



Historical ties shape fisheries research in West Africa

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Received: 9 July 2025 / Accepted: 25 April 2026
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Abstract Marine fisheries, including industrial and small-scale fisheries, are a crucial sector for the food security and livelihoods of coastal communities in West Africa, as well as for global fish exports. Despite its significant social, economic and ecological impact, fisheries research in West Africa has been under-represented in global fishery science and not aligned with the local needs. This study aimed to provide a

comprehensive regional and country-specific analyses of fisheries science in West Africa through bibliometric and Large Language Models approaches based on 568 publications. Our results indicate that research is unevenly distributed in terms of both the countries contributing to it and the geographical areas covered. South Africa and Senegal are the main research hubs on fisheries, while significant gaps persist along the north-eastern coast and in the Gulf of Guinea. Geopolitical patterns were observed between European states and their former colonies, which may have led to a greater research focus on policy and socioeconomics. Some research topics have emerged in recent decades, such as maritime crimes and the human dimensions of fisheries, while others, like stock assessments and ecosystem-based approaches, continue to receive relatively little attention. Finally, future research directions in fisheries science are recommended based on the Ocean Decade priority actions that align with the local needs and capacities of West African countries.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11160-026-10059-y>.

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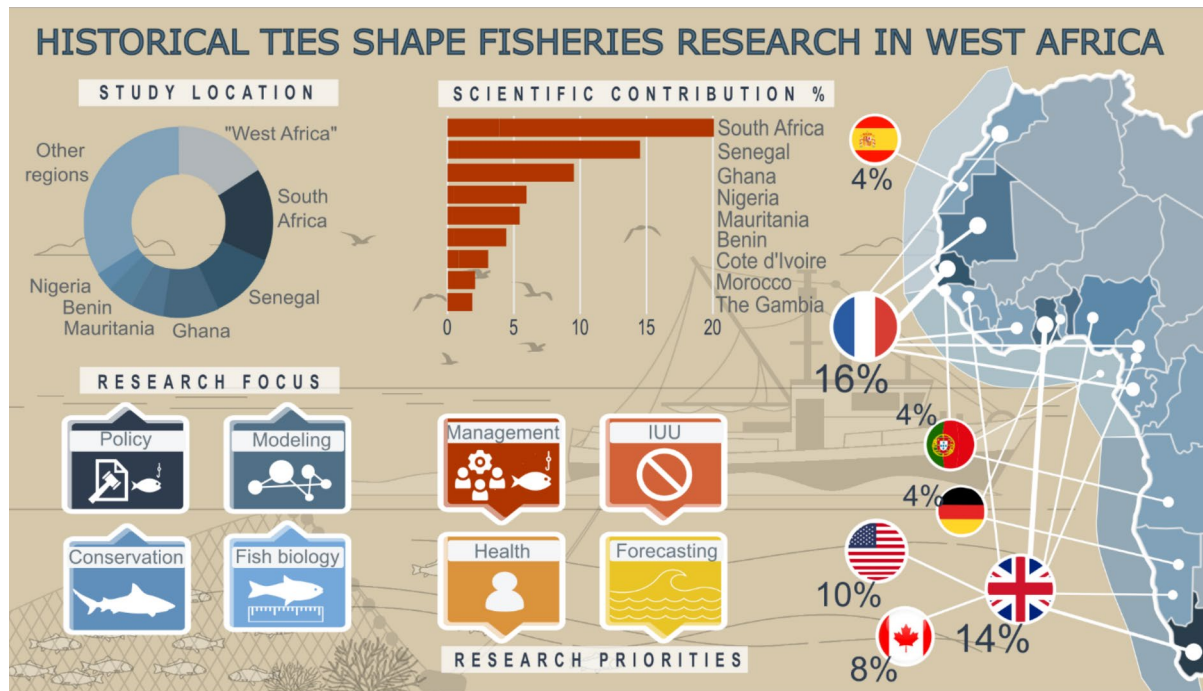
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Graphical abstract



Keywords Fishery science · Bibliometric analysis · Topic modelling · West Africa

Introduction

The West African coastal and marine pelagic ecosystems, extending from Morocco to South Africa and encompassing the islands states, are highly productive regions, largely due to upwelling and eddy systems driven by the Canary and Benguela currents (Cropper et al. 2014; Hagen et al. 2001). High levels of primary productivity in these Eastern Boundary Upwelling Ecosystems (EBUE) support large catches of migratory apex predators such as tunas and small pelagic fish such as sardines and anchovies (Brochier et al. 2008; Pauly and Christensen 1995). Aquatic animal food, mainly sourced from capture fisheries, is crucial for food security in Africa, accounting for 18% of the total animal protein intake, compared to 10% in high-income countries (FAO 2024). In sub-Saharan countries, such as Sierra Leone, Ghana and Sao Tome and Principe, this contribution rises to

almost 50% of the total animal protein consumption. However, the average annual per capita fish consumption in Africa (9.5 kg/year in 2022) is still considerably below the global average (20.7 kg/year in 2022) (FAO 2024; Tacon et al. 2025). Human population growth, combined with overfishing and limited aquaculture development has led to a decline in the supply of ocean-based protein sources, especially for coastal populations in West Africa (Belhabib et al. 2015a, b; Bara and Pierre 2024; N'Souvi et al. 2021).

The historical exploitation of West African fisheries by European and other foreign countries began during the colonial period and expanded in the post-colonial era (Alder and Sumaila 2004; Okafor-Yarwood and Belhabib 2020; Tickler et al. 2018). France, United Kingdom, Portugal and Germany were the main European countries colonizing West African states until the 1960s and 70s (former Portuguese colonies became independent in 1975). After independence, some countries faced political instability for many years or “transited smoothly to neo-colonies” where former powers still maintain privileged access to natural resources (Belhabib and Pauly 2015). In

the post-colonial era, fisheries exploitation and trade have intensified under bi-lateral or multilateral agreements (e.g. EU-SFPA), fishing access licenses or in exchange of financial support in sectors such education, health and infrastructure (Gagern and Bergh 2013). Instead of fostering sustainable domestic fishing industries, national research, and capacity building (Kaczynski and Fluharty 2002), these agreements have often prioritized foreign interests, hindering economic progress and threatening resource sustainability (Alder and Sumaila 2004; Belhabib et al. 2015a, b).

Growing concerns about sustainable fisheries management and advances in aquaculture have driven a significant global increase in fisheries science production over the past five decades, outpacing the overall increase in scientific production, particularly since the 1990s (Aksnes and Browman 2016). Northern developed countries have been leading effort in fisheries science, with a particular focus on species groups heavily targeted by them, such as salmonids, cod, tuna, sardines, and crustaceans (Aksnes and Browman 2016; Jaric et al. 2012). Despite the significant contribution of marine captures to the food security of West African coastal countries and its high vulnerability to the impacts of climate change (Belhabib et al. 2016; Katikiro and Macusi 2012), research efforts in the region remain limited and may not adequately address the region's research priorities (World Bank et al. 1991).

According to global analyses of research effort on fisheries science (Aksnes and Browman 2016; Jaric et al. 2012), South Africa was the only sub-Saharan country ranked among the top 25 contributors to fisheries research. The country accounts for three-quarters of the Sub-Saharan's total expenditure on research and experimental development (UNESCO 2021). A bibliometric analysis of the Fishery Committee of the Eastern Central Atlantic (CECAF), including selected countries from Morocco to Nigeria, indicated Senegal as the most productive, followed by Nigeria and Morocco (FAO 2022).

In general, research topics mapped in fisheries science literature were mainly dominated by “fishery biology”, “fishery statistics” (stock assessments) and “management” fields, while climate change, policy, and ecosystem modelling were far less frequent (Aksnes and Browman 2016; FAO 2022; Jaric et al. 2012). Although conventional bibliometric

approaches tend to use predefined topics of interest (Johnson et al. 2013), innovative approaches using Large Language Models for Topic Modelling have uncovered hidden topics in fisheries science literature (Syed et al. 2018a; Syed et al. 2018b). Social network studies have also emerged in fisheries science to reveal collaborations between authors, affiliations and fields of study (Olson and Pinto da Silva 2021; Syed et al. 2019). The key background literature related to fisheries research that was consulted for this study is detailed in SM1.

Investment in fisheries research and management are driven by a mixture of local priorities (e.g. recovery of depleted fish stocks), international interests (e.g. aquaculture development) and geopolitical relationships (Syed et al. 2019). In West Africa, where research largely relies on external funding and collaborations with institutions from the Global North (Boshoff 2009; Owusu-Nimo and Boshoff 2017; Sooryamoorthy 2010), the priorities of international donors or leading research institutions may shape the focus of research effort (Overland et al. 2022). When research is not articulated with local government and stakeholders, it can result in outcomes that will not be aligned with the immediate needs and local capacities, limiting its practical application for management and conservation. Therefore, understanding how research effort has been directed is crucial to evaluate the relevance of scientific production to problems on the ground and to guide future research.

This study addresses the following questions: (1) How is marine fisheries research in West Africa distributed spatially, temporally, and thematically? (2) What gaps exist in the current scientific literature on fisheries in the region? (3) To what extent do patterns in fisheries scientific production of West Africa reflect broader structural dynamics in global research systems?. Through a bibliometric analysis using Natural Language Processing (NLP) and machine learning, our results offer a comprehensive overview of fisheries science in West Africa, identifying the main research themes explored to date. Additionally, we examined the relationship between West African and non-West African affiliation countries and their association with research topics, highlighting the impact of external agents in shaping fisheries research in the region. Finally, we proposed a list of research

priorities tailored to the capacities and needs of West African states and communities to support effective management and conservation of marine resources.

Methods

Data collection and refinement

In this study, we considered West Africa as the region encompassing the 22 coastal countries from Morocco in the North to the west coast of South Africa in the South, as well as the Canary, Guinea and Benguela Large Marine Ecosystems (LME). Our bibliometric analysis followed a systematic workflow detailed in the following sections and illustrated in Fig. 1.

Document retrieval

To compile a comprehensive bibliographic database on marine fisheries research in West Africa, we performed a systematic search in the Scopus database. The search query included the following keywords: “fish*” AND “West* Africa*” AND (“marine” OR “sea”), applied to the title, abstract, and keywords sections of the publications. The wildcard character (*) was used to capture all suffix variations of the terms, such as fish, fish(ing), and fish(ery). Metadata and abstracts of all identified publications were extracted from the Scopus database and included in our bibliographic database. For the purposes of this study, no type of publication restriction was applied to the search, and we only analysed documents in English published by the end of 2023 (1954–2023).

We recognise that there are methodological limitations regarding the language and geographical definitions for West Africa. West African countries speak a wide variety of languages, including colonial languages such as French, English and Portuguese, as well as local African languages. Limiting the study to English literature may have led to a bias towards English-speaking countries and peer-reviewed articles, resulting in the exclusion of reports published in other languages. Using only “West* Africa*” as search term to define the locality may have limited the literature by excluding papers related to West

African countries which do not mention the term in the title, abstract or keywords.

Data extraction

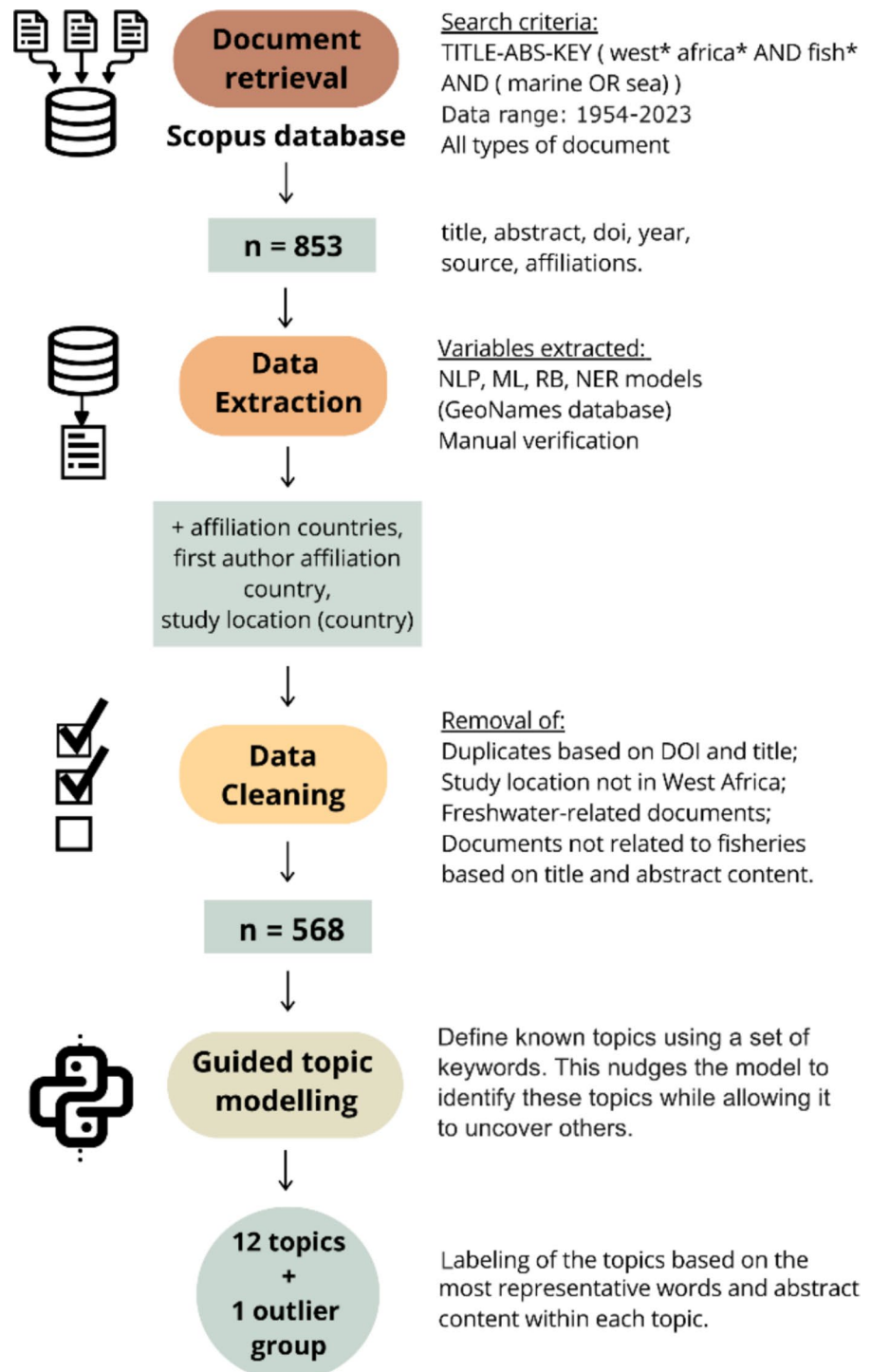
Information such as affiliation countries, study locations (countries, region or oceanographic system), and topics were extracted from abstract and metadata using Natural Language Processing (NLP) (Church and Liberman 2021) and machine learning. The affiliation countries of all institutions involved in each publication were extracted from the “Affiliations” section to assess the countries that most contributed to fisheries research in the region. The locations were programmatically extracted from abstracts using an open-source Named-entity Recognition tool, called *spaCy* (<https://spacy.io>). Additionally, study locations mentioned in the abstracts were mapped to match specific countries or oceanographic systems using the GeoNames API (<https://www.geonames.org/>). This step ensured that the study accurately captured the geographical focus of the research.

Data cleaning

The data cleaning process included the following steps: (1) Duplicate documents were removed based on DOI and title; (2) Manual verification of affiliation countries and study locations. Documents outside the geographical scope were removed; (3) Reassignment of specific study locations to country level; (4) Reassignment of study locations with broad range to LMEs categories or “West Africa”; (5) Manual verification of the titles to confirm that the subjects were related to marine fisheries. If the title was unclear, the abstract would be used for confirmation.

We acknowledge that errors may occur in retrieving the study location when multiple locations are mentioned in the abstract, for instance, for comparative purposes with the actual study location. These errors were minimised by manually verifying doubtful locations through an overall manual review of all study locations extracted from the abstracts and then, using filtering tools to identify potentially suspicious or inconsistent location entries. When the extracted location referred to specific sites within a country (e.g., coastal cities or ecosystems), the location was reassigned to the corresponding country to allow for consistent country-level analysis. Large Marine Ecosystems were

Fig. 1 Flowchart illustrating the systematic process of literature search, data extraction and topic modelling using Natural language processing (NLP), Machine learning (ML), Rule-based and Named entity recognition (NER) models



only considered as study locations if the abstract mentioned more than one country within the LME region.

Otherwise, the study location was identified as the single country where the study was conducted.

Guided topic modelling

We applied BERTopic (Grootendorst 2022) for topic modelling to explore the thematic structure of the corpus. First, we generated document embeddings using a pre-trained sentence-transformer model to capture the semantic meaning of the texts (Cohan et al 2020). These embeddings are multidimensional vector representations of the abstracts and are used for further computation. To align the model with our research objectives, we employed a guided topic modelling approach. We defined 14 seed topics based on established categories from FAO (2022) and Syed et al (2018), supplemented by specific themes of interest to this study (SM2). Each seed was represented by a list of representative keywords (e.g., “Keyword 1”, “Keyword 2”). During the dimensionality reduction and clustering phases, BERTopic used these seeds to bias the clustering toward these predefined themes. This approach also ensured flexibility to detect latent topics in the text that were not previously identified in the literature.

Results

From a total of 853 documents retrieved from Scopus database, 568 publications were used in our analysis after removing duplicates and publications out of geographical and research scope. The publications were distributed within 223 sources, including six books and four conference papers. The journals that contributed most were “African Journal of Marine Science” (7.2%), “Marine Policy” (7%), and “South African Journal of Marine Science” (5.3%). The top 10 journals together contributed to 37% of the publications (SM3). Fisheries research is relatively recent in West Africa. Despite the earliest available publications in the Scopus dating back to the 1950s, the increase in productivity only started from the 2000s, with a sharp rise observed from 2018 to present.

Geopolitical patterns and trends

Geographical interest

Research effort focused on geographical regions such as the broad West Africa range (16%), South Africa (16%) and Senegal (13%), followed by Ghana (9%) and other countries of the northern region of the

Gulf of Guinea (Fig. 2a). The countries least studied were Morocco and Western Sahara in North-west Africa, and from Equatorial Guinea to the Democratic Republic of the Congo in the southern region of the Gulf of Guinea. When considering only the documents citing the three large marine ecosystems (LMEs) of West Africa—Canary Current (CCLME), Guinea Current (GCLME) and Benguela Current (BCLME)—the Gulf of Guinea together with GCLME represented around 70% of the research outputs (GCLME only: 13%), followed by CCLME (23%) and GCLME (15%) (Fig. 2b). Publications mentioning “Gulf of Guinea” in the title or abstract were only considered in “GCLME” if the study encompassed more than one country in the region to avoid overestimation when accounting for studies limited to a single country of the region.

Leading contributors

The countries contributing most to fisheries research in West Africa were South Africa (20%), France (16.3%), Senegal (14.5%) and the United Kingdom (14.3%), representing around 65% of the analysed outputs (Fig. 3a). The United States and Canada have contributed to 10.2% and 8.2% of the publications, respectively. Only seven other West African countries were ranked in the top 20 affiliation countries, including Ghana (9.5%), Nigeria, Mauritania and Benin (6–4%). Other European nations that were former colonial powers, such as Spain, Portugal and Germany also ranked among the top contributors. In contrast, contributions from Asia and Latin America were comparatively lower. Publications prior to 2000 account for a minimal contribution for most affiliation countries, whereas post-2015 publications represent most contributions, with the exception for South Africa, France, Nigeria, and Norway (Fig. 3a).

When considering only the documents from the top ten journals (see SM2), the top 5 contributing countries remained the same (Fig. 3b). Instead, the Netherlands and Norway moved up in rank, while Spain, Portugal and Germany moved down. Interestingly, Australia and Brazil were the only non-African countries from the South hemisphere among the top 20 contributors. Regarding the first authors’ affiliation countries in the top 10 journals, we observed a higher dominance of South African affiliated authors (Fig. 3c).

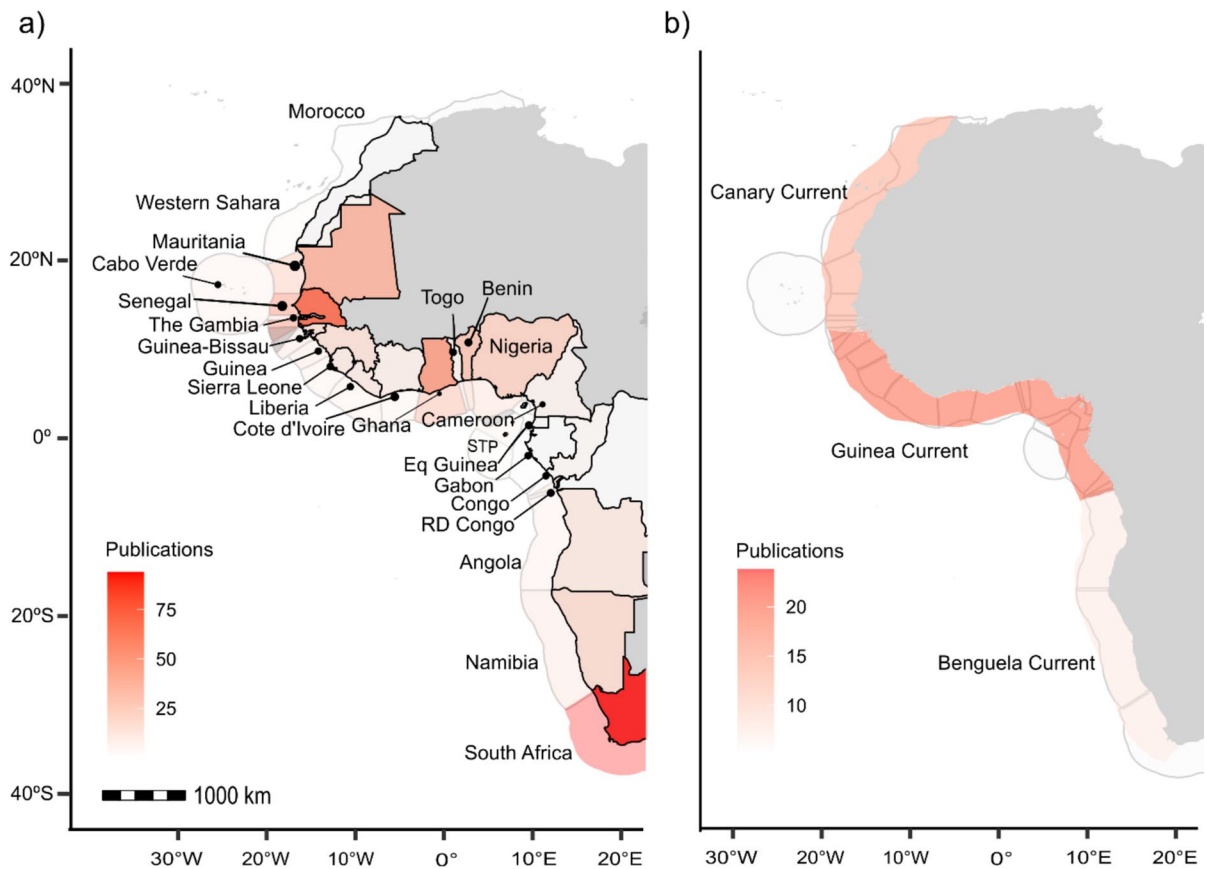


Fig. 2 Distribution of research effort (number of publications) focused on **a** West African countries and **b** main large marine ecosystems (Canary current large marine ecosystem

(CCLME), Guinea current large marine ecosystem (GCLME), Benguela current large marine ecosystem (BCLME))

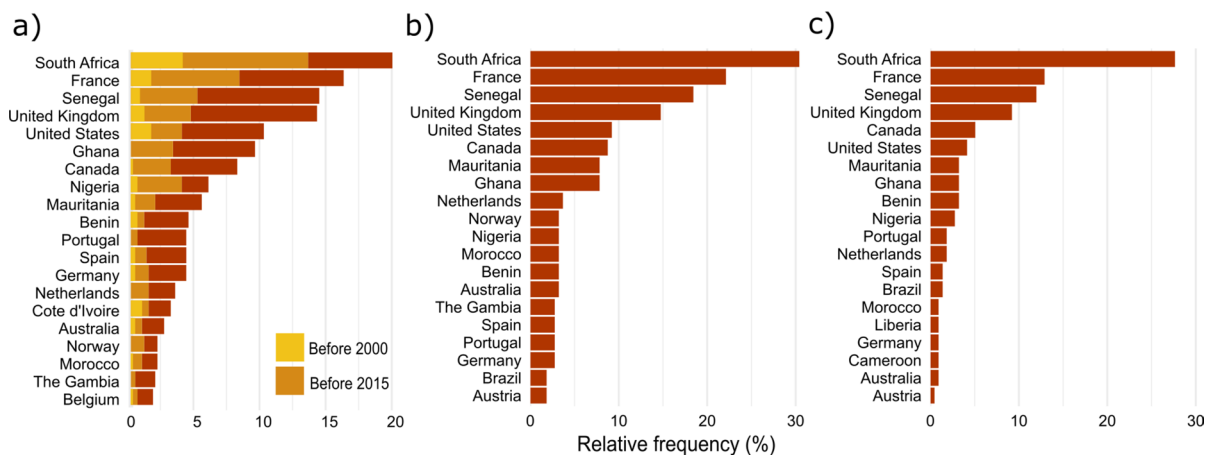


Fig. 3 Relative frequency of documents (%) by the top 20 affiliation countries. **a** Include all affiliation countries of all documents published before 2000 (golden), between 2000 and 2015 (orange) and after 2015 (red); **b** Include all affiliation

countries in the documents published in the top 10 journals; **c** Only include the first author's affiliation countries of documents published in the top 10 journals

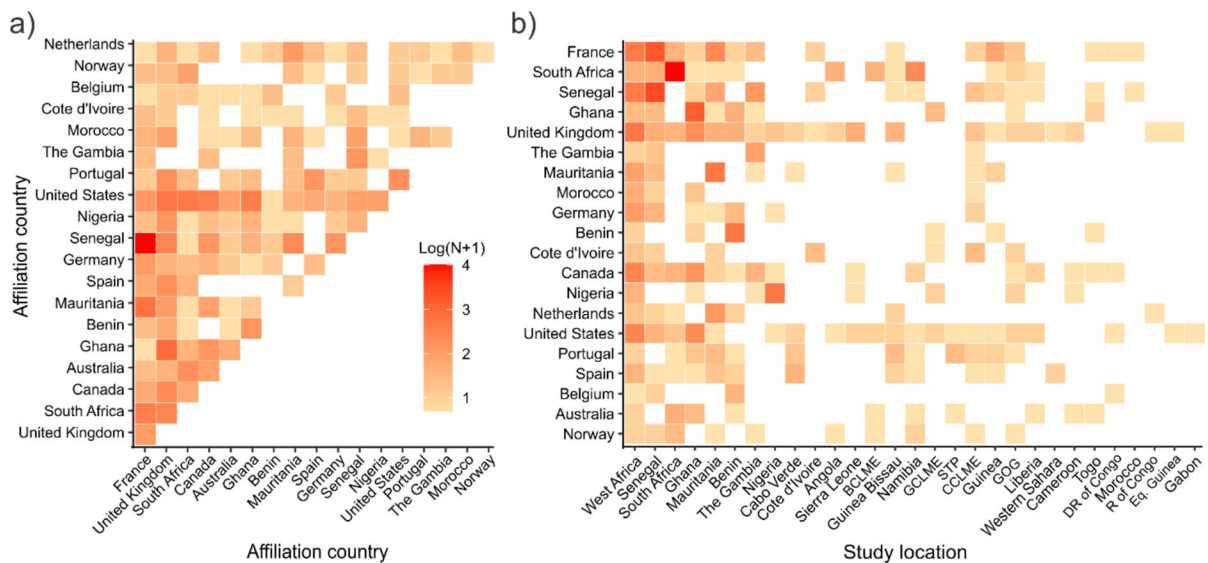


Fig. 4 Authorship and affiliation heatmap of **a** the co-authorship among affiliation countries, and **b** the correlation between affiliation country and study locations. Only the top 20 affiliation countries were kept for easier visualization. Values are log

$(n+1)$ normalized because discrepant values hindered the differences between the most common values. $N+1$ was used for log to avoid errors when taking the log

Co-authorship

Senegal, France and the UK were the leading affiliation countries in terms of co-authorship linkages, with 121, 112 and 98 connections among 16, 17 and 18 countries from the top 20, respectively. Notably, France and Senegal had the highest number of co-authored publications ($n=51$) by far, followed by the UK and Ghana ($n=18$) and France and Mauritania ($n=15$) (Fig. 4a). The West African countries with least collaboration linkages were Nigeria, The Gambia and Cote d'Ivoire.

Trends between authorship and study locations

As expected, the strongest correlation between affiliation country and study location was South Africa-South Africa, which indicates a high level of in-country research effort (Fig. 4b). South Africa has significantly contributed to research in Namibia, Angola and the BCLME. Senegal, Ghana, Mauritania, Benin and Nigeria have also focused fisheries research in their territory and neighbouring countries. Publications with broad geographical range ("West Africa") were led mainly by developed countries, including the UK, France, Canada and US, although

Senegal has contributed as well. Interestingly, English-speaking countries—such as the UK, Canada, the US, and Australia—have demonstrated significant contribution in research conducted within English-speaking Sub-Saharan countries, including Ghana, South Africa, Liberia, and Sierra Leone (Fig. 4b). A comparable trend was observed among French- and Portuguese-speaking countries. In the case of France, their research is focused on Senegal, Mauritania and Guinea, three former colonies, whereas it can be said that the UK's research is more evenly distributed in the region than France's.

Key research topics

A total of twelve topics were uncovered by the guided topic modelling developed in this study (SM4). Of these, 7 topics (fishery biology, spatial ecology, trophic ecology, genetics, climate change, oceanography and fishery assessment) directly corresponded to our initial seed topics, confirming their presence in the corpus. Other topics emerged either as a combination of seed topics (e.g. policy and socioeconomics), or as entirely new, data-driven themes structured by a unique representation of keywords (e.g. ecosystem

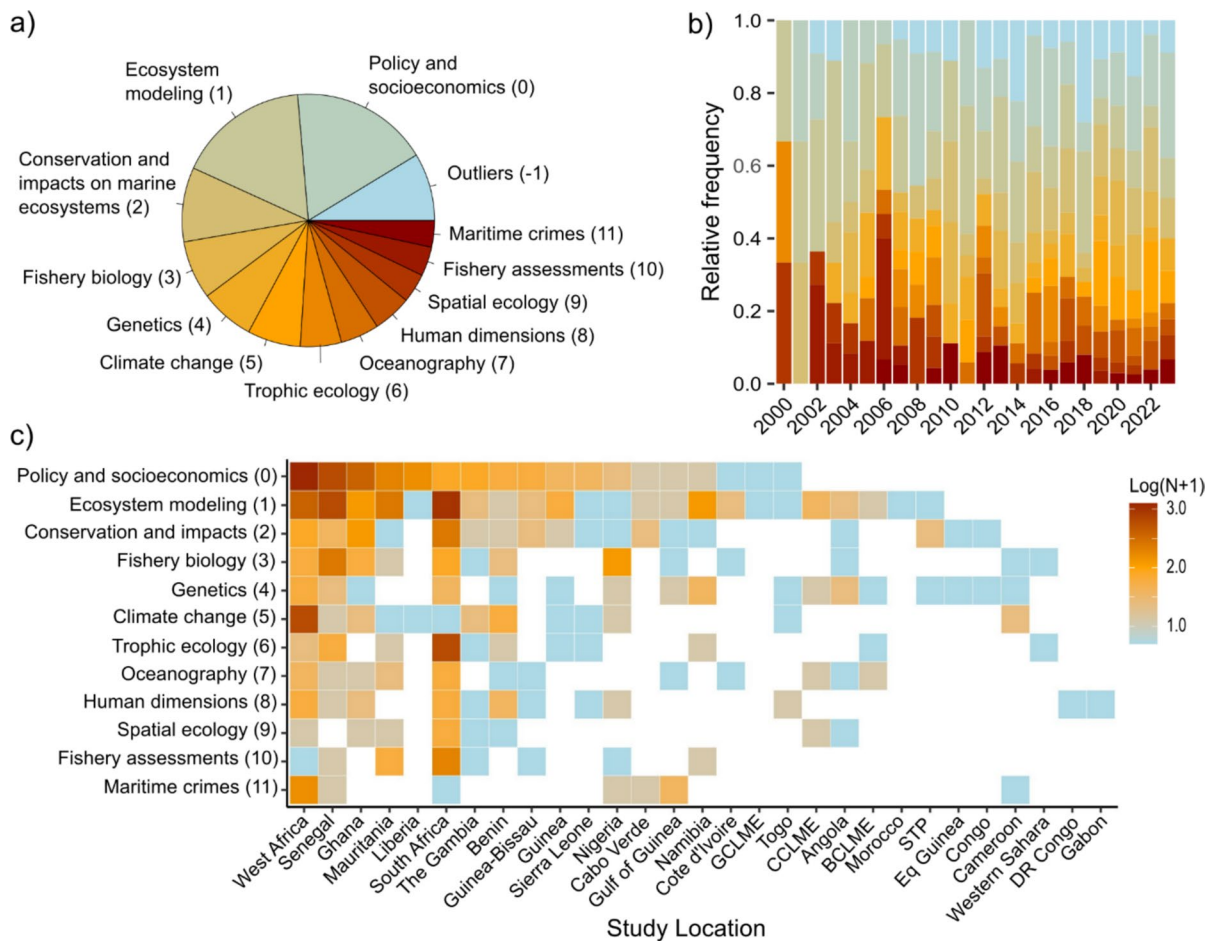


Fig. 5 Relative contribution of the topics **a** across the overall literature, **b** by year, and **c** correlated to study sites, log(N+1)-standardized. In panels (**a**) and (**b**), the topics are identified by colour. In panel (**c**) the reddish tones indicate a

higher contribution of the topic across the study sites, while light tones indicate a lower representation; white cells represent a null contribution

modelling, conservation and impacts, human dimensions and maritime crimes).

Approximately 50% of the analysed documents fell into four key topics: policy and socioeconomics (19%); ecosystem modelling (19%); conservation studies (8.5%); and fishery biology (7.5%) (Fig. 5a). Among these, policy and socioeconomics was the most prominent and consistently studied topic over time (Fig. 5b), encompassing research on fishing access agreements, regulatory frameworks, socio-economic assessments of fishery sectors, and conflicts between industrial and small-scale fisheries. Ecosystem modelling, while an early focus in the literature, has exhibited a declining trend as newer research themes have emerged. Conservation studies covered

a wide range of field areas, with particular emphasis on threatened species and ecosystems, notably sharks and mangroves. This topic also encompassed studies with a socio-ecological approach, including data based on local ecological knowledge. Although few documents mentioned marine protected areas, we did not identify any studies measuring the impact of management measures on fish stocks or threatened species and ecosystems.

Maritime crime and human dimensions of fisheries have emerged as some of the most recent areas of fisheries-related research in West Africa (SM5). The former primarily addresses issues such as Illegal, Unreported and Unregulated (IUU) fishing and other illegal or environmentally destructive activities

in the maritime domain. The latter includes social science perspectives, including studies on occupational dynamics, working conditions, human health and cultural practices (e.g. migration) related to fisheries. Climate change and oceanography have also emerged more recently, driven by a global demand for data-driven predictions.

From a geographical perspective, the topics most addressed in the West Africa region were policy and socioeconomic (23.2%), ecosystem modelling (13.7%) and climate change (15.8%) (Fig. 5c). South Africa was the only country where all topics have been addressed, although Ecosystem modelling and Trophic ecology represented the major research interests. Studies on policy and socioeconomics have been also conducted in Senegal, Ghana, Mauritania and Liberia, which might represent their importance on fisheries production and access to foreign countries.

Discussion

Global research effort in fisheries science has not been aligned with global fisheries production and the needs of less developed countries (Aksnes and Browman 2016; Oliveira Júnior et al. 2016), highlighting a critical gap in the global fisheries research landscape. In this study, we attempted to uncover this gap for one of the world's most productive regions using a combination of innovative AI-based methods. Our findings provide an overview of how marine fisheries research is unevenly geographically and thematically distributed in West Africa, as well as how patterns in scientific collaboration are biased to neo-colonial partnerships, also evidenced in other fields of study (Dahdouh-Guebas et al. 2003).

State of fisheries research in West Africa

Research leadership on fisheries science in West Africa was analogous to global trends (Aksnes and Browman 2016; Jaric et al. 2012), with North American (i.e. USA and Canada) and Western European (i.e. UK and France) countries exhibiting a predominance in the scientific production. China and Japan emerged as major contributors of global research effort since the early twenty-first century. However, they were not among the top 20 contributing countries in the present study, despite their considerable

economic influence in some African countries, particularly with regard to fishing access. Notably, China provides higher compensation for fishing access than the EU in several countries, including Cabo Verde, Guinea, Sierra Leone, Ghana, and Gabon. However, fishing agreements with China are sometimes criticized for limited transparency, which may contribute to increased instances of unreported catches and IUU fishing (Belhabib et al. 2015a, b).

South Africa, Senegal and Ghana were the main contributors to in-country fisheries research but still seemed to be strongly tied with their former colonial powers UK and France in terms of collaborations, as observed in previous studies (Adams et al. 2014; Syed et al. 2019). Besides co-authorship, these former colonial powers also demonstrated a high contribution to research conducted in their former colonial territories, indicating that colonial history may have played a pivotal role in shaping the geographic focus of their research interests in least developed countries. Collaboration between countries is likely to be driven by overlapping factors such as spatial proximity, language, trade blocs and colonial ties (Syed et al. 2019). In the last case, foreign-led research in developing countries and former colonies may not be aligned with local research needs and technical capacities (Boshoff 2009; Shrum and Shenhav 1995).

Collaboration between the USA, Canada and Australia with South Africa and Ghana could also be driven by historical factors (e.g. colonial ties; Adams et al. 2014; Boshoff 2009; Nagtegaal and de Bruin 1994) or by post-colonial political arrangements (e.g. aid programs) and concerns with sustainable fisheries (e.g. Sea Around Us research initiative). Interestingly, collaboration between English-speaking countries in West Africa—such as Liberia, Sierra Leone, Ghana, Nigeria and even South Africa—appeared to be less common, suggesting that a shared language may not be a primary driver for scientific or regional collaboration. Instead, Northwest African countries (from Morocco to Nigeria) are more likely to collaborate on fisheries initiatives.

Regional programmes such as the Sub-Regional Fisheries Commission (SRFC) and the Northwest African Regional Fisheries Programme (NARFP), which actively support the improvement of fisheries management, scientific assessment and monitoring, control and surveillance (MCS) systems are likely to play an important role in fostering scientific

collaboration and strengthening ties between North-west African countries. Syed et al. (2019) suggests that distant fishing interests also breed collaboration, as the case of the fishing interests of France and Spain along the Eastern Tropical Atlantic. However, there is no strong evidence that fishing agreements, particularly with non-European fishing powers such as Russia, Japan and China, have fostered the development of fisheries research in West Africa. Geall et al. (2023) recommend a requirement for a percentage of access and/or licensing fees in fishing access agreements between People's Republic of China (PRC) and West African states to secure funding for fisheries science, management, and enforcement.

Mapping research gaps

The two regions that appeared to be least represented in our dataset were the northeastern region (comprising Morocco and Western Sahara) and the southern region of the Gulf of Guinea, extending from Cameroon to the Democratic Republic of Congo. However, methodological limitations, such as retrieving articles using the search string “West* Africa*” rather than the names of each country in the study region, may have led to an underrepresentation of studies using alternative definitions of “West Africa” (e.g., from Mauritania to Nigeria) or not explicitly mentioning “West Africa” in the abstract. In addition, the linguistic diversity of the region may have influenced the results, as the exclusion of publications in other languages, particularly French, could limit the representation of research conducted by several West African countries (Potter and Pearson 2023). Despite these potential limitations, South Africa, often not considered part of West Africa, and Senegal, a predominantly French-speaking country, were among the countries with the highest scientific production in the dataset.

In addition to the regional gaps, most of the topics uncovered in this study demonstrate limited geographical representation, particularly “fisheries assessment”, “oceanography”, “human dimensions” and “maritime crimes” (Fig. 5c). This result partially contrasts with the bibliometric analysis of studies in the CECAF countries (FAO 2022), which has two categories including fisheries statistics and stock assessments accounting together to 33% of their literature. It is well known that misreporting

and underestimation of catches in West Africa, especially in artisanal and foreign industrial fisheries, remains a threat to fish stock management (Belhabib et al. 2014). Studies based on local ecological knowledge have also demonstrated a gradual shift towards smaller, lower trophic level species as larger predators are depleted (Macedo et al. 2025; Maia et al. 2018). Therefore, efforts to fill the gaps in fisheries assessment, particularly of artisanal and demersal fisheries along the West African coast, are crucial for management of overexploited stocks.

Beyond fisheries assessment, the limited representation of oceanographic studies related to fisheries in West Africa is particularly concerning given its fundamental role in shaping marine ecosystem dynamics and supporting adaptive fisheries management (Failler 2014; Lam et al. 2012). However, strengthening oceanographic research for adaptive fisheries management should be aligned with effective monitoring of fish stocks and marine ecosystems, which is still a challenge in most coastal African countries.

Finally, social sciences of fisheries were mainly captured within “human dimensions” and “maritime crimes”, which are also relevant for sustainable management of marine resources (Tam et al. 2024). Maritime crimes has been a recurring theme in studies of the Gulf of Guinea. The historical political instability, social conflicts, corruption and security issues might have hindered research development and international collaborations (Jacobsen 2017). This scenario of instability may also be associated with intense illegal activities at sea, including piracy, slavery and IUU (Belhabib et al. 2019), as evidenced by the growing focus on maritime crimes research in the region, drawing attention to the need to strengthen enforcement and transnational policies (Denton and Harris 2021; Phayal et al. 2024). In the absence of political stability and effective policies to combat maritime crime, the fields of ocean sciences and conservation will continue to encounter barriers to progress.

Research priorities aligned to regional needs and capacities

Fisheries science should be approached as an interdisciplinary field that addresses research questions concerning socio-ecological systems. We therefore suggest four key research priorities based on the findings of this study that are essential for understanding

marine fisheries and informing decision-making to achieve ecological and social conservation goals. These priorities also align with the priority actions 1, 2, 4 and 6, outlined in the Ocean Decade Africa Roadmap (UNESCO-IOC 2022):

- i. Sustainable management of fisheries and marine ecosystems should be a high priority research field to help securing the recovery and sustainability of fish stocks, as well as the restoration of key marine ecosystems. This priority is particularly linked with the topics “Conservation and impacts on marine ecosystems” and “Fishery assessments”, which appeared to have a restricted geographical representation in West Africa. Our study highlights the need for expanded fisheries assessments, as well as evaluations of conservation and management actions at regional and local scales, providing essential data to inform stakeholders and decision-makers.
- ii. Maritime crimes and security represents a significant challenge, particularly in the Gulf of Guinea, due to transboundary maritime activities, insufficient enforcement measures, and weak governance. As this is a relatively recent subject that has gained significant traction in the scientific literature over the past few years, we highlight the need to expand research to other geographical regions. Doing so is essential to accurately assess the magnitude of the humanitarian and environmental crises that this entails.
- iii. Social dimensions of fisheries should be addressed through a transdisciplinary approach that examines the relationships between fisheries, human health, and behaviour. Our study shows that research grounded in disciplines such as sociology, anthropology, and archaeology remains relatively recent and underrepresented in the fisheries literature in West Africa. However, understanding the evolution of livelihood strategies, human attitudes, and the social implications of fishing activities is essential for the development of more equitable, inclusive, and effective management frameworks.
- iv. Oceanographic observations and forecasting systems research is a high priority due to severe oceanographic changes affecting marine fish landings and supply and demand dynamics in coastal West African countries by the

2050s (Lam et al. 2012). Forecasting oceanographic systems and extreme events will support anticipatory mitigation and adaptive measures to climate risks. Our study identifies extensive geographic gaps in fundamental oceanographic observations across West Africa. The results highlight the urgent need for investment in technology and capacity-building programs across most coastal countries in the region.

Conclusion

The fisheries research output in West Africa has grown substantially since the 2000s, with particular emphasis on policy, ecosystem modelling, conservation, and fisheries biology. Despite this progress, research remains unevenly distributed, with South Africa and Senegal acting as primary hubs, while significant gaps persist in the northeastern coast and the southern Gulf of Guinea. Most studies have focused on specific themes like fisheries policy and socioeconomics, with comparatively less attention given to stock assessments and ecosystem-based approaches, which are critical for sustainable management amid increasing pressures from climate change and overfishing. Innovative, region-specific solutions for combating maritime crimes, particularly IUU fishing, must become a priority in future research agendas.

The continued dominance of non-African authorship highlights the urgent need to strengthen local research capacity and regional collaboration to ensure that scientific priorities reflect regional contexts. Enhancing regional collaboration, fostering transdisciplinary research, and investing in capacity building are critical to addressing existing data gaps and improving governance. Following inclusive, context-specific research agendas at regional and local levels will support policy-relevant science, guide sustainable resource use, and strengthen the resilience of marine ecosystems and coastal communities across West Africa.

Author contributions TM, ACC, HB and PZ contributed to the study conception and design. TM and HB conducted the literature search, data extraction and analysis. TM was the main responsible for data visualization and writing the first draft of the manuscript. ACC, HB and PZ commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Open Access Funding provided by Universitat Autònoma de Barcelona. This work contributes to the “ICTA-UAB María de Maeztu” Units of Excellence of the Spanish Ministry of Science and Innovation (CEX2019–000940-M) as part of the first author’s PhD and (CEX2024–001506-M). This work was also funded by EarlyFoods (Evolution and impact of early food production systems, 2021 SGR 00527) and MERS (Marine and Environmental Biogeosciences Research Group, 2021 SGR 00640) of the Generalitat de Catalunya, and the ERC Consolidator project TRADITION, which has received funding from the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme under grant agreement No 817911.

Data availability Data is provided within the Supplementary Information file 1.

Declarations

Conflict of interest The authors declare no conflict of interest.

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