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A systematic review of deliberation research in marine and coastal case studies

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Deliberation is an important concept in marine and coastal systems research because it is a key feature of many practical governance approaches such as participatory management, co-management, Integrated Coastal Zone Management, and Marine Spatial Planning. However, the research trends on deliberation have yet to be fully reviewed and evaluated to assess future opportunities and knowledge gaps in the field. In this article, we systematically review the literature to provide evidence on deliberation in marine and coastal governance systems. We review 187 case studies from peer-reviewed articles worldwide, guided by three areas of inquiry: (1) how deliberation is applied to frame the problem of the case studies, (2) methodologies used to evaluate and design deliberation processes, and (3) recommendations to increase the effectiveness of deliberation processes. Findings indicate there is uneven spatial distribution of studies between the global north and the global south. Most case studies used deliberation to develop recommendations related to participatory governance and most of the researchers actively participated to solve real-world problems by creating a deliberation process. In addition to that, recommendations from case studies indicate deliberation processes can provide a framework to enhance participatory governance/management and science-policy integration. Finally, we discuss the implications of the findings to guide continued research and practice engaged with deliberation activities. Our systematic review provides a foundational baseline for understanding the research trends on deliberation in marine and coastal governance systems. The findings of this review are relevant for future researchers and practitioners who consider deliberation as an essential element of participatory approaches in natural resource governance, especially in marine and coastal sectors.

KEYWORDS

deliberation, co-management, collaborative governance, participatory approach, marine governance, coastal governance

1 Introduction

Deliberation is an increasingly important concept for both governance practice and research methodologies. By definition, deliberation is “the act of thinking about or discussing something and deciding carefully” (Merriam-Webster, 2022). Meanwhile, deliberative processes in the social sciences are often portrayed as “a social, constructive and open-ended context where the exchange of arguments and reasons may facilitate the development of new, better informed and shared views among participants” (Birnbaum et al., 2015:447). Deliberation encourages debate and discussion to produce reasonable, well-informed opinions that might change the participants’ preferences (Chambers, 2003; Renn, 2006). Deliberation is different from ordinary discussion or dialogue; it works towards a conscious goal to provide information and structure to integrate knowledge and shift opinions as long as the participants are willing to reflect and update their beliefs (Goodin, 2000; Barabas, 2004). Furthermore, deliberation can be a key feature of participatory approaches aimed at creating informed discussions among participants about shared problems (Friess and Eilders, 2015). In transdisciplinary research, deliberation has been promoted as an integral process for ensuring the inclusion and legitimacy of scientific and non-scientific knowledge (Renn, 2021).

Deliberation in the field of natural resource management is important for enabling social engagement processes within collaborative governance and co-management approaches (Renn, 2006; US National Research Council, 2008). Indeed, some form of public participation is required by law in certain types of environmental decision-making, for example in the United States and the European Union (US National Environmental Policy Act, 1969; Aarhus Convention, 2003). There are two main streams of argument for this. One is from a normative angle, that people should have a say in the decisions that affect them. However, the more frequently used justification is pragmatic, that deliberation leads to better decisions that incorporate more sources of information in a thorough and considered process, which can enable governance processes and outcomes that are more likely to be accepted by the people involved. From this angle, deliberation can facilitate dialogue that allows different and multi-level stakeholders to develop and share views regarding collective action problems in natural resource management (Kenter et al., 2011; Eriksson et al., 2019). However, deliberation is not easy to implement. In practice, difficulties can arise due to the logistical concerns of recruiting participants (Griffin et al., 2015), the effort and time investments needed (Tomlin et al., 2015), potential inequalities of power and techno-bureaucratic control that distort communication (Ojha et al., 2014), and the risks of excluding underrepresented groups (Steel et al., 2020; Taitingfong and Ullah, 2021). In addition, poorly moderated and carelessly designed deliberation could lead to extreme disagreement, conflicts among participants (Gastil, 2018), or the domination of particular views when, for example, some participants are better than others at articulating arguments (Catala, 2015; Fishkin, 2019) or navigating social settings. When deliberation can mitigate those challenges and hazards, there is potential for changing participants’

mental models, increasing the amount of reasoning and information that enter their judgments, and the quality of decisions (Gastil, 2018).

Given the benefits and challenges of deliberation processes, it is crucial to understand more about the current practices of deliberation to inform continued research and practice. A synthesis of the current literature is needed to inform these goals, which adds value in three ways. First, to understand the common trends and discrepancies in conceptualizing and operationalizing deliberation in the literature. Second, to examine the methodological challenges based on case studies in natural resource management and governance. Third, to provide recommendations to guide deliberation in research and practices.

1.1 Deliberation in marine and coastal settings

Marine and coastal governance often grapple with overlapping multi-use spaces and boundary fluidity (Partelow et al., 2023). Many diverse people have livelihoods, values or political interests in shared coastal spaces (e.g., fishers, aquaculture farmers, tourists, shipping and port operators, miners, conservationists, etc.). Furthermore, the interactions of diverse stakeholders and existing governance mechanisms on the coast are often cross-scale and multi-level. This complexity is necessary to address the significant degree of overlapping uses placed on coastal systems, which are considered common pool resources (Rickels et al., 2016). There is also a three-dimensional governance challenge in the sea (Steinberg and Peters, 2015). For example, shipping uses the ocean surface and miners harvest the seafloor, while fishers and SCUBA divers use space up and down the water column. In fact, the boundaries of oceanic spaces extend onto the land (Peters and Steinberg, 2019), for example, as real estate developers, beachgoers, and wastewater drainages utilize the land-sea interface. All of these activities may occur simultaneously in the same area of a coastal space, making the coast functionally different from other natural resource systems, and therefore unique in the need to find effective multi-stakeholder governance solutions. As a result, knowledge and perspectives about management strategies are commonly multi-sided and contentious (Campbell et al., 2016). Ecosystem land-sea connectivity adds further complications because actions by people and governance mechanisms, often far from the coast, can have substantial impacts, such as watershed pollution from agriculture runoff (Lebel, 2012; Schlüter et al., 2019). Due to the above factors, stakeholders in marine and coastal systems face difficulties in finding participatory governance solutions that are inclusive and lead to equitable and just outcomes, this is often catalyzed by the complexity of social and ecological factors shaping the system’s functionality (Bennett et al., 2021).

Many practitioners and researchers have turned to deliberative approaches, making coastal spaces hotspots for the learning and evaluation of deliberation-based governance strategies and research (Brewer, 2012; Lopes and Videira, 2013; Dreyer et al., 2014; Falk-Andersson et al., 2015; Poumadere et al., 2015; Pieraccini and Cardwell, 2016; Webler et al., 2016). Thus, the governance of

marine and coastal systems is an ideal focal area to examine the diversity of applications of deliberative processes in environmental decision-making to summarize broad patterns and draw lessons learned. However, to our knowledge, no peer-reviewed studies exist reviewing current trends, gaps, and challenges. Systematically reviewing and categorizing the diverse framings in deliberation scholarship in marine and coastal systems and mapping them to policy and best practices recommendations are necessary to provide a foundation for future work. In doing so, important lessons can be distilled for coastal governance empirical research, theory, and practice.

This review aims to analyze the current state of research by first characterizing how deliberation is applied in published case studies in marine and coastal settings. We specifically focus on the case studies because they provide empirical applications and examples of the difficulties and opportunities that arise in deliberation in varied global contexts. Based on this, we conduct the systematic review of deliberation in marine and coastal case studies to analyze: (1) geographical distributions of case studies, (2) the operationalization of deliberation in research, (3) the framing of research problems based on deliberation, (4) methodologies used to evaluate and design deliberation processes, and (5) recommendations to improve deliberation in research and practice. The findings of this review are relevant for future researchers and practitioners who consider deliberation an essential element of participatory approaches in natural resource governance, especially in marine and coastal sectors.

2 Methods

Systematic literature reviews require guidelines to minimize subjective judgment and ensure the repeatability of the process and thus the comprehensiveness of findings (Haddaway et al., 2015). The Preferred Reporting Items of Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed in order to help ensure that the standard requirements of systematic reviews were met (Moher et al., 2009). The selection and screening process is summarized in Figure 1.

We systematically searched for deliberation case studies in marine and coastal areas. In the search for empirical studies, this study relies on peer-reviewed academic articles from the bibliographic databases in Scopus, Web of Science, and Wiley Online Library with open access or subscription based to support rigorous evidence identification. The selection process of bibliographical databases considers each database's technical characteristics and limitations to the review topic. In this study, the review team consists of three reviewers to help with data extraction, screening, and the appraisal process, as recommended by Haddaway et al. (2020).

2.1 Identification of literature

In this review, a case study is defined as empirical research to investigate or design deliberation practices at single or multiple

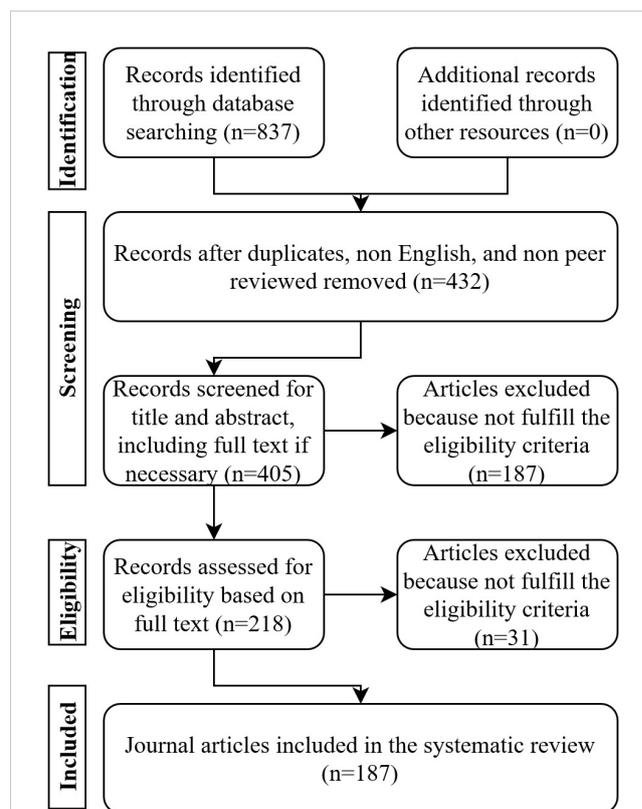


FIGURE 1
Selection and screening process of journal articles based on the PRISMA flow diagram.

study locations to govern and/or manage marine and coastal spaces and/or resources. The study only considers peer-reviewed academic journal articles to ensure the quality of publications and enable search replicability. Furthermore, we only included English language articles due to language barriers in the research team and to avoid including some languages and not others. English is also the dominant language of highly visible and high-level international research shaping the related fields of research (Montgomery, 2009). As a result, we excluded 43 non-English publications.

The search strings used Boolean operators to identify relevant articles using indicator words from titles, abstracts, and keywords. We ended the search on 23 February 2022 and included all possible articles published available before this date. We did not include “case study” in the search strings to eliminate the possibility of excluding the articles that could have been used with “empirical case/study” and other keywords. The indicator words used in the search string related to deliberation in marine/coastal areas and included the following:

deliberat* AND “fish*” OR “ocean” OR “marine” OR “sea” OR “aquaculture” OR “offshore” OR “coast*” OR “shipping” OR “tourism” OR “recreation” OR “beach” AND “management” OR “governance” OR “policy” OR “comanagement” OR “co-management” OR “planning” OR “govern*”

. It is easier to justify a sampling frame for papers that focus on deliberation by selecting those that use the actual term, and then screening out papers that use the term but do not meet the selection

criteria in the resulting smaller sample. In contrast, it would be much less defensible to set the boundaries for a systematic review sample to try to capture all the papers that cover all the plural definitions of deliberation, with authors that do not use or identify with the term deliberation, but address the concept in other ways potentially using related terms (e.g., participatory management). During the design of this study, it was clear that the latter approach was not tractable systematically and without many questions and assumptions about the notion of what constitutes a tangential or related deliberation study – it would have been far more difficult to justify and execute methodologically. Our sampling approach ensures a high specificity of the end sample related to the aim of the review focus. The search results from Scopus, Web of Science, and Wiley Online Library were exported and checked for title duplicates. The following information from each database was exported: author, title, year of publication, DOI, link, affiliations, and abstract. The initial database resulted in 837 unique journal articles.

2.2 Screening and eligibility assessment

The inclusion criteria consisted of case studies within marine and coastal contexts from a peer-reviewed academic journal article with full-text availability in English. In addition, each article related to the concept of deliberation, either in the problem framing, methodology, or recommendations. An article would be excluded if it used ‘deliberate’ or ‘deliberately’, or referred to ‘intentionally’ or ‘carefully’ but did not specifically address the concept of deliberation. After removing duplicates, and journal articles with non-English literature, non-peer reviewed, and no access possibilities after contacting authors, data set was reduced to 405 journal articles.

Then, a more detailed article screening process was conducted in two phases: abstract screening and full-text screening. First, the 405 journal articles were individually screened based on the title and abstract for content matching the study’s aim. This phase resulted in 218 journal articles eligible for inclusion. Second, full-text screening was conducted, resulting in the final data set of 187 journal articles.

The appraisal phase was led by the lead author AOP, who randomly selected abstracts and papers to screen. Approximately, 40 papers in the first phase and 10 in the second phase. The randomly selected abstracts and papers were independently assessed and coded by all authors. A group discussion was held to discuss the inclusion criteria and coding result after each appraisal phase. The goal was to improve our collective understanding and ensure that a consensus based coding approach was being followed going into the final selection.

2.3 Indicators for data collection

We developed indicators to analyze the final data set of 187 journal articles. We used qualitative content analysis transformed into categorical data to analyze data set of articles. First, we wanted to collect the following data: study location by country, study

location by continent, first author’s location by country, first author’s location by continents, and year of publication. As the focus is on case studies, geographical overview is important to provide a more complete understanding of the current state of research that can inform future directions. In our review, the geographical overview aims to identify knowledge gaps, especially where research in deliberation remains scarce. Further, the issue of geography (particularly with regards to author origin and case study location) is especially relevant in the deliberative case study context. Normative aims for stakeholder inclusion and participation have gained recent attention – often raised alongside critiques of parachute science – which raises concerns that researchers primarily from the Global North are conducting research in the Global South that only benefits their home countries without capacity building, knowledge exchange activities, and engagement with the researchers from lower income countries (Stefanoudis et al., 2021). Second, we included the categorization of deliberation in case studies to understand the proportion of research that uses deliberation in the problem framing, methodology, and/or recommendations. These initial three categories were identified inductively by the authors, and used in this review to highlight key areas that deliberation is used as a concept in research, and organize information collected from different case studies. Sub-categories were incorporated into subsequent analysis, as new themes arose in data collection and analysis. A list of subcategories for each indicator is available in our codebook [Supplementary Material 1](#).

Each article was coded in relation to how it engages with the concept of deliberation, which could be one or multiple of the following three categories: (1) how deliberation is applied to frame the problem of the case studies, collected from the introduction section, (2) methodologies used to evaluate and design deliberation processes, collected from the methods section, and (3) recommendations to increase the effectiveness of deliberation processes, collected from the discussion and conclusions sections of the respective papers. Articles coded as providing a recommendation refer to articles making explicit claims regarding the need for deliberation processes in their discussion or conclusion sections.

Articles categorized into ‘problem framing’ (first category) were coded into one of the following four categories: (a) researchers state their research question or objective is to develop deliberation support tools to improve the deliberation process, (b) researchers state their research question or objective is to conduct a deliberation process, (c) researchers state their research question or objective is to evaluate deliberation outcomes, or (d) researchers state their research question or objective is to evaluate a deliberation process.

Articles categorized into ‘methodology’ (second category) were coded into the participation level of researcher, (a) researchers’ active participation by creating a deliberation process and inviting relevant participants or stakeholders to collect the relevant data, or (b) the researchers’ passive participation to observe or evaluate a deliberation process developed by other stakeholders with minimum intervention. The same subset of data was further coded to understand the role of different stakeholders as a participant, organizer, and moderator in deliberation.

Articles categorized into ‘recommendations’, (third category) were coded into one of three categories in reference to the scale of the recommendations provided: (a) local, (b) national, or (c) international. Local-level recommendations are related to deliberation practices that are relevant for one or multiple communities, national recommendations refer to a specific country, and international refers to more than one country or can be applied globally. In addition, the ‘recommendations’ in this subset of articles were coded based on the scope of the recommendations, (a), recommendations to address the constraints in the deliberation processes, including the challenges and potential issues from deliberation for future studies or deliberation practices, (b) recommendations to use deliberation as a learning tool to facilitate knowledge exchange, (c) recommendations to use deliberation to establish a participative, collaborative, and inclusive approach, (d) recommendations to use deliberation in research or decision/policy-making processes, or (e) recommendations to use deliberation to enhance science and policy integration in theory and practice.

Once all indicators had a data range and classification categories, we produced a standardized evaluation form that could be applied to examine each article. A randomized sub-set of articles was independently evaluated with the standardized form by all co-authors to ensure coding consistency and reliability. These initial results were compared among the co-authors, and points of disagreement on how an article was classified were discussed to develop a common understanding, or consensus, on how to classify articles for each indicator. Three rounds of reliability checks were conducted until a consensus was reached.

3 Results

3.1 Geographical distributions of case studies

The geographical distribution between the research affiliation location of the first author and the study location was uneven, as depicted in a bipartite plot in Figure 2. The highest percentage of first authors are located in Europe (n=82, 44%), followed by North America (n=58, 31%), Oceania (n=23, 12%), South America (n=10, 5%), Asia (n=8, 4%), and Africa (n=6, 3%). We observed a similar trend in the study location, distributed as follows: Europe (n=90, 40%), North America (n=57, 25%), Oceania (n=22, 10%), Asia (n=22, 10%), South America (n=19, 8%), and Africa (n=11, 5%). There was a clear distinction between the study and author locations. In Europe, North America, and Oceania, marine and coastal deliberative research was dominated by local researchers, while Asia, Africa, and South America have larger percentages of foreign researchers.

In the analysis by country, the United States of America (USA) had the highest number of the first authors (n=47, 25%) and location of case studies (n=43, 23%). This is followed by the United Kingdom where the first author research affiliation located (n=22, 12%) and case studies located (n=25, 13%). Though the USA, Australia, Sweden, Canada, Netherlands, and Germany were heavily represented as being study site locations in the data, they

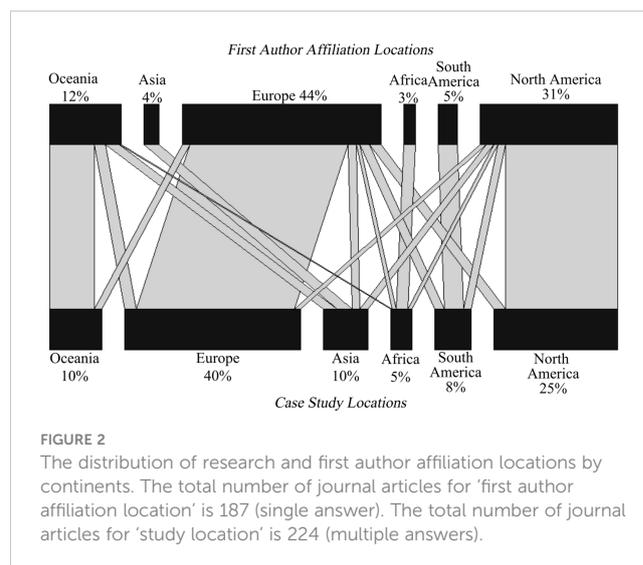


FIGURE 2 The distribution of research and first author affiliation locations by continents. The total number of journal articles for ‘first author affiliation location’ is 187 (single answer). The total number of journal articles for ‘study location’ is 224 (multiple answers).

were more frequently listed as the location of the first authors’ affiliation than as the location of a study site. The visualization of the first author affiliation and study locations can be found in [Supplementary Materials 2A, B](#).

3.2 Operationalization of deliberation in research

All articles reviewed were categorized into one or multiple ways of engaging with the concept of deliberation in the literature (Figure 3). Most of the articles provided recommendations related to deliberation in coastal marine governance and management (n=125, 67%), methodologies used to evaluate and design deliberation processes (n=120, 64%), and problem framing based on the deliberation concept/approach (n=82, 44%). There were 21 journal articles (11%) that engaged with both problem framing and methodology, 31 journal articles (17%) that engaged with both methodology and recommendations, and 15 journal articles (8%) that engaged with both problem framing and recommendations. There were 41 journal articles (22%) that engaged with all three categories.

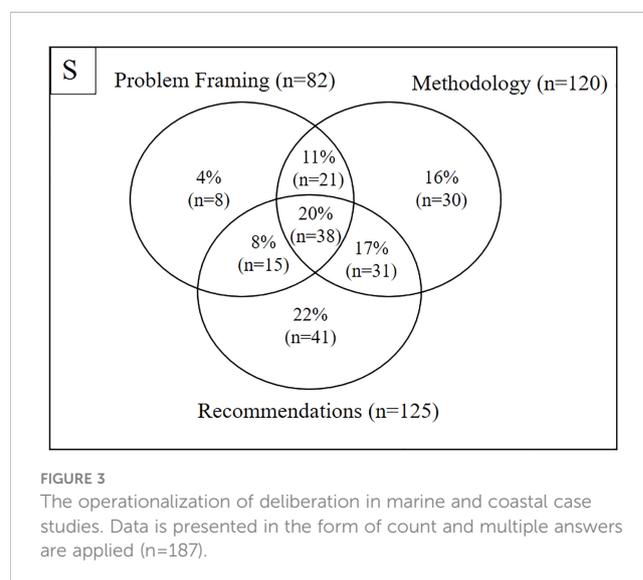


FIGURE 3 The operationalization of deliberation in marine and coastal case studies. Data is presented in the form of count and multiple answers are applied (n=187).

methodology and recommendations, and 15 journal articles (8%) that engaged with both problem framing and recommendations. Meanwhile, 38 journal articles (20%) engaged with all three components in their study design.

Case studies engaging with concepts of deliberation start to appear in the early 1990s (Figure 4A). Even though the number of case studies were fluctuating over the years, there was a gradual increase over time. In the last five years, there has been an influx in studies providing recommendations related to deliberation ($n=63$, 34%), methodologies used to evaluate and design deliberation processes ($n=59$, 32%), and framing of the research problem ($n=40$, 21%). Meanwhile, the analysis based on study location shows that these increases were mainly driven by researchers in Europe and North America (Figure 4B).

3.3 Deliberation as a problem framing

We analyzed 82 journal articles that fit into the problem framing category. Figure 5A shows the proportion of the framing of research problems across the case studies. The research problems were framed to conduct a deliberation process ($n=42$, 51%), evaluate a deliberation process ($n=38$, 46%), evaluate deliberation outcomes ($n=33$, 40%), and only 10% ($n=8$) aim to develop deliberation support tools. The deliberation support tools established by previous studies, extracted from our review, include Multi-Criteria Approaches (MCA), Deliberative Monetary Valuation (DMV), Deliberative Valuation (DV), Vulnerability Consequences, and Adaptation Scenarios (VCAPS), Choice Modelling (CM), Value and Ecosystem-Based Management Approach (VEBMA), Scenario-based Stakeholder Engagement (SBSE), Decision Support Systems (DSS), and System Approach Framework (SAF). Figure 5B shows a steady increase in the number of publications that used deliberation to frame the research problems in marine and coastal studies, especially case studies that developed a deliberation process. Figure 5C shows that the majority of case studies were conducted in Europe and North America across all categories.

3.4 Methodologies used to evaluate and design deliberation

The second category is understanding different methodologies for examining deliberative processes in marine and coastal case

studies. We analyzed 120 journal articles in this category. The majority of the journal articles used qualitative methodologies ($n=76$, 63%), a third used mixed methodologies ($n=42$, 33%), and only 3% ($n=2$) used only quantitative methodologies.

In the analysis based on the level of participation of researchers, 70 articles (58%) were coded based on the active participation of researchers, and 50 articles (42%) were coded based on passive participation. The majority of methods with active participation of researchers to develop deliberation processes were participatory workshops ($n=47$, 39%), surveys ($n=32$, 27%), interviews ($n=26$, 22%), group discussions ($n=17$, 14%), and document analysis ($n=13$, 11%). Meanwhile, the majority of the methods used with passive participation of researchers to study deliberation conducted by other stakeholders were interviews ($n=32$, 27%), participant observation ($n=32$, 27%), document analyses ($n=25$, 21%), surveys ($n=12$, 10%), and deliberation ($n=12$, 10%). Several studies mentioned “deliberation” as a method to refer to the deliberation conducted by other stakeholders. Data is presented in Figure 6.

Furthermore, we categorized the role of stakeholders into the participant, organizer, and/or moderator in the deliberation process as depicted in Figure 7. The researcher was the most prominent organizer ($n=76$, 63%) and moderator ($n=33$, 28%) of deliberation processes, while the majority of the community was taking the role of participants ($n=65$, 54%).

3.5 Recommendations to increase the effectiveness of deliberation processes

The third category of the analysis is to understand the recommendations from case studies to increase the effectiveness of deliberation processes. We analyzed 125 journal articles that fit into the recommendations category. The majority of journal articles provided recommendations related to deliberation at the local level ($n=60$, 48%), followed by the international level ($n=38$, 30%), national level ($n=27$, 22%). Most of the studies in North America included recommendations for the local level; meanwhile, the case studies in Europe mostly included recommendations for the international levels as depicted in Figure 8.

The recommendations were also categorized into different scopes: (1) recommendations to use deliberation to establish a participative, collaborative, and inclusive approach ($n=67$, 54%),

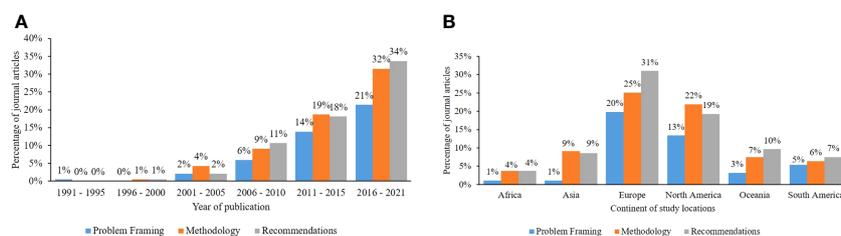


FIGURE 4

The operationalization of deliberation in marine and coastal case studies based on (A) year and (B) continent. Data is presented in the form of count and a single answer is applied ($n=187$).

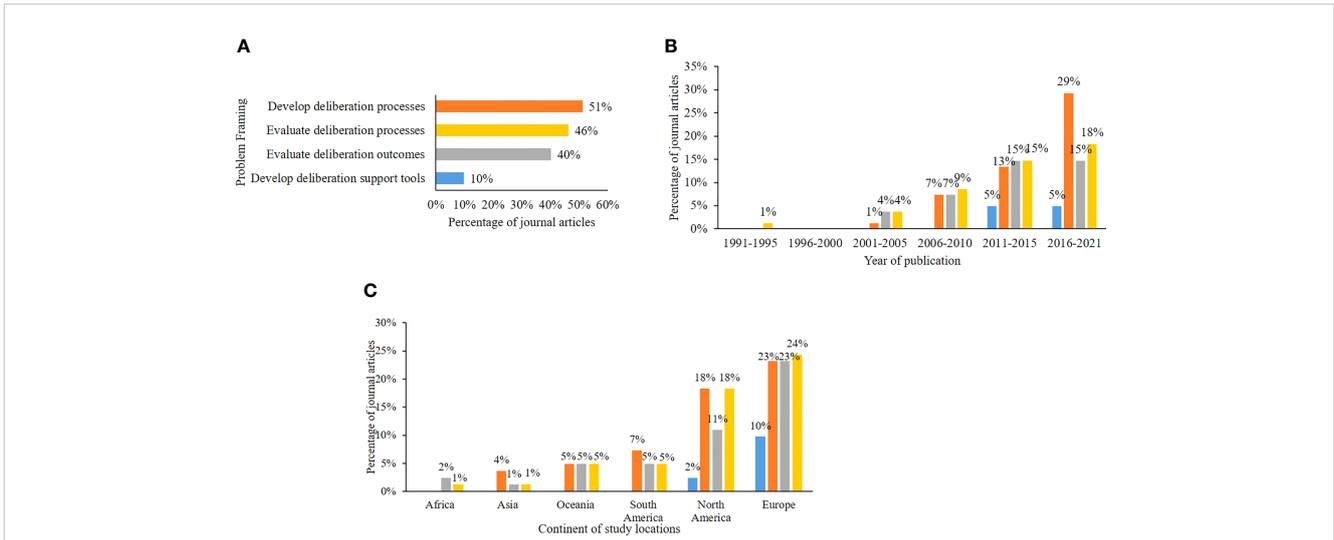


FIGURE 5
The framing of research problems is based on deliberation in marine and coastal case studies based on (A) general proportion, (B) year, (C) continent of study locations. Data is presented in multiple answers (n=82).

(2) recommendations to use deliberation to enhance science and policy integration in theory and practice (n=53, 42%), (3) recommendations to use deliberation as a learning tool to facilitate knowledge exchange (n=50, 40%), (4) recommendations to use deliberation in research or decision/policy-making processes (n=39, 31%), and (5) recommendations to address the constraints in the deliberation processes, including the challenges and potential issues from deliberation for future studies or deliberation practices (n=21, 17%). The constraints of deliberation found in this review are synthesized into specific types of problems that are further supported by the literature, including the selection of participants for inclusive deliberation (Rockloff and Lockie, 2006; Tam, 2006; Rydin et al., 2018; Prado et al., 2020), differences in communication style and culture (Stratoudakis et al., 2020), existing conflict prior deliberation (Narula, 2016; De Koning et al., 2020), conflicts occurring after deliberation (Skladany et al., 2007; Blunkell, 2017),

and power imbalances among stakeholders (Prado et al., 2020; Rasheed and Abdulla, 2020).

4 Discussion

4.1 Geographical distribution of research across the regions

Our findings show that the proportion of study and author locations are unevenly distributed. In Asia, Africa, and South America, a substantial amount of research is conducted by authors from outside those continents. Thus, a notable imbalance exists between study locations and first author affiliation locations, which has been already documented in the marine sciences (Stefanoudis et al., 2021). As Campbell et al. (2016) mentioned, there are differences and power imbalances in ocean governance and management strategies between developed and developing worlds, even though the diversity of actors involved in deliberation processes has evolved. Such a bias narrows the understanding to a particular worldview of governance and management in marine and coastal sectors and is influenced by structural path dependencies of knowledge production by North American, European, and Australian science programs (Partelow et al., 2020a; Partelow et al., 2023). Partelow and colleagues also show that the emergence of new concepts and approaches tend to originate in Europe or North America, while the appearance of those same concepts in articles led by authors from other continents tend to emerge later. A similar pattern is observed in our deliberation data, for instance our data show that the deliberative research in Asia was led by first authors from Oceania, Europe, South America, and only several from Asia.

The small numbers of the first authors and research affiliations in the least developed countries and small island developing states may reflect a lack of domestic scientific funding generally, or the

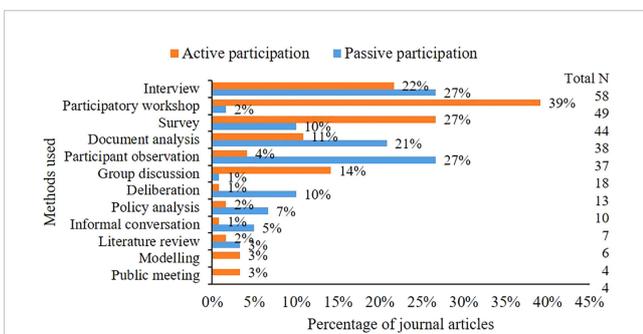
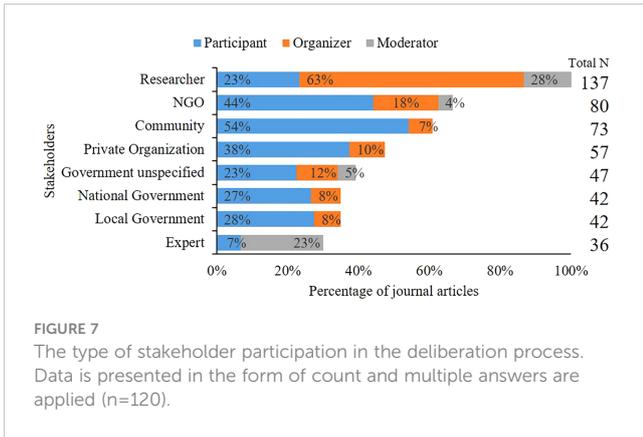
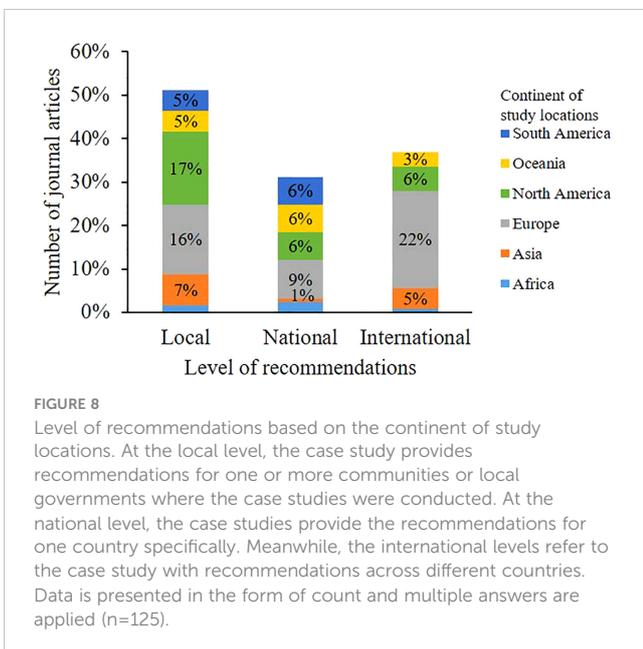


FIGURE 6
The type of methods used in the deliberation process of marine and coastal case studies were based on the participation of the researcher. The active participation of researchers refers to their role in creating a deliberation process and inviting relevant participants. The passive participation of the researcher refers to the study of the deliberation process that was conducted by other stakeholders. Data is presented in the form of count and multiple answers are applied (n=120).



lack of social science research in those countries more specifically (Barber et al., 2014; Blasiak et al., 2016; Tolochko and Vadrot, 2021; Partelow et al., 2023). The presence of marine social science is essential for understanding the human dimensions of coastal and marine use and, thus how such systems are governed and managed to incorporate those dimensions (Bavinck and Verrips, 2020; McKinley et al., 2020). In relation to that, transdisciplinary research is an emerging field that has shown to improve outcomes related to inclusion and decision-making in communities with diverse backgrounds, while also enabling the production of diverse types of knowledge that include social science can more effectively inform decision-making within collaborative and deliberative governance settings on the coast (Bennett, 2019; Turnhout et al., 2020). On the one hand, the significant increase in marine and coastal deliberation research in recent years denotes numerous important social science efforts in marine and coastal studies. On the other hand, marine research collaborations in Africa, Asia, and South America are very much underdeveloped (Syed et al., 2019; Tolochko and Vadrot, 2021).



The findings of this review are useful to contrast with those from Banerjee (2022), in regards to the problem framing and the potential role of deliberation in addressing current issues in coastal natural resource governance in the Global South. Banerjee (2022) argues that deliberative democracy in its Western form has failed to normalize differences and facilitate assimilation to solve the ongoing violent conflicts over general natural resource extraction in Africa, Asia, and South America. Therefore, there is a need for alternative deliberation-based approaches that aim for the inclusion of more diverse groups and science-policy integration premised on effective communication, particularly among non-Western countries. Such approaches could better leverage existing cultural practices to improve the reliability of deliberative processes with diverse groups.

There are diverse deliberative conflict-resolution or decision-making processes that have developed in different cultures. Some deliberative processes that have been developed in the West are not appropriate in some contexts (Merry, 1987). For example, cultural and political challenges may arise if such processes are expected to be founded on rational discourse separated from the individual (Renn, 2006; Fisher et al., 2011), or are implemented in areas where relationships are inseparable from the individual identity (Graeber, 2001). A Western scientific basis that presupposes separating ideas from people and relationships, and the Habermasian ideal of rational discourse to openly voice ones' views so they can be transparently discussed may be familiar to Western advocates but misaligned with non-Western local values and practices (Habermas, 1987). Hence, the implementation of marine and coastal deliberation research and practice could, for example, better consider the grounded political culture in the location of the studies rather than Western-centric orientations (Min, 2014). The challenges and opportunities for enabling effective deliberative processes can be highly context-dependent, hence collaborative research partnerships are important to gain local knowledge about that context (Carpini et al., 2004; Stefanoudis et al., 2021). For example, the practice of "Musyawarah", a traditional and customary practice of decision-making in Indonesia has a strong influence on social norms for conducting deliberation (Kawamura, 2011). In Indonesia, expressing disagreement in public should be avoided, as a result, the process of intensive lobbying among participants is conducted behind the scenes along with the process of Musyawarah. In this example, researchers or practitioners interested in engaging with Indonesian deliberative practices could follow and integrate the process into existing "Musyawarah" practices that already exist within local communities. There are, however, more general principles for facilitating deliberation practices such as reviewed best practices for improving stakeholder engagement (Reed, 2008).

4.2 Methods used for deliberation in marine and coastal case studies

Methodologies for studying deliberation are varied. The majority of researchers actively participated in the design and organization of the processes. However, there is a lack of mixed-method approaches, although a growing body of literature now shows that understanding of complex problems in marine and coastal sectors requires integrating

multiple sources of data from different perspectives (Benham and Daniell, 2016; Fujitani et al., 2018; Partelow et al., 2020b).

Who the participants of deliberation processes are is critically important for both research and practice. For example, the presence of researchers can influence the participant's behavior during the deliberation process due to power imbalances, lack of trust or the desire of participants to fulfill the perceived goals of the process (Franke and Kaul, 1978; Partelow et al., 2019). As many researchers were active participants in the deliberation processes of their studies, data shows that researchers are interested in the participatory process (e.g. deliberation) and science-policy integration. However, researchers need to consider the above implications of their participation on other participants and the overall process.

The rise of transdisciplinary research agendas in marine and coastal sectors further reflects the need for more research at the science-society interface, such as knowledge co-production (Lemos et al., 2018; Norström et al., 2020; Chambers et al., 2021). Deliberative approaches have been shown to more effectively account for differences and uncertainties among stakeholders and they can play an important role to ensure normative goals related to the ethics of governance (Caniglia et al., 2023). Therefore, they should be incorporated into the decision-making process. Transdisciplinary research presents a valuable opportunity to embed deliberative approaches through the integration of different scientific disciplines and non-scientific knowledge, which has been shown to strengthen sustainability governance processes and outcomes for coastal communities and decision-makers when effectively and ethically conducted (Pereira and Funtowicz, 2006; Benham and Daniell, 2016).

Although we did not look explicitly at partnerships and collaborations in our review data, our examination and knowledge of the case studies examined suggests that most researchers established collaborations with other stakeholders to organize deliberation processes. Collaboration with, and inclusion of, various stakeholders in the production of knowledge and solutions to governance problems can help ensure that decisions are grounded and applicable to the context (Bello et al., 2018; Bennett, 2018). Moreover, the review shows researchers take more active roles in moderating the deliberation process rather than using professional facilitators or experts. Professional facilitators, however, can be essential to encourage co-learning across stakeholders, including practitioners and researchers (Page et al., 2016). The presence of more neutral experts or professional moderators may help reduce potential power imbalances across the participants and other negative effects of science-led processes mentioned above (Sanders, 1997) and for this reason, experienced professional moderation has been emphasized as an element for success in other reviews of participatory processes (Carpini et al., 2004; Reed, 2008).

4.3 Recommendations for deliberation in marine and coastal case studies

The majority of case studies recommended deliberation as a part of participatory decision-making processes for governance or management. This is likely because public participation to inform environmental policy-making in these regions is legally mandated

in the USA and Europe (US National Environmental Policy Act, 1969; Aarhus Convention, 2003). Thus, government resources are devoted to the study, formulation of guidelines, and implementation of participatory processes. In the analysis based on country, there are differences in the underlying political systems between deliberation processes at the local level in the USA and countries within the European Union. The deliberative democratic processes culture in the USA manifests as local-level deliberation in various public venues such as informal lawn parties, official school councils, and public hearings (Levine et al., 2005), including churches (Neiheisel et al., 2009). The deliberation approaches established among communities in the USA are also varied such as deliberation polling, citizen assemblies, citizens' juries, and consensus conferences (Fishkin et al., 2021). In the USA, informal meetings could have a deliberative quality that influences decision-making (Bächtiger et al., 2018).

Meanwhile, public engagement in decision-making founded on deliberative democratic theory (Habermas, 1962; Habermas, 1985) is highly constrained by traditional modes of government in Europe, as argued by Hagendijk and Irwin (2006). This is due to the political organization of the European Union with a nested hierarchy of intergovernmental bodies that emphasize high-level policy coordination (i.e., multi-level governance) among its members for collective decision-making that is different from the USA deliberative governance (Puetter, 2012). In addition, most European citizens have low participation beyond voting in EU decision-making due to the lack of involvement mechanisms in the consultation process (Alemanno, 2022).

The scope of the above recommendations identified in this review varied. The majority of the case studies recommended deliberation to enhance participatory governance/management and science-policy integration. In the marine and coastal sectors, deliberation to enhance participatory governance/management has been, for example, well adopted into the design of marine protected areas (MPAs) as mandated by the Convention on Biological Diversity (CBD) (Stafford, 2018). Despite the increasing number of studies connecting deliberation processes and participatory approaches, deliberation is not always a mandatory practice in resource management and governance, including for MPA governance (Rasheed and Abdulla, 2020). As such, the failure of some MPAs has been attributed to the absence of deliberation processes in the initial management design (Chuenpagdee et al., 2020). This challenge is often enhanced in coastal systems - compared to terrestrial resource management - due to the complexity of different stakeholders and interests on the coast that mandate the consideration of a broader range of social, cultural, economic, and ecological objectives (Ranger et al., 2016; Schlüter et al., 2019; Schlüter et al., 2020). In other words, deliberation alone is not a panacea, and the outcomes of deliberative processes and how they can be translated into policy is highly context-dependent. If not designed properly, deliberative processes could become 'listening sessions' without meaningful adoption into policy. Thus, the recommendations from the case studies indicate the need to use deliberation effectively, early in the process, and the flexibility to moderate public values and expert assessments as well as adjust policy responses to enhance the participatory approach in the marine and coastal sectors.

Moreover, there is a growing interest from the scientific communities to collaborate with policymakers to solve the wicked policy issues in marine and coastal governance (Claudet et al., 2020; McKinley et al., 2020). A science-policy integration can bridge various forms of scientific expertise and public policy processes by facilitating deliberation to understand better the available policy options and practical implications of decisions or policies for the environment and society (Kowarsch et al., 2016). In the context of marine and coastal governance, interdisciplinary knowledge exchange of various fields of science and policy should enhance collaboration to protect and restore marine ecosystems based on the values of diverse stakeholders (Oosterwind et al., 2016).

4.4 Study limitations

There are limitations to our review that require brief reflection on the trade-offs of the methodology and interpretation of the resulting data. We sourced our case studies from peer-reviewed journal articles published in English. On one hand, we aimed to gather a replicable and understandable sample of research to analyse the trends, opportunities, and challenges in the field. On the other hand, we are aware that there are many articles from the grey literature in English and in other languages in the peer-reviewed science (e.g. government, non-governmental studies, theses, and dissertations) that have been excluded. Focus on the English language literature allows consistency and replicability, and is more feasible given the limited resources such as co-authors who would be needed with fluency in each language that could be included. We encourage future studies to consider examining a broader scope of the literature, as well as to consider collecting more detailed data on author and study locations, emerging discourses in the field, connecting with other concepts (e.g., broader participatory governance literature), or linking to specific policy approaches in focused countries or regions. We nonetheless encourage critical and constructive feedback on this research, which we view as a baseline assessment of the field going forward.

5 Conclusion

Deliberation is an increasingly important concept for governance practice and research methodologies, which includes how problems are framed and prioritized. Our systematic review provides a needed baseline for understanding the research trends on deliberation in marine and coastal governance systems. In general, our results indicate that peer-reviewed research about deliberation processes has been increasing and encouraged with a variety of problem framings, methodologies, and recommendations. Study locations and author locations are unevenly distributed, dominated by scholars in the global north. Most case studies used deliberation in the recommendation to advance participatory governance, and most of the researchers actively participated to solve real-world problems by creating deliberation processes. In addition, recommendations from case studies indicate that deliberation processes are often designed and implemented with considerations for context-dependence,

incorporation of diverse viewpoints while moderating for power hierarchies, and early enough in participatory governance/management processes to shape policy outcomes and science-policy collaborations. We believe our findings provide a necessary baseline of current trends to guide future researchers and practitioners engaged with deliberation, which is an essential element of participatory governance and management approaches in marine and coastal systems.

Data availability statement

The original contributions presented in the study are included in the [Supplementary Material](#), further inquiries can be directed to the corresponding author.

Author contributions

AP, SP, and MF contributed to conception and design of the study. AP organized the database. AP performed the statistical analysis. AP wrote the first draft of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fmars.2023.1178453/full#supplementary-material>

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