of disagreement of approximately 17.8%. After the review by the super-screener, 233 papers were retained as relevant for data extraction (Table 2). The cause of exclusion can be seen in Table 3.

Table 2. Super-screener decision to Include/Exclude papers for the data extraction phase

Super-screener decision	Number of papers
Exclude	854
Include	233
Grand total	**1087**

Table 3 Allocation of reasons for Exclusion in the Screening phase, based on Title, Abstract and Keywords

Decision to Include / Exclude	Number of Papers
Exclude	**854**
Year	372
Evid	259
Loc	82
Ecos	56
Targ	55
Lang	15
Type	10
Temp	5
Include	**233**
Grand Total	**1087**

Full-Text Exclusions

During the data extraction phase, where the whole paper was read, 46 additional articles were excluded, using the same criteria as in the screening phase. The causes of exclusion at this level are seen in Table 4.

Table 4 Allocation of reasons for Exclusion in the Data Extraction phase, based on full-text reading

Decision to Include / Exclude Data extraction phase	Number of Papers
Evid	23
Lang	1
Loc	3
Targ	4
Type	15
Grand Total	**46**

4.4 Data extraction

The data extraction file for each participant contained the list of papers to be reviewed and columns to complete, divided into three areas.

The **first area** was about bibliographic data and was pre-filled by the person in charge of task 2.1. The **second area** was common elements across all x.1 Tasks and the third area was WP2-specific. The common area was about capturing information for the study under review, the scope of the analysis in terms of both *space* and *time*, the *sampling method*, the *inference method*, and a qualitative evaluation from the reviewers, with regards

to the methods used in the paper for the space and time covered. At each column's heading, there was a comment with instructions from the coordinator of systematic reviews, to the reviewers.

The **third area** was asking for WP2-related information: name of the specific ***Fisheries, Management policy***, ***policy objective***, ***type of impact*** (economic, social, Environmental), ***direction of the impact*** (positive, negative, neutral), ***scale of the impact*** (local, regional, global), ***socio-economic model or indicator*** used to evaluate the impact, ***quantitative*** and ***qualitative*** variables used in the model or index as input, type of ***Fishing Gear*** examined by the paper, as well as the ***Fleet scale*** concerned. At each column's heading, there was a comment with instructions from the Task 2.1 lead, to the reviewers.

For the classification of WP2-specific columns, initial feedback was requested from 2-3 volunteer experts who made a trial use of the first version and provided ideas for improvement. The final table contains all the fields of the data extraction template, along with the instructions given to the reviewers (Table 5).

The outcomes of the database searches, as well as the inclusion/exclusion of papers during the screening and data extraction stages, are summarized graphically in Figure 4.1.

Table 5 Data extraction fields for T2.1

Bibliographic Data	**SW ID** **SearchID** **Authors** **Title** **Year** **Source title** **Volume** **Issue** **Page start** **Page end** **DOI** **Link** **Abstract** **Language** **Document Type** **Open Access** **Database**	Bibliographic Information comes pre-filled.
Common	**Exclusion Criteria**	If the information in the full article matches one of the screening criteria, here is where you match them. If excluded, DO NOT PROGRESS with extractions. Please see tab "Exclusion Criteria" for the code to be selected
	Region	If the study is within a SEAwise CS domain (see supp. Mat.) use the categories starting with "CS", Otherwise use the lowest resolution from the other categories.
	Scale - Spatial (m)	Utilise either the scale on the map of the study area or an estimation based on a google-maps "measure-distance", to determine the greatest extent of the study. Use "as the fish swims" meaning straightest lines that do not cross water.
	Scale - Temporal	Field observations: What is the time between the first and last observations used? Use the category below the duration (e.g. 7 year study = 5-year category. Experiments: Duration of the manipulation. Simulation studies: length of timeseries used to validate (NOT the "spin-up time").
	Resolution - Spatial (m)	ESTIMATION of the median distance between observations. Don't invest too much time in accuracy. Use the same methods as for spatial scale.
	Resolution - Temporal	Estimated median time interval between repeated observations.
	Sampling Method used for data collection	Categorise the types of physical data collection that were utilised to observe the response variable.
	Analytical method used for inference	Free text field to NAME the statistical/analytical method used to draw inference. E.g. BACI, GAM, EwE, Integrated Trend Analysis, DEB model, Linear Regressions, etc. etc… Try to keep responses consistent. E.g. keep spelling consisitent.
	Quality - Spatial (relative 1-3)	Does the spatial coverage and resolution match the claims being made? E.g.: 3 - Scale is larger than claim and resolution is sufficient, OR Resolution is finer than processes being described and claims aren't generalised greater than scale. 2 - Scale and resolution appear sufficient to support claims 1 - Claims are extended far beyond scale of sampling OR resolution isn't suffiicient to capture proposed processes.

	Quality - Temporal	Does the temporal coverage and resolution match the claims being made? E.g.: 3 - Time series extends beyond the trends being described in at least one direction and resolution is finer than processes being described (e.g. annual trends desribed with seasonal resolution). 2 - Scale and resolution appear sufficient to support claims (time series captures only recent trend) and/or sampling resolution is on scale of claims. 1 - Claims are extended far beyond scale of sampling (e.g. predicted responses to temperature increases outside of observations) OR resolution isn't suffiicient to capture proposed processes (e.g. claims of seasonal patterns with sampling only once per year).
	Quality - Methods	Judgement of how well analytical methods match the data and support the inference. E.g.: 3 - methods suitable for the data and output interpreted correctly. 2 - Doubt about suitability of the methods (e.g. linear methods for a likely non-linear relationship) OR claims of effects where method cannot disentangle multiple effects. 1 - Analytical method clearly not suitable for data or claims not supported by results (e.g. data-mining, multiple tests undertaken without p-threshold corrections OR model variables without justification for inclusion/exclusion OR claims of relationships where no statistical significance exists OR misinterpretation of effects in models).
	Concluding statement or quotable quote	Voluntary field, if the author(s) have a nice summary quote or interpretation that might be useful for broader trends.
	Comments	Free text - voluntary. Treat this as a personal comment section - count on no one else reading it but you.
WP2-specific	**Management Policy**	Here you need to indicate the Manamegement Policy considered in the paper. Choose an option from the drop-down list. You can find some explanations for each typoe of Policy in tab "Glossary-Fishery Policies". In case of "other", you need to specify in the next column.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Objective of Management Policy	Choose the primary objective of a Management Policy from the drop-down list, if specified. In case of "other", please specify in the next column.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Type of impact	Choose the type of Impact that a Management Policy has, if specified in the paper.
	Impact direction	Here you need to specify the direction of the impact, if this information is derived from the study. Choose an option from the drop-down list.
	Impact Scale	Specify the scale of the impact of a Management Policy, if this information is derived from the study, by picking an option from the drop-down list.
	Model/Tool used	From the drop-down list, choose the model or tool used in the study for the assessment of the socio-economic aspects of a Management Policy. In case of other, please specify in the next column. If more than one models/tools are used, add more lines.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Quantitative variables	From the drop-down list, select all the quantitative variables used for social or economic assessment of a fishery's practice, through a model/tool/indicator. The list includes both social and economic variables. If more than one variable add a line. In case of many variables (e.g. > 5), you can insert them all in the same cell in the next column, using " _ " as a separator. In case of other, please specify in the next column.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Qualitative variables	From the drop-down list, select all the qualitative variables used for social or economic assessment of a fishery's practice, through a model/tool/indicator. The list includes social, economic, environmental, health and governance variables. In case of other, please specify in the next column. If more than one variable add a line. If there are many variables (e.g. >5), you can insert them all in the same cell in the next column, using " _ " as a separator.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Type of Gear	Choose from the drop-down list. In the case of others, please specify in the next column. For multiple options use next column, using " _ " as a separator.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.
	Fleet Scale/Type	Choose from the drop-down list. In case of other, please specify in the next column. For multiple options use next column, using " _ " as a separator.
	In case of other, please specify:	You can add as many options as you want in the same cell, using " _ " (space, underscore, space) as separator.

The outcomes of the Database searches, as well as the Inclusion/Exclusion of papers during the Screening and Data Extraction stages, are summarized graphically in **Figure 4-1**.

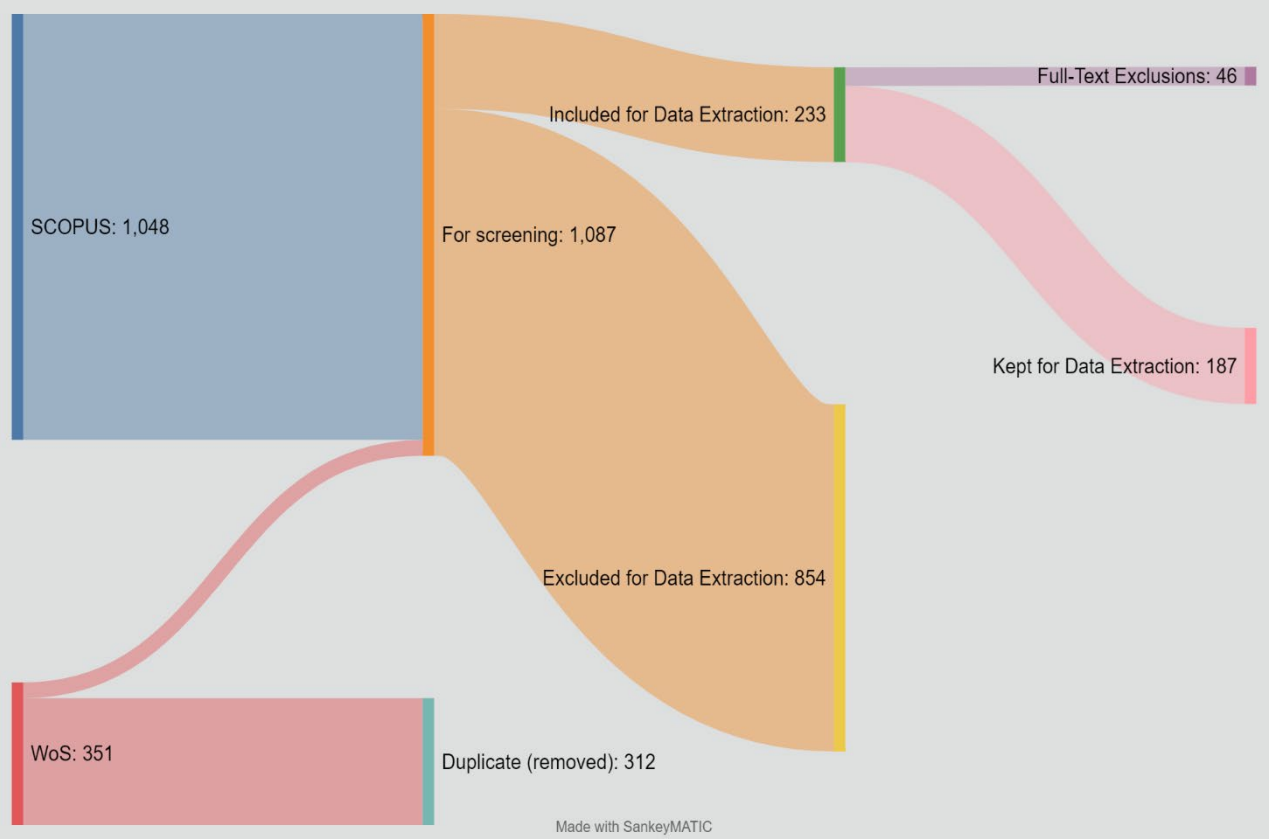


Figure 4-1 Sankey diagram with the outcomes of the Search, Screening and Data Extraction stages

4.5 Description of the database produced

Temporal resolution

There was approximately even distribution of the number of documents per year from 2013 onwards (**Figure 4 4-2**). The majority of studies use data for at least five years (**Figure 4.4-3**) and used annual data in the analyses (**Figure 4.4-4**). As for the temporal scale, this is depicted in **Figure 4.4-5** for the different regions.

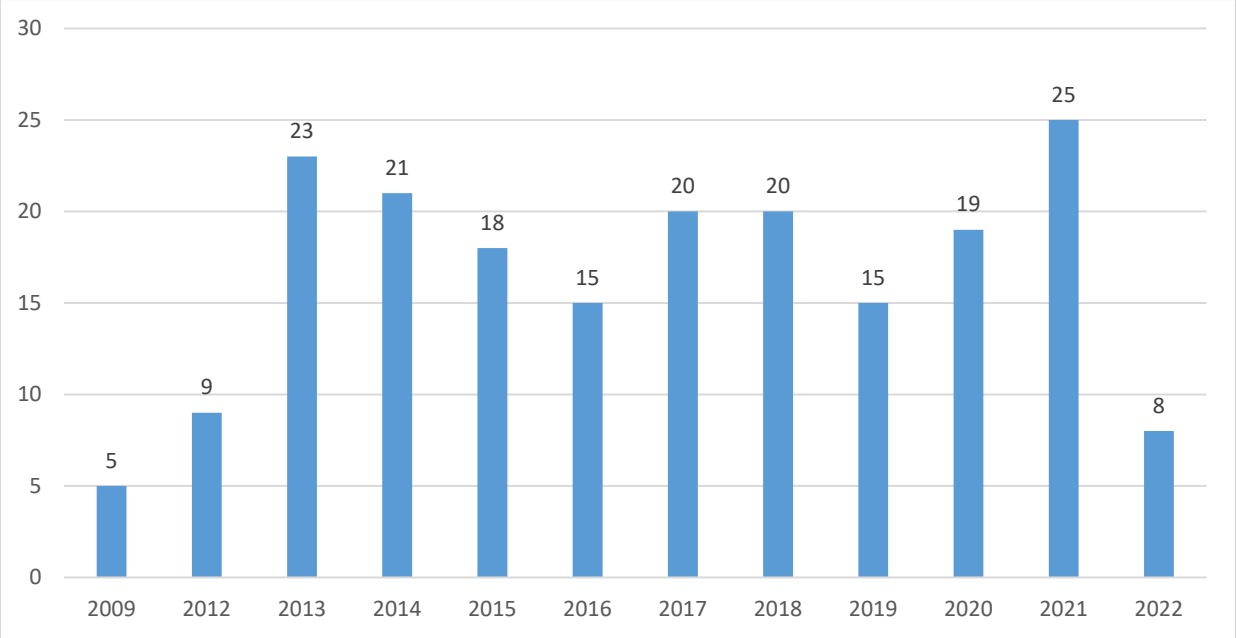


Figure 4 4-2 Studies per year of publication.

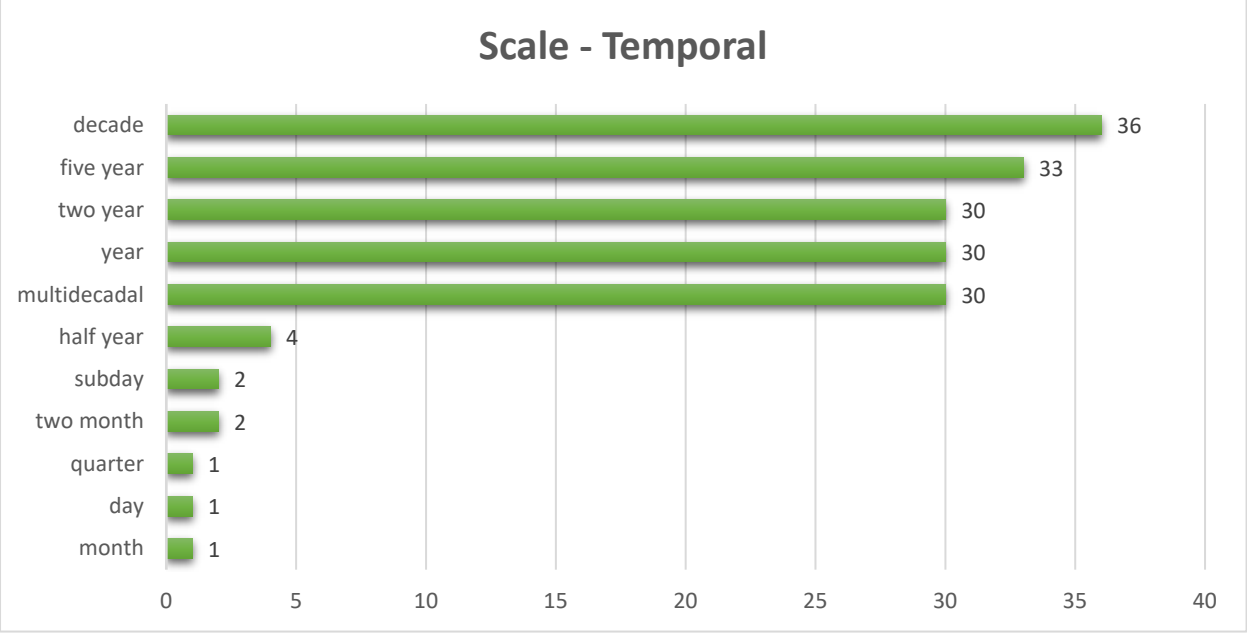


Figure 4.4-3 Number of studies per temporal scale.

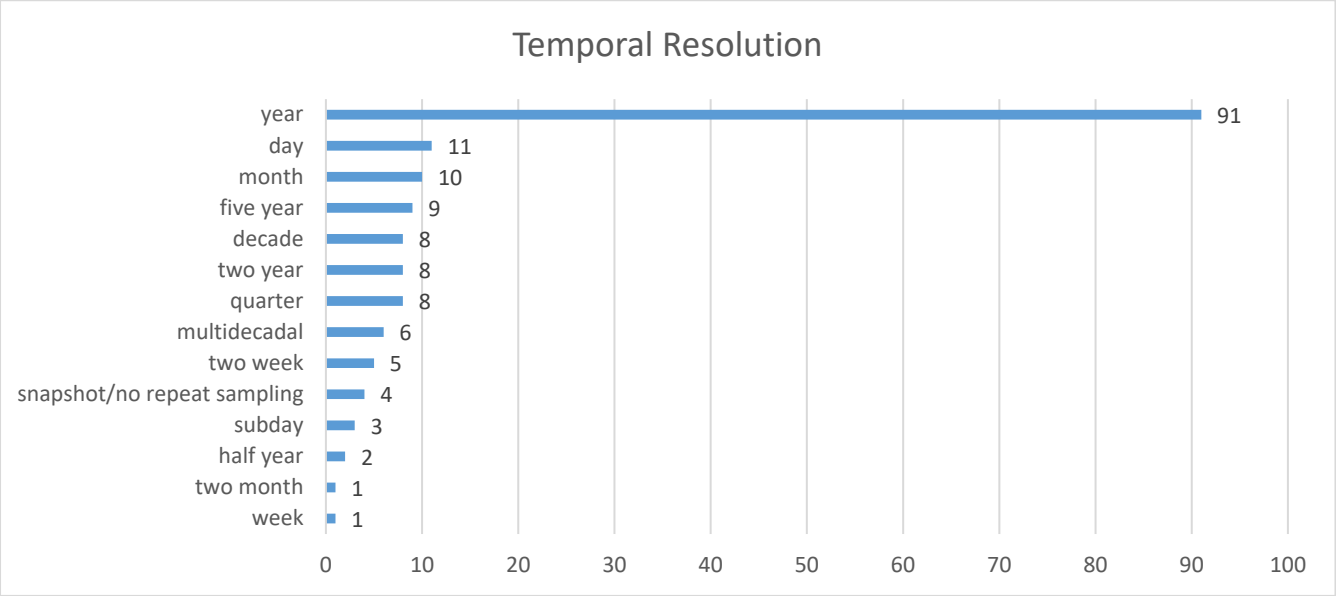


Figure 4.4-4 Number of studies per observation frequency.

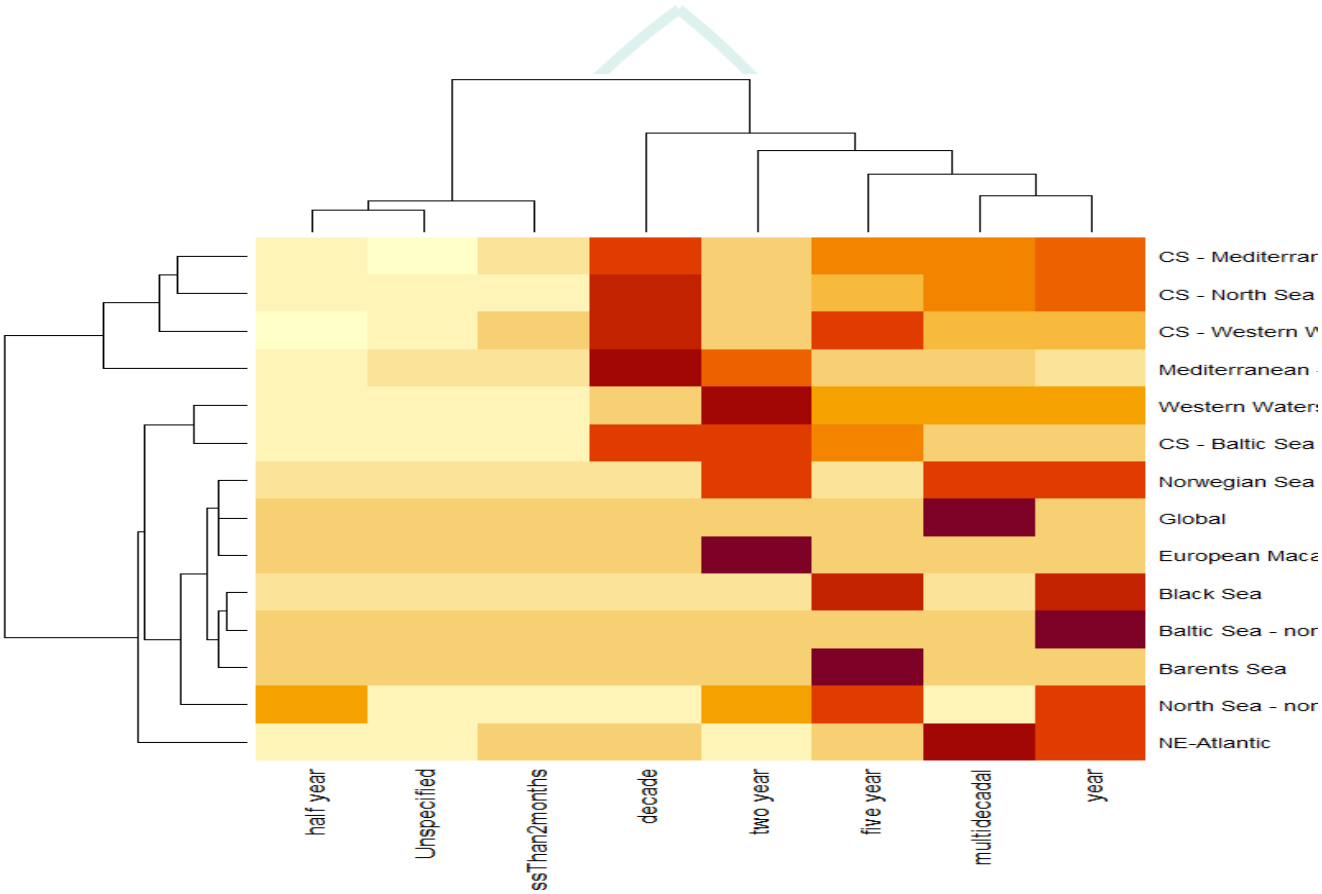


Figure 4.4-5 Clustering of temporal scale over regions.

Case Study and spatial scale

More than 30% of the papers retained concerned the Mediterranean region, followed by Western Waters, the North Sea and Baltic Sea (**Figure 4.4-6** and **Figure 4 4-7**). **Figure 4.4-8** depicts the allocation of papers and whether the documents concerned the areas of interest of Case Studies or not, and **Figure 4.4-9** depicts the spatial scale over regions.

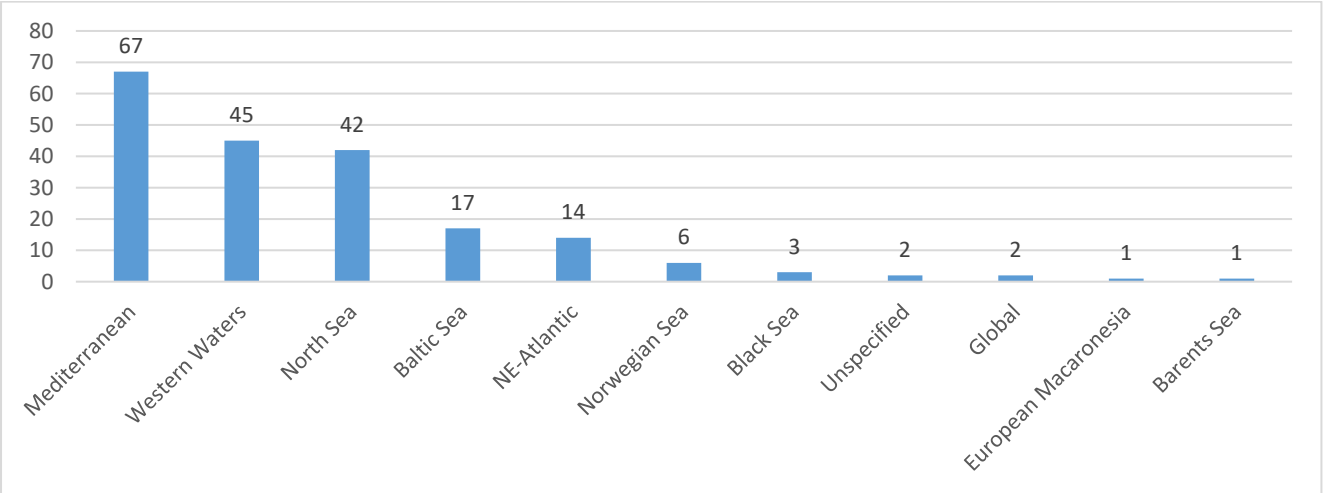


Figure 4.4-6 Total studies per region (including both CS and non-CS areas).

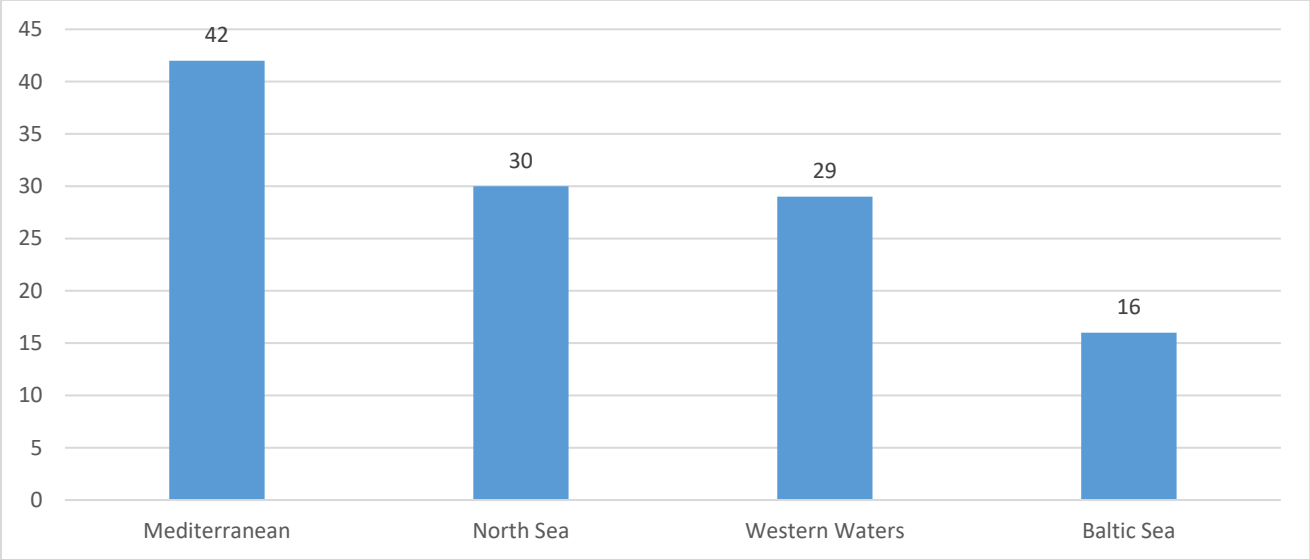


Figure 4 4-7 Total studies per region (only CS areas).

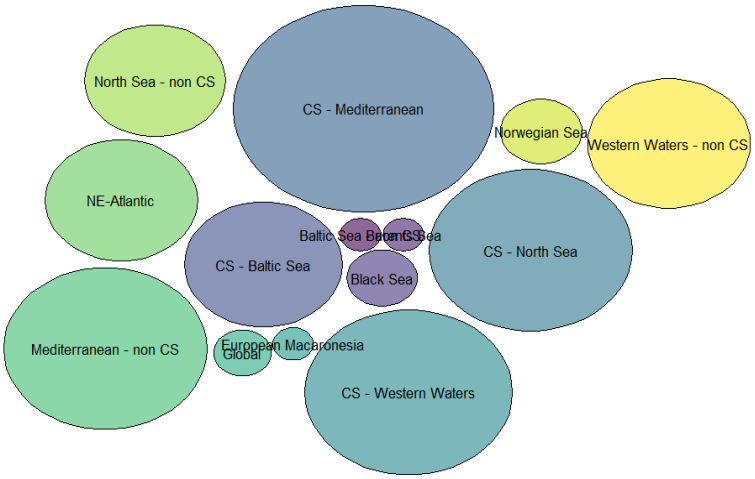


Figure 4.4-8 Allocation of studies based on Study Region.

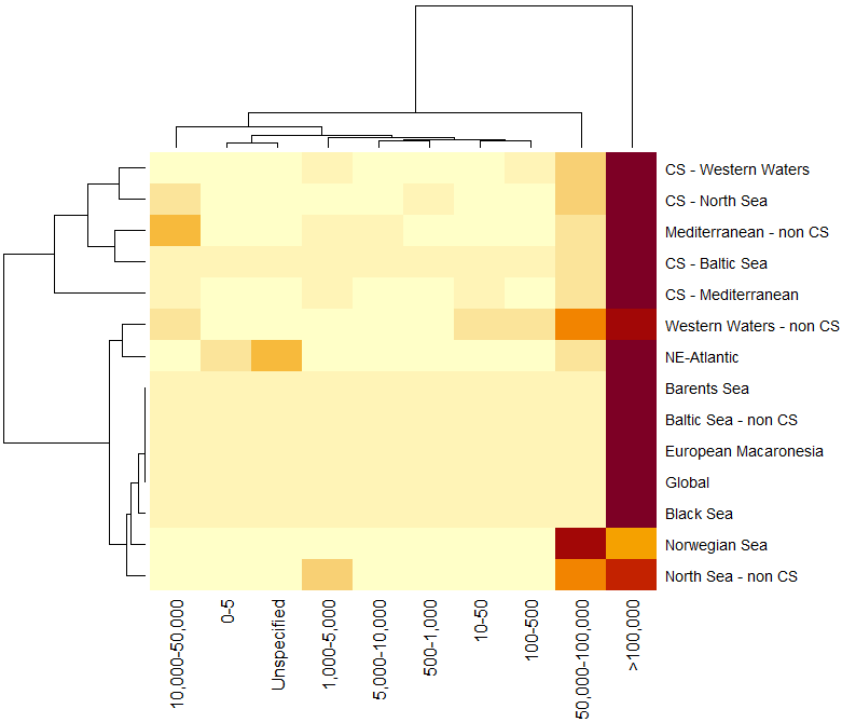


Figure 4.4-9 Clustering of Spatial scale over regions.

Fleet scale

Most articles did not specify the category of the fleet, but among those that did, small- and large-scale fleets were approximately equally represented. A large number of papers examined various types of fleet scales.

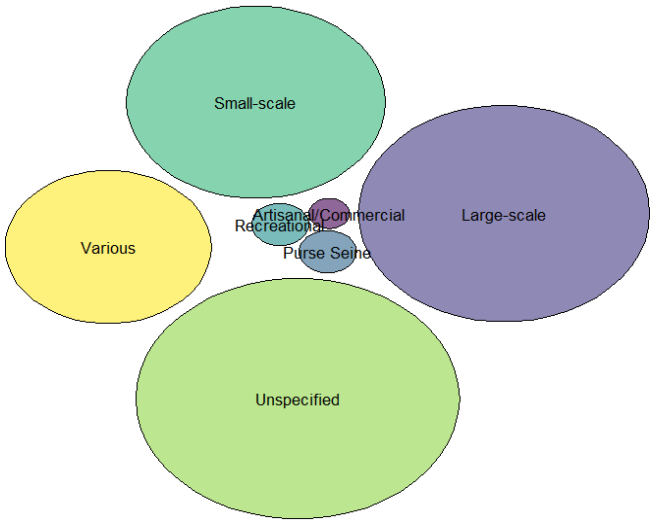


Figure 4.4-10 Allocation of studies based on fleet scale.

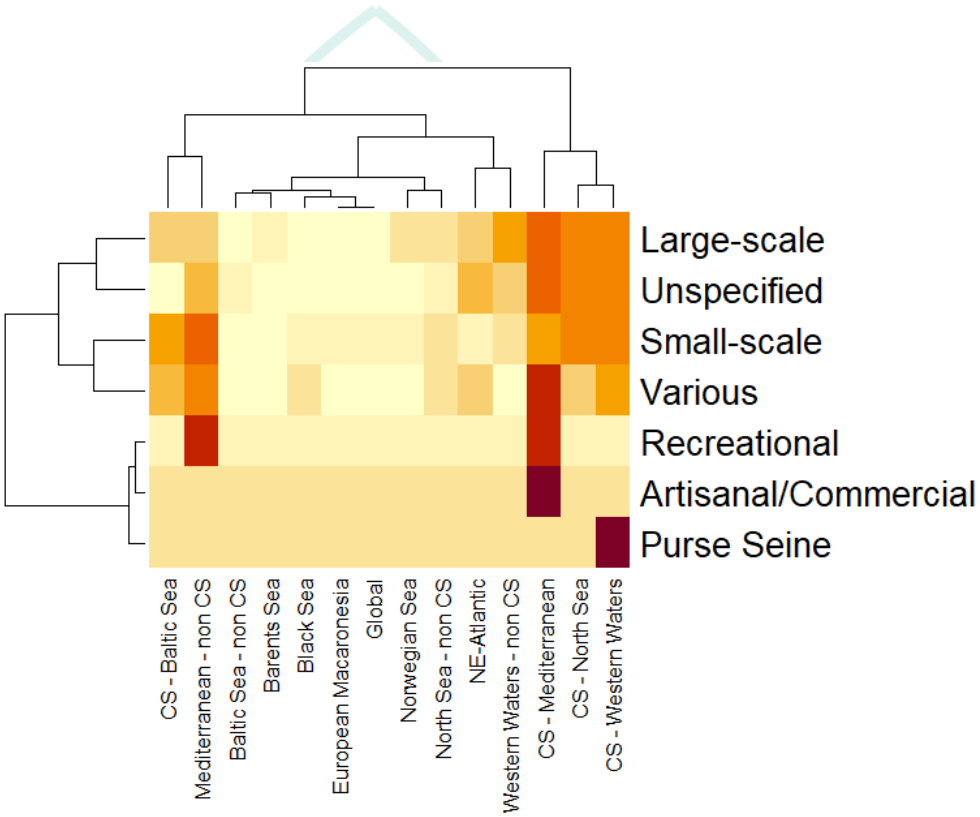


Figure 4.4-11 Hierarchical clustering of fleet-scale per region.

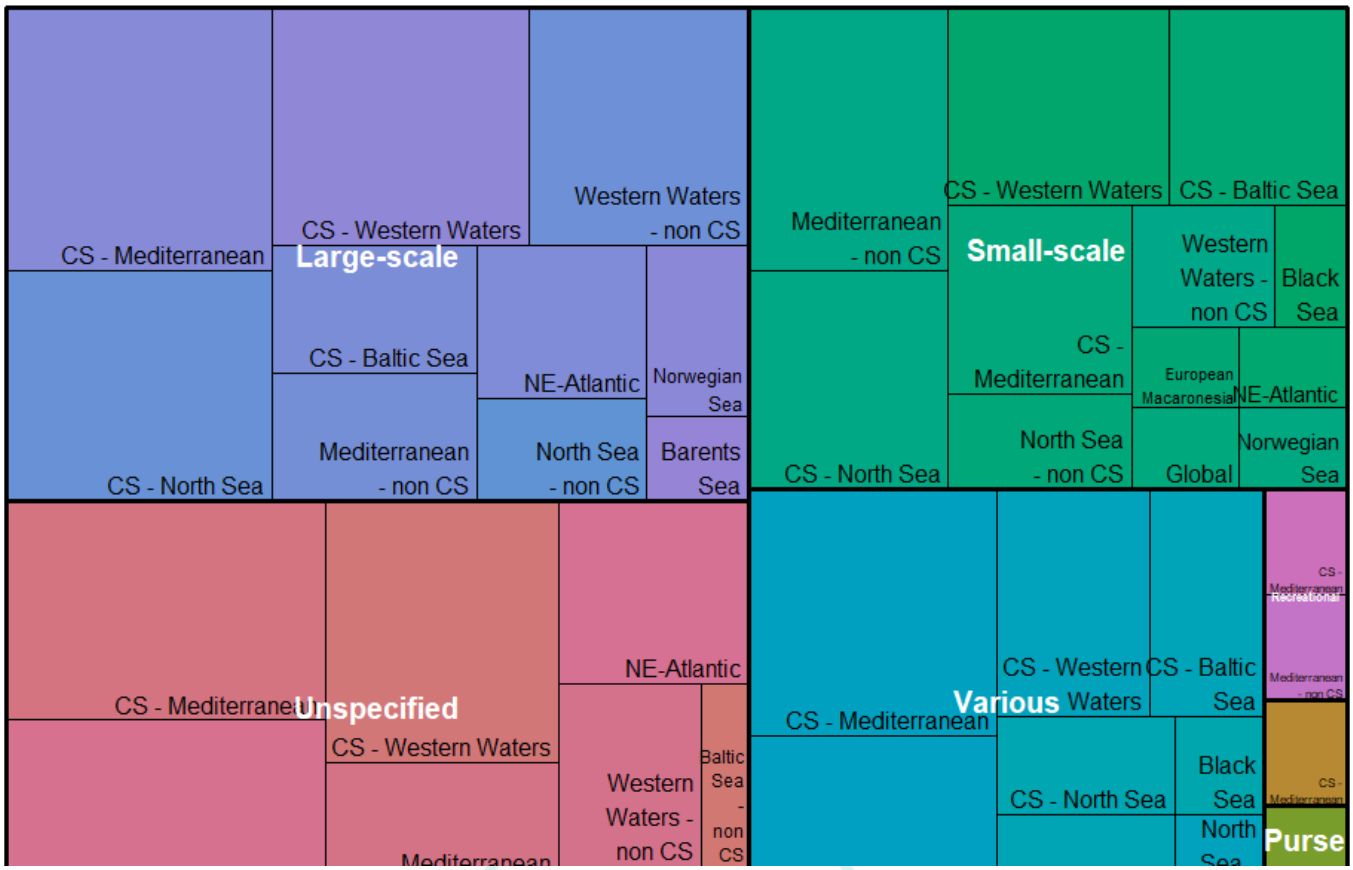


Figure 4.4-12 Treemap of fleet-scale over regions

Type of gear

Trawl was dominating gear type in the papers followed by unspecified gear, gillnets and seine (Figures 4.13, 4.14 and 4.15).

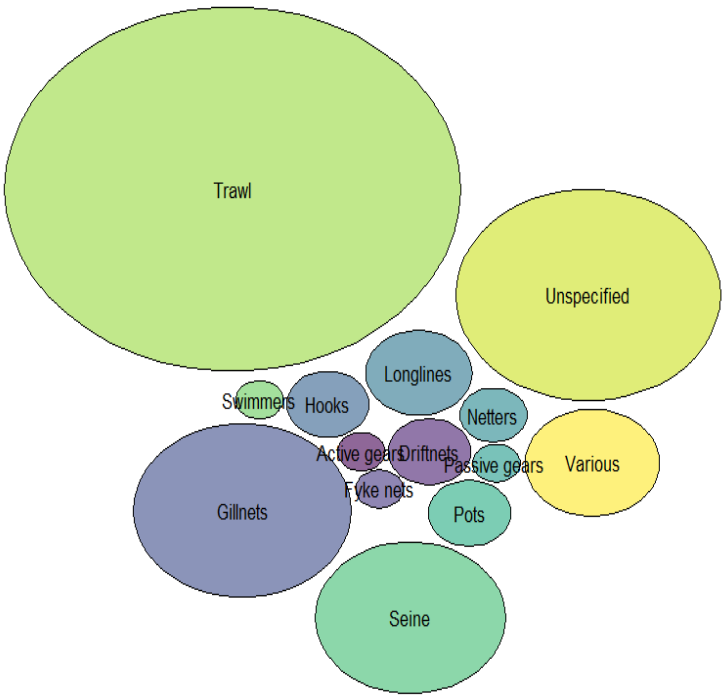


Figure 4.4-13. Allocation of studies based on type of gear.

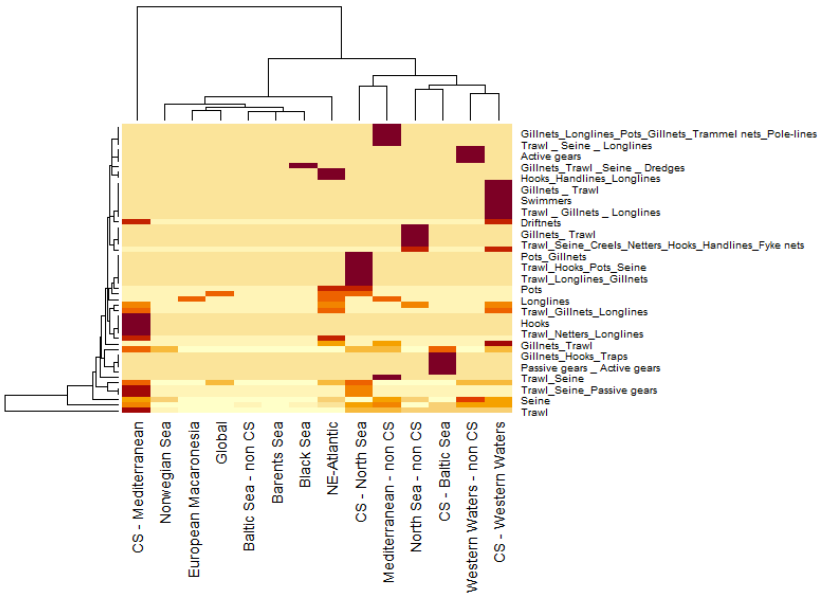


Figure 4.4-14 Hierarchical clustering of Gear Type per Region

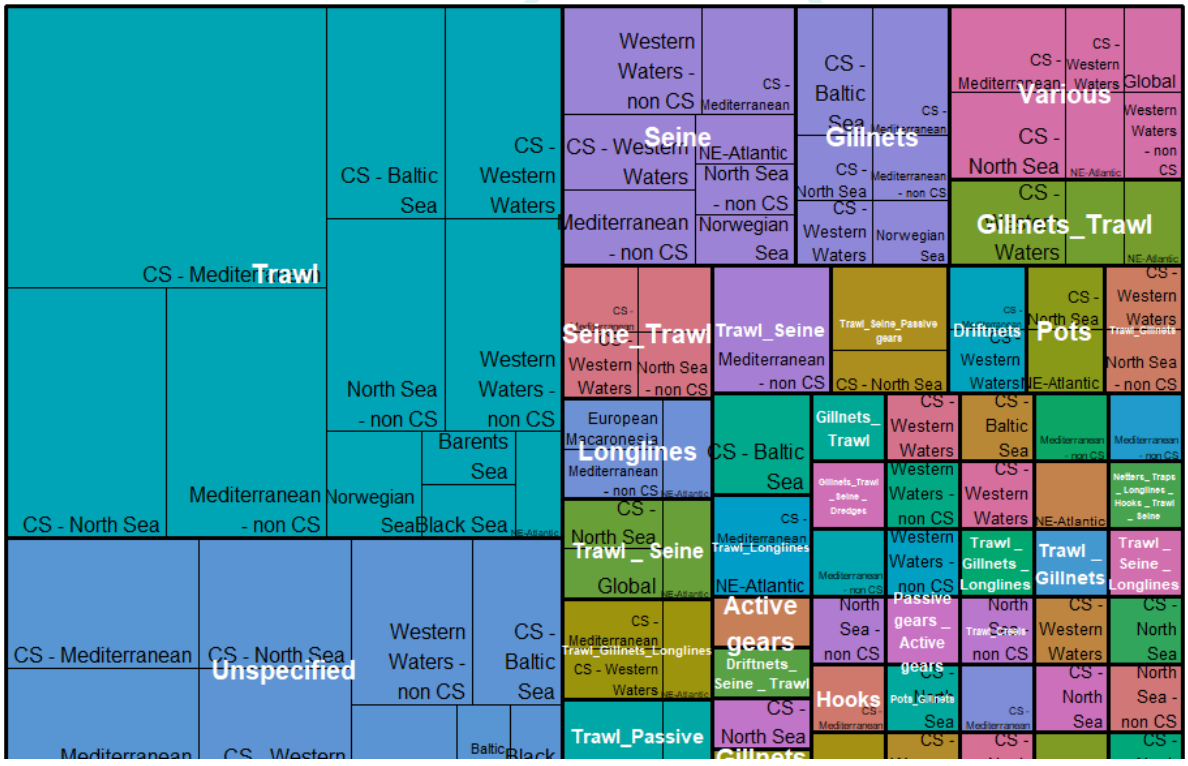


Figure 4.4-15 Treemap of Gears over regions

Quality assessment (spatial-temporal-methods used)

Participants in the data extraction assessed whether the spatial coverage and resolution match the claims made in the paper using a 3-scale scoring:

1. Claims are extended far beyond the scale of sampling OR resolution isn't sufficient to capture proposed processes;
2. Scale and resolution appear adequate to support claims;
3. Scale is larger than claim and resolution is sufficient, OR Resolution is more acceptable than processes being described and claims aren't generalised greater than scale;

The resulting scoring can be seen in Figure 4.16 and 4.17.

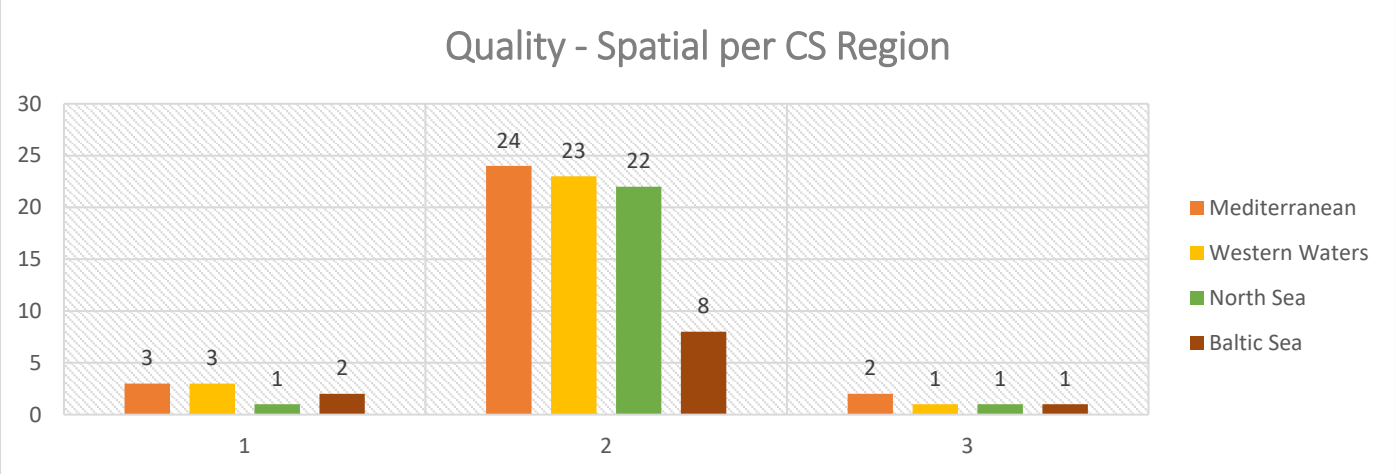


Figure 4.4-16 Quality - spatial per CS Region

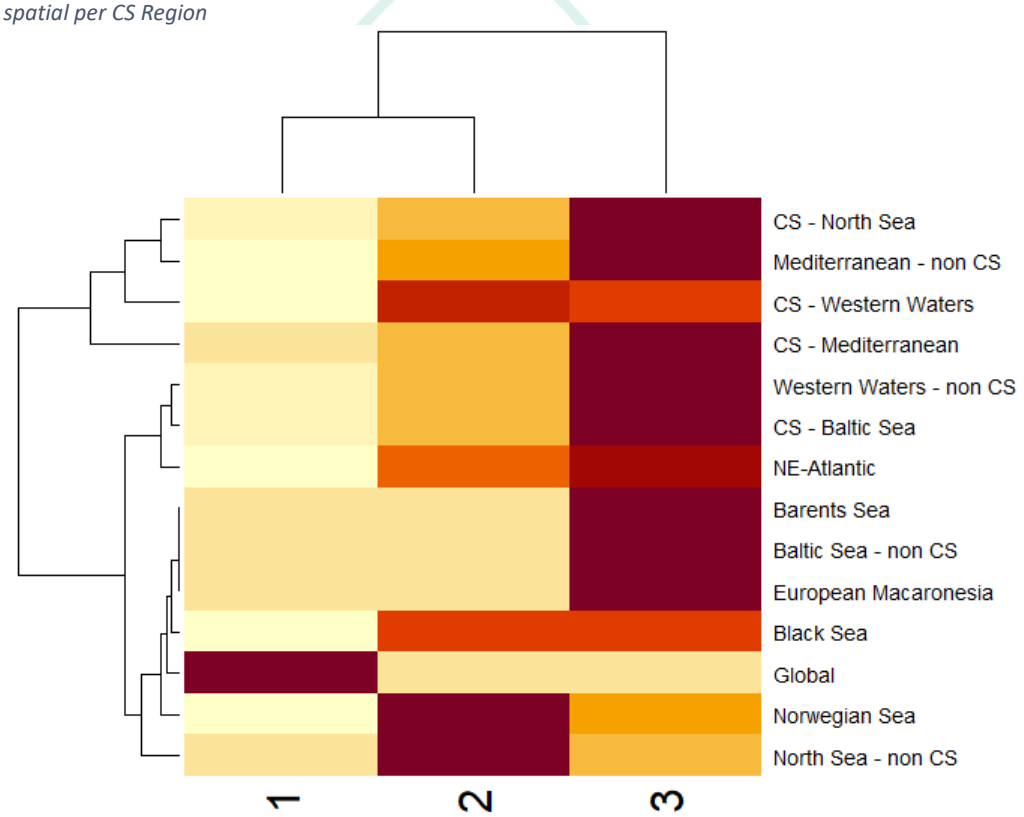


Figure 4.4-17 Hierarchical clustering of methods quality per region

In the assessment of whether the temporal coverage and resolution match the claims made in the paper, a slightly different 3-scale scoring was used:

1. Claims are extended far beyond the scale of sampling (e.g. predicted responses to temperature increases outside of observations) OR resolution isn't sufficient to capture proposed processes (e.g. claims of seasonal patterns with sampling only once per year).
2. Scale and resolution appear sufficient to support claims (time series captures only recent trends) and/or sampling resolution is on the scale of claims.
3. Time series extend beyond the trends being described in at least one direction and resolution is finer than the processes being described (e.g. annual trends described with seasonal resolution).

The resulting classification can be seen in Figure 4.18 and 4.19.

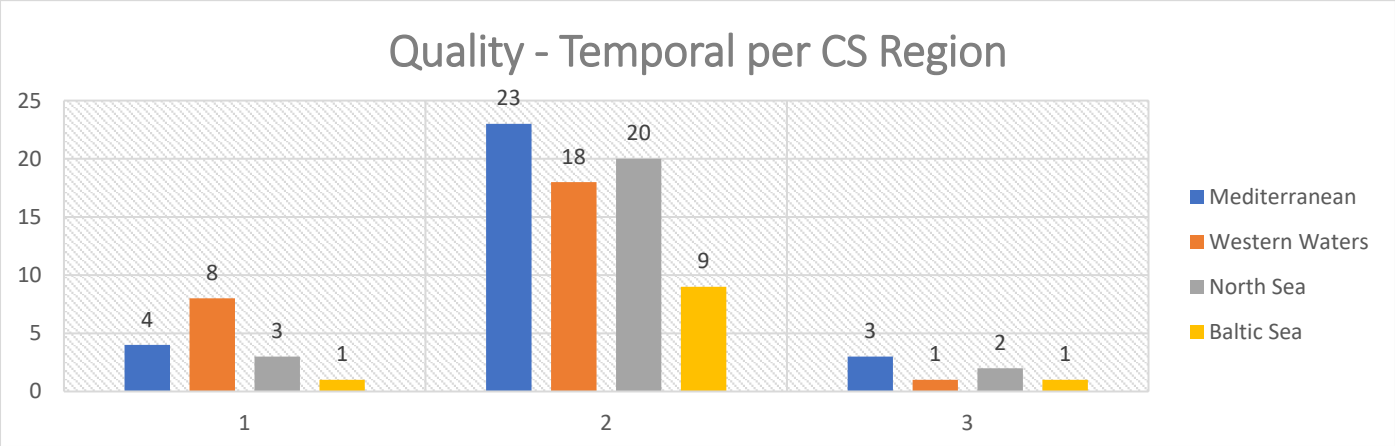


Figure 4.4-18 Quality - temporal per CS Region

Finally, the match between the data and methods supporting the inference in the paper was scored using the 3-scale:

1. The analytical method is not suitable for data or claims not supported by results (e.g. data-mining, multiple tests undertaken without p-threshold corrections OR model variables without justification for inclusion/exclusion OR claims of relationships where no statistical significance exists OR misinterpretation of effects in models).
2. Doubt about the suitability of the methods (e.g. linear methods for a likely non-linear relationship) OR claims of effects where the method cannot disentangle multiple effects.
3. Methods suitable for the data and output interpreted correctly.

The resulting classification can be seen in Figures 4.19.

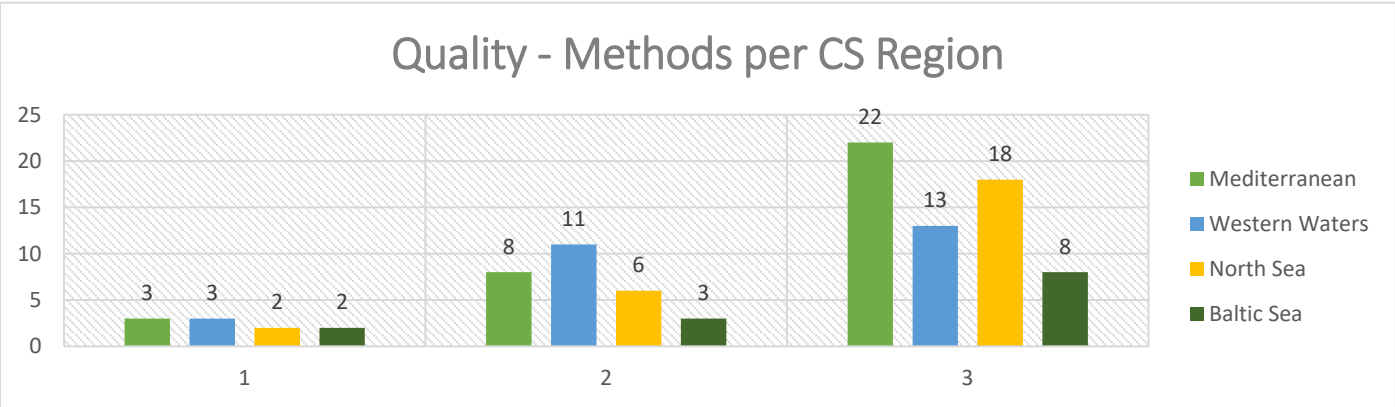


Figure 4.4-19 Quality - methods per CS Region

4.6 Subject Coverage

Fisheries management policies

In the next two graphs, we present the Fisheries Policies that were examined in the papers that we reviewed inside (Figure 4.20 and 4.22) and outside the CS areas (Figure 4.21 and 4.23).

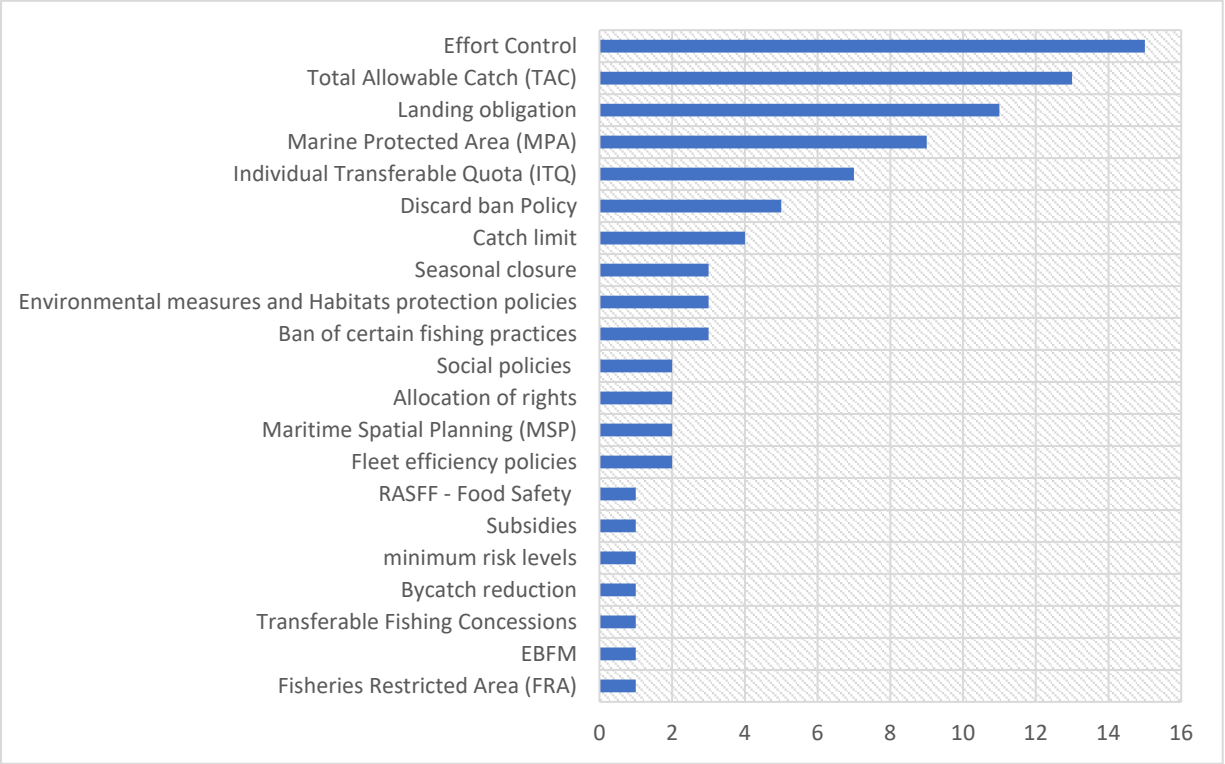


Figure 4.4-20 Fisheries Management policies in the Case Studies areas:

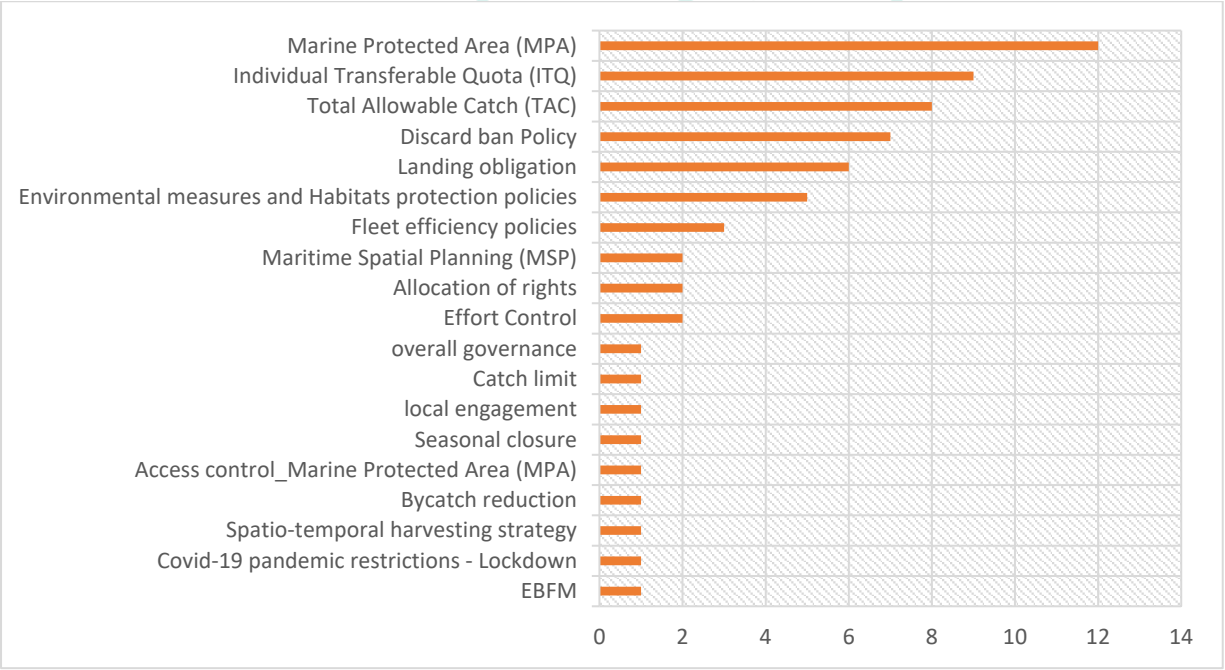


Figure 4.4-21 Fisheries Management policies outside the Case Studies areas

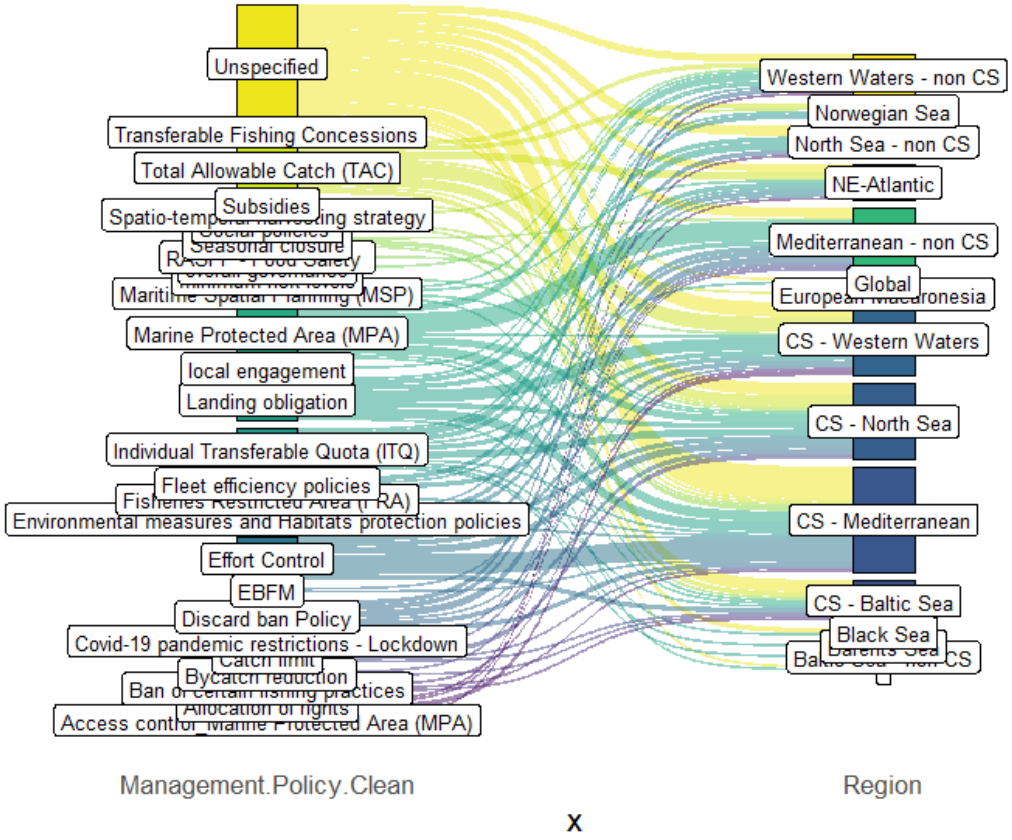


Figure 4.4-22 Mapping of Management Policies to regions

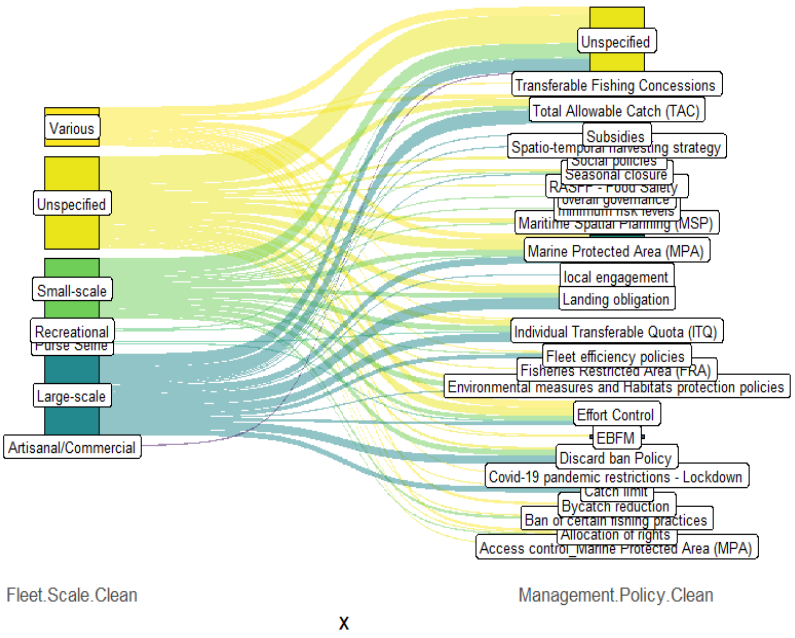


Figure 4.4-23 Mapping of Fleet Scale to Management Policies

Models

The models identified that for the assessment of the Economic, Social and/or environmental impact of fisheries are listed in **Table 6**.

Table 6 List of all models for the assessment of Economic, Social and/or environmental impact of fisheries

Model Used	Number of cases
Bioeconomic modelling (BEMCOM, BEMTOOL, FLBEIA, MEFISTO, FISHRENT, Impact Assessment Models (IAMS), SMART, EFIMAS)	35
Indicators analysis	19
Generalized Linear Models	16
Lit Review - Questionnaires - Surveys	16
Multi-Criteria Decision Analysis	6
Ecopath	6
Regression analysis	4
Logit	4
Time series	3
Bayesian Belief Networks (BBN)	3
Linear - NonLinear Programming	2
Dynamic-state variable model	2
ANOVA / PERMANOVA	2
Stochastic Analysis	2
Exploratory data analysis	2
Positive Mathematical Programming (PMP)	2
Principal Component Analysis (PCA)	2
LCA of the supply chain	2
Cost Benefit Analysis (CBA)	2
Static Equilibrium model	1
rule-based fuzzy cognitive map framework	1
Productiviy susceptanbiity analysis (PSA)	1
High-resolution mapping	1
social-ecological vulnerability framework	1
Data Envelopment Analysis (DEA)	1
Price flexibility (RIDS model)	1
Input-Output	1
REA and assessements criteria	1
InVEST model	1
SELNET	1
ARIMAX model	1
spawning stock biomass / recruitment (SSB/R) Beverton and Holt model	1
decision tree	1
GOA model	1
Gadget modelling framework	1
Gordon-Schaefer model	1
Theil index	1
Random Utility Model	1
GAM_GEE	1
Cobb Douglas production technology	1
Ascending Hierarchical Classification	1
RUM approach	1
Model of Intermedi-ate Complexity for Ecosystem assessments	1
Simulations_multispecies size-structured fish community models	1
CLARA	1
spatiotemporal distribution of fishing effort	1
Network analysis	1
SPiCT (population model, combined with on fleet models and objective function	1
optimisation of an objective function	1
HHI, GINI, Lorenz-curve	1
Population Viability Analysis _ Economic Viability Approach _ Co-Viability Approach	1
mapping	1
Bayesian Network Modelling (Netica)	1
Logit _ Probit _ Gombertz _ Richard	1

Indicators identified

The economic, social and environmental indicators identified in the studies are listed in Table 7.

Table 7 Economic, Social and Environmental Indicators for Fisheries

Economic	Social	Environmental
Continental Shelf Area vs Total Annual Landings	Catch for different fleet segments under management scenarios	Total ecosystem biomass (t/km2)
N. vessels/Km2	Number of jobs created for full by-catch utilization by gender	Total Ecosystem Catches including discards (t/km2/year)
N. trawlers/Km2	New fish processing plants	PPR%: ratio of primary production required to sustain fisheries to PP
Break-even	Resident and reproducing marine fish	mTLc: mean trophic level of the catch
Opportunity cost		GE: Gross efficiency (landings/PP)
Catch per unit of effort (CPUE)		L index: Loss in the secondary production index
The intensity of the coastal fleet's participation in winter fishery		Psust: Probability to be sustainably fished
Consumption		Age-structures population model based on Baranovs catch equation
Taxes per product		By commercial catch category and age group
Mixed-Income		By-catch rate
Contribution of Landings to GDP		Environmental cost-effectiveness analysis
Exportation/Importation		Weighted Mean Trophic Level Index
Economic return = landings (value)-costs		Mean weighted Intricis Vulnerability Index
Energy ratio = fule energy/landings energy		Persistent organic pollutants
Landings per unit effort (lpue) (kg per h fished per vessel per trip per area)		Heavy metals
Mean Catch/day/fisher		Presence of sensitive species
Mean weighted Economic Value		Diversity of by-catch species
Mean ratios of landing values		The population size of the target species
The ratio of revenues to break even revenue		The ratio of species' low-high resistance to a fishing-discarded fraction
Yield per recruit analysis		The proportion of target species larger than the mean size at first sexual maturation
Price per age of fish		95th percentile of the fish length distribution of each target species
Turn-over by vessel and by a crew member (in k€ vessel-1 crew-1)		Productivity of trophic guilds
Turn-over by vessel and by fish trip (in k€ vessel-1 10 h-1)		The proportion of large-bodied organisms (top of food webs) in the catch
Landing by vessel		The abundance of functionally important trophic groups
Landing by crew		Production for human consumption
Landing by a fishing trip		Production for non-human consumption

Quantitative economic, social and environmental variables

The quantitative variables used in models or indicators to assess the socio-economic impact of fisheries policies in the reviewed items are listed in Table 8. The most important in terms of frequency of use are landing volume, effort (fishing days) and landing value (Figure 4.24).

Table 8 Quantitative Variables Identified in T2.1

- Average capacity per vessel
- Average Investments per vessel
- Bycatch (volume)
- Capital costs
- Capital value of unit effort (CapPUE)
- Cash flow (gross)
- Catch (size)
- Catch (volume)
- Consumption
- Continental shelf surface
- Cost of Ice
- Cost of sales
- Cost per unit of fishing effort (CPUE)
- Costs (depreciation)
- Costs (fixed)
- Costs (operational)
- Costs (other)
- Costs (provision)
- Costs (repair & maintenance)
- Costs (total)
- Costs (variable)
- Discards
- Earnings Before Interest and Taxes (EBIT)
- Employment on board (crew)
- Engine power
- Escape probability
- Estimated vessel value
- Family members
- Fish price
- Fishers age
- Fishing capacity (Gross Tonnage)
- Fishing Effort (days at sea)
- Fishing gear material
- Fuel costs
- Gross Operating Surplus (GOS)
- Gross profit
- Gross tonnage
- Indirect output value
- Initial Abundance
- Labor cost
- Landing probability
- Landings (value)
- Landings (volume)
- Landings per unit Effort
- Length of the fleet
- Maximum Sustainable Yield (MSY)
- Mean individual weight
- Number of vessels
- Profit (gross)
- Profit (net)
- Profit (operating)
- Quota allocation
- Return on Fixed Tangible Assets
- Return on investment
- Revenues (total)
- Revenues per unit of effort (RPUE)
- Sea Surface Salinity (SSS)
- Sea Surface Temperature (SST)
- Seasonal sea ice extent
- Social contributions
- Socio-economic data
- Spawning stock biomass (SSB)
- Taxation
- Total Investment
- Total surface of nursery area
- Turnover
- Unspecified
- Value Added (gross)
- Value Added (net)

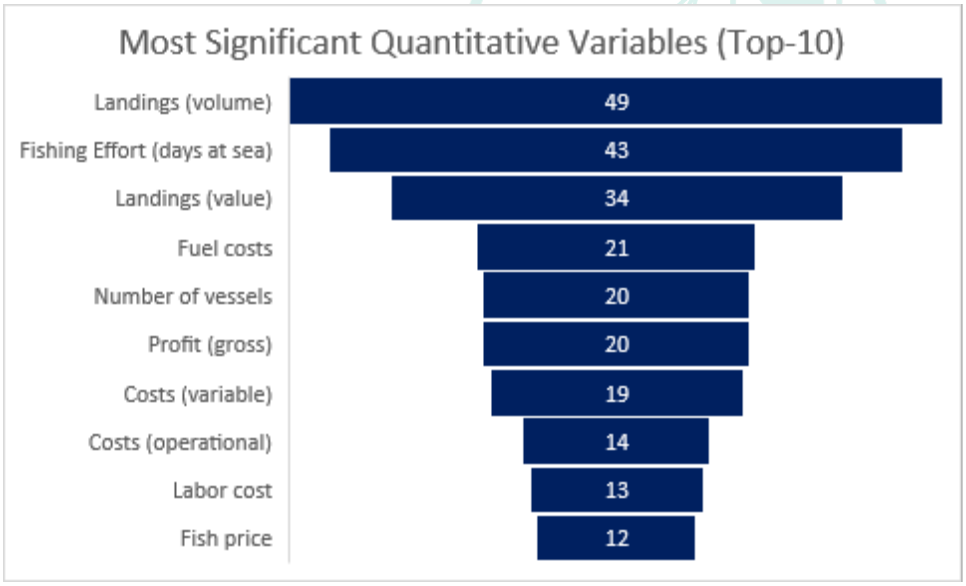


Figure 4.4-24 Most Significant Quantitative Variables (Top-10) in all regions

Qualitative economic, social and environmental variables

In addition to the purely quantitative variables used in the models mentioned above, many studies also referred to variables with qualitative or categorical characteristics, such as level of education, various biological factors, level of fishing mortality etc. Such qualitative and/or categorical variables considered in the papers for the assessment of the socio-economic impact of fisheries policies are listed in **Table 9** .The most frequently mentioned were economic performance, sustainability-resilience and compliance (Figure 4.25).

Table 9 Qualitative Variables Identified

Adaptive Capacity	Economic Performance	Health (public)	population dynamics	Stock Protection
Age class of stock	Economic viability	Heavy metals	presence and extent of nursery areas for target species	Stomach content
Biological factors	Education level	Immigration rate	Presence-absence of the ENGO effect	Survival probabilities of discard
Biomarkers concentration	Effort	independency	Prey preference probability	Sustainability-Resilience
Biomass	Employment	kinship relations within Texel fishing community in relation to family firm	Property rights	Trasnational focus group was build (managers, environmental Ngo's, fishers representatives and scientists)
capacity	End users'ability to modify fishing practices	Landings quality	Recreation	Trawling aggregation
catches	Environmental factors	Location	Relative stability	Trawling footprint
Coastal development	Fish population	Management strategies	Respiration	Unassimilated food
Competition	Fishermens views	Maturity ogive	Seabed integrity	Unspecified
Compliance	fishing dependency	Metier	Selectivity	Untrawled seabed
Co-viability	Fishing ground selection criteria	Nationality	Social equity	wellbeing
Culture	Fishing mortality	Natural mortality	social security	Working conditions
Damage to seabed	Fishing tactic	Other sectors at sea	Spatial analysis	Year of vessel construction
Date&hour	Fleet efficiency	Persistent organic pollutants	Spatial constraints	
Discards (proportion and composition)	Food quality	poaching	Spatial habitat data	
Economic and social parameters	habits	Pollution	Spawning season	
	heading		Speed	

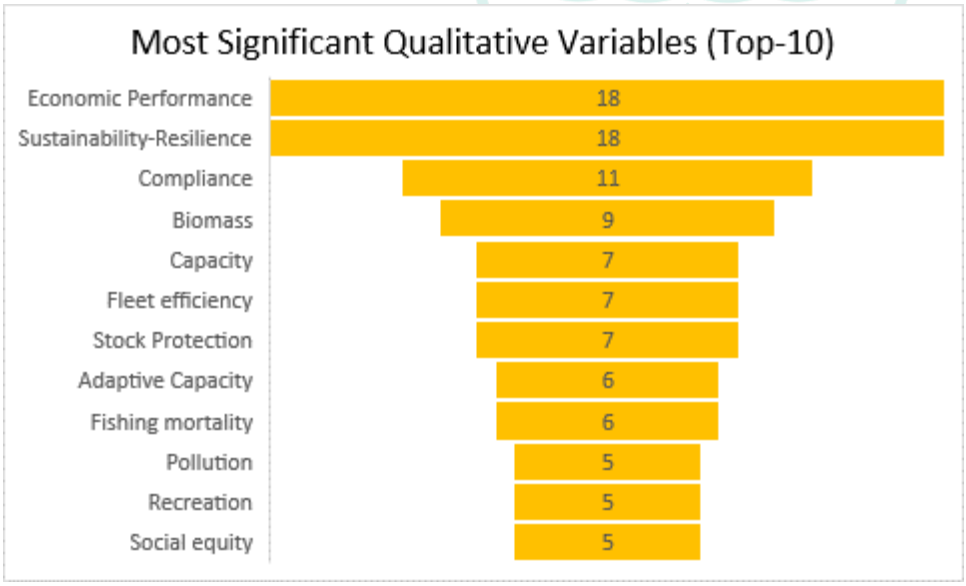


Figure 4.4-25 Most Significant Qualitative Variables (Top-10) in all regions

Type of Gears

The types of gears identified in the studies are listed in Table 10. The most frequently reported were trawl, seine and gillnets (Figure 4.26).

Table 10 Type of gears identified

Active gears	Netters
Creels	Passive gears
Dredges	Pelagic
Driftnets	Pole-lines
Fyke nets	Pots
Gillnets	Seine
Handlines	Swimmers
Hooks	Trammel nets
Industrial	Traps
Jigs	Trawl
Longlines	Unspecified
Mixed trawl	Various
Multi purpose vessels	

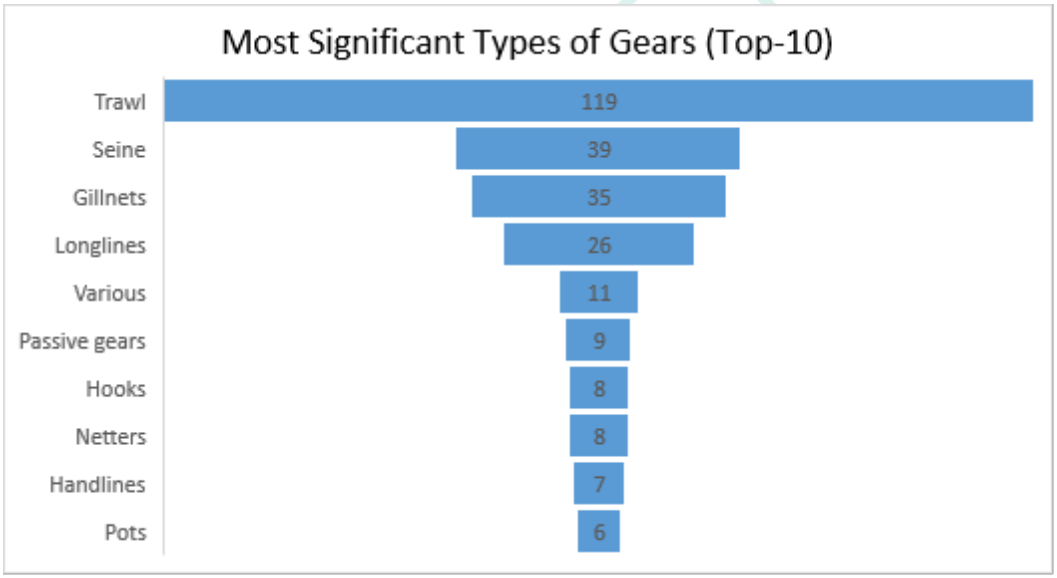


Figure 4.4-26 Most frequently occurring types of gears (Top-10) in all regions

4.7 Data Extraction from "grey" literature review

In addition to the bibliography reviewed for data extraction as described earlier, in Task 2.1 we decided to extract information from some additional reports.

These have been published by the Scientific, Technical and Economic Committee for Fisheries (STECF) of the European Commission and are directly related to the subject matter dealt with in Task 2.1, namely the economic impact of fisheries.

The reports used are:

Scientific, Technical and Economic Committee for Fisheries (STECF) – Methods for developing fishing effort regimes for demersal fisheries in Western Mediterranean-Part III (STECF19-01). Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-08330-6, doi:10.2760/249536, JRC116968

Scientific, Technical and Economic Committee for Fisheries (STECF) – Evaluation of fishing effort regime in the Western Mediterranean – part IV (STECF-19-14). Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-14097-9, doi:10.2760/295779, JRC119061

European Commission, Executive Agency for Small and Medium-sized Enterprises, Daskalov, G., Pinello, D., Scarcella, G., et al., Study on the evaluation of specific management scenarios for the preparation of multiannual management plans in the Mediterranean and the Black Sea, Publications Office, 2016, https://data.europa.eu/doi/10.2826/85917

4.8 Geographical coverage

The reports cover the entire Mediterranean area, both areas that are in the scope of Case Studies, and outside Case Studies.

Fisheries Management Policies

The Fisheries Management Policies studied by these reports are:

- Effort reduction, change in selectivity
- Effort regimes
- Effort regimes, closures, change selectivity
- Effort regimes, spatial closures
- Effort regimes, spatial closures, change selectivity, TAC
- Effort regimes, closures, fishing bans

The objective of all these Management Policies is stock recovery and the impact they have is primarily Economic.

No safe conclusion can be derived from our analysis as to the type of impact, i.e. positive, negative or neutral, that each policy has.

It seems that the impact direction depends on the *Type of Gear* and the *Fleet Scale*.

Models

The bioeconomic models identified in these reports are as follows:

- BEMTOOL

- IAM
- MEFISTO
- NIMED
- SMART

Quantitative Variables

The quantitative variables identified by the above reports are:

Costs (operational)
Costs (others)
CR/BER
CR/BER, revenues, net profit, average salary
CR/BER, ROI
Effort (days at sea)
Gain
Gross profit
Gross Value Added
Gross Value of Landing
Landings (Value)
Landings (Volume)
Wages

If we sort them by model type we have:

BEMTOOL
- CR/BER
- CR/BER, ROI
- Gross profit
- Landings (Value)
- Landings (Volume)
- Wages

IAM
- Effort (days at sea)
- Gross Value Added
- Gross Value of Landing
- Landings (Value)
- Landings (Volume)

MEFISTO
- CR/BER, ROI
- Landings (Value)
- Wages

NIMED
- CR/BER, revenues, net profit, average salary

SMART
- Costs (operational)
- Costs (others)
- Effort (days at sea)

Gain
Gross profit
Landings (Value)

Qualitative Variables

Our analysis suggests that the above models do not use qualitative variables

Type of Gears

The Type of Gears identified in the above-mentioned reports are:

- All fleet
- Gillnets
- Longliners
- polyvalent
- Trawl

The Management Policies that are relevant to each type of fleet are as follows:

All fleet
Effort reduction, change in selectivity
Effort regimes, spatial closures, change selectivity,TAC

Gillnets
Effort regimes
Effort regimes, closures, change selectivity
Effort regimes, spatial closures
Effort regimes, spatial closures, change selectivity,TAC

Longliners
Effort regimes, closures, change selectivity
Effort regimes, spatial closures
Effort regimes, spatial closures, change selectivity,TAC

Polyvalent
Effort regimes, closures, change selectivity
Effort regimes, spatial closures
Effort regimes, spatial closures, change selectivity,TAC
Effort regimes,closures, fishing bans

Trawl
Effort regimes
Effort regimes, closures, change selectivity
Effort regimes, spatial closures
Effort regimes, spatial closures, change selectivity,TAC
Effort regimes,closures, fishing bans

Fleet Scale

The reports we analyzed deal with both Large-scale and small-scale fisheries.

5. Comparison of identified key topics in AC scoping workshops and systematic reviews

Among management policies, both the systematic reviews and the stakeholder scoping identified MPA among the top five recorded issues. Economic aspects frequently recorded included landings value, profit, fuel costs, revenue and economically viable fishing industry. Among social aspects, there was greater discrepancy as windfarms, employment, local communities, food supply/food security and pollution were frequently mentioned in the AC scoping workshops but not identified as a key topic in the systematic reviews. Fleet capacity and effort control were mainly recorded in the systematic reviews.

6. Use of the results in subsequent SEAwise tasks

Task 2.1 contributes to subsequent Tasks by providing relevant information, as follows:

- ***Contribution to the synthesis of social-ecological systems framework (Task 1.6)***
- ***Comparison of different management strategies (Task 2.2)***
- ***Identification of the social impact of management measures on fisheries (Task 2.3)***
- ***Design of effective fisheries governance (Task 2.4)***
- ***Identification of the impact of eating different types of fish on the human health (Task 2.5)***
- ***Identification of the economic and social components of the entire Social-Ecological System (Task 6.1)***
- ***Evaluation of different fisheries management strategies (Task 6.5)***

7. Conclusions

The scoping consultations and systematic reviews identified a long list of potentially relevant key social and economic aspects and management measures. The top 5 by items identified in scoping with the stakeholders were windfarms, employment/jobs, MPAs, food supply, small-scale fisheries, local communities and pollution. The systematic review identified landings (volume or value), effort (days at sea), fuel costs, number of vessels, profit, aspects of costs, economic performance, sustainability-resilience, compliance and capacity as frequently occurring topics. The fisheries management policies most frequently mentioned were effort control, landing obligation, Individual Transferable Quota (ITQ), MPAs and TAC. Among the papers analyzed, more than 30%, concerned the Mediterranean region, followed by Western Waters, the North Sea and the Baltic Sea.

There was thus some agreement between aspects identified frequently in scoping and in systematic reviews, such as MPAs and small-scale fisheries, which were frequently identified in both methods. However, there were also aspects which appeared to be represented differently in the evaluations (e.g. employment and local communities) indicating discrepancies between the knowledge that is currently available and that which is sought by the end users.

8. Document Information

EU Project	No 862428	Acronym	SEAwise
Full Title	Shaping ecosystem based fisheries management		
Project website	https://www.seawiseproject.org/		

Deliverable	N°	D2.1	Title	Report on the key social and economic aspects of regional fisheries
Work Package	N°	2	Title	Social and economic effects on and of fishing
Work Package Leader	Isabella Bitetto			
Work Participants	Angelos Plataniotis, Phoebe Koundouri, Artemis Stratopoulou, Anna Rindorf, Nis Sand Jacobsen, Elliot Brown, Francois Bastardie, Marie Savina Rolland, Sonia Sánchez Maroño, Marga Andres, Dorleta Garcia, Sebastian Uhlmann, Dave Reid Giovanni Romagnoni, Maria Teresa Spedicato, Giuseppe Lembo, Isabella Bitetto, Angelos Liontakis, Celia Vassilopoulou, Nadia Papadopoulou, Marc Taylor, Alexander Kempf, Vanessa Stelzenmüller, Jochen Depestele, Katell Hamon, Marloes Kraan, Simon Northridge, Angela Muench, Rudi Voss, Søren Qvist Eliasen, Katia Frangoudes, Mike Heath, Nadia Moalla, Paco Melia, Jan Jaap Poos, Logan Binch			

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Due date of deliverable	30.04.2022
Submission date	30.04.2022
Dissemination level	PU[12]
Type of deliverable	R[13]

Version log			
Issue Date	Revision N°	Author	Change
30.04.2022			First version
12.05.2022	1	Anna Rindorf	Updated scoping with results from BSAC
05.10.2022	2	Anna Rindorf	Addition of doi, suggested reference and live links to other deliverbales.

[12]Dissemination level (DELETE ACCORDINGLY): **PU:** Public, **CO:** Confidential, only for members of the consortium (including the Commission Services), set out in Model Grant Agreement, **CL:** Classified, information as referred to in Commission Decision 2001/844/EC

[13] Nature of deliverable (DELETE ACCORDINGLY): **R:** Report, **DEM:** Demonstration, pilot, prototype, plan design, **DEC:** Website, patent filing, market studies, press & media, videos, **Other:** Software, technical diagram, etc., **Ethics:** Ethics deliverable