

Review

## Collaborative governance in marine and coastal management: A systematic review

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### ABSTRACT

Strengthened collaboration across different levels of governance can lead to improved marine and coastal management outcomes. For example, collaborative governance can improve coordination between institutions and communities, enhance trust to facilitate the participation of diverse actors, and build capacity for shared decision-making among both state and non-state sectors. While interest in collaborative governance for marine and coastal systems is growing, critical gaps in the scholarship remain, particularly regarding its implementation and success. Systematically identifying these knowledge gaps is essential to guide future research efforts and funding investments. To address this, we systematically reviewed empirical case studies, examining the roles of actors, the barriers and opportunities to collaboration, and the outcomes reported. We applied qualitative thematic analysis to identify key themes across the studies. A total of 4196 articles were retrieved from literature databases, and after a multi-stage screening process, 60 articles qualified for inclusion in the systematic review. We find that while collaborative governance involves a diversity of actors in marine and coastal settings, power remains unevenly distributed, often concentrated within the state. Our findings further highlight that essential conditions for supporting and sustaining collaborative governance include power sharing, legitimacy, engagement with bridging actors, and access to financial resources. Finally, we emphasise the need for standardised approaches to evaluating both social and ecological outcomes. This review contributes a roadmap for advancing collaborative governance research in marine and coastal contexts and offers recommendations to better align theory with practice.

### 1. Introduction

Marine and coastal environments are vital for human well-being and prosperity (Nash et al., 2022). For example, they play a critical role in sustaining livelihoods, providing food security, and protecting coastal communities from physical threats, such as storms (Jouffray et al., 2020; Mendler de Suarez et al., 2014; Spalding et al., 2014). However, these environments face increasing threats from anthropogenic pressures, including climate change, resource exploitation, and coastal development (Halpern et al., 2008; IPCC et al., 2023; Mendler de Suarez et al., 2014; Ullah et al., 2022; Nash et al., 2017). For example, declining biodiversity, reduced fish stocks, and lower catch potential threaten

livelihoods and food security, often exacerbating conflicts among users (Kourantidou et al., 2022; Pomeroy et al., 2016; Ullah et al., 2022). These challenges are worsened by resource competition, governance disputes, and inequitable policies, leading to social exclusion and environmental harm (IPCC, 2022; Pomeroy et al., 2016; Samonte et al., 2014; Ullah et al., 2022). Effective and equitable marine resource governance is thus critical for both human and ecological well-being (Bennett et al., 2021).

However, in most contexts historically, marine and coastal governance approaches have minimal participation from local fishers and other resource users (Ferse et al., 2010; Innes and Booher, 2004; Jones, 2012; Schreiber, 2001) and instead focused on top-down and

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hierarchical processes. These approaches adopted a generalised view of human–nature interactions, overlooking local context and knowledge (May 2012; Rist et al., 2007). This can lead to resistance and criticism from local communities, which can disrupt management outcomes (Agrawal and Gibson, 1999; Wood and Gray, 1991; Zikargae et al., 2022). For example, a study on integrated marine governance in Ireland found that excluding local communities from planning processes undermines legitimacy, erodes trust, and results in uneven trade-offs, such as biodiversity loss (Kelly et al., 2019). To address these limitations, scholars and practitioners have called for more interactive and collaborative approaches to marine and coastal governance that allow for a more grounded and nuanced understanding of the socio-ecological systems in their entirety, and their interrelations at various levels (Berkes, 2004; Gelcich, 2014).

In response, a growing shift toward bottom-up approaches to marine and coastal governance (Armitage et al., 2009; Driessen et al., 2012; Gelcich et al., 2010; Pomeroy and Douvère, 2008; Slunge et al., 2012), which emphasise inclusivity and multi-level interactions (Agrawal et al., 2022; Koontz, 2006; Lemos and Agrawal, 2006), has been apparent. Collaborative governance (CG) refers to decentralised, multi-actor decision-making processes where different levels of government, communities, and civil society collectively achieve goals that could not be accomplished by individual actors alone (Ansell and Gash, 2008; Bryson et al., 2006; Emerson et al., 2012). It involves voluntary and formalised partnerships among diverse actors working to understand shared problems, such as in resource management, and devise collective solutions, enabling more sustainable outcomes (Emerson and Nabatchi, 2015; Selin and Chevez, 1995; Wood and Gray, 1991). For example, a study on marine resource management in the Philippines highlighted that the shift from centralised control to collaborative governance (CG) and decision-making between local communities and government levels empowered fishers and contributed to successful marine management (Alcala and Russ, 2006). Adopting a CG approach has also been shown to support conflict resolution between fishers and government actors (Sen and Nielsen, 1996). These examples demonstrate the value of decentralised, collaborative approaches in achieving more inclusive and effective marine and coastal governance.

The marine and coastal domain is particularly well-suited for examining CG due to the complexity of these environments and their vulnerability to dynamic changes driven by human activities, climate change, and resource depletion (Craig and Ruhl, 2010). Governance in these contexts can be effective if it is adaptive and responsive, which can be possible through a bottom-up, multi-actor approach that fosters participation, a central feature of CG (Jentoft et al., 2007; Ostrom, 1990). No single actor holds all the knowledge and skills; thus, coordination is needed among national agencies, local governments, non-governmental organisations (NGOs), and resource-dependent users, such as small-scale fishers (Berkes, 2009, 2010; Jentoft, 1989, 2000; Pomeroy and Douvère, 2008). Applying CG in the marine and coastal setting helps ensure that diverse perspectives are incorporated into decision-making and that power is more evenly distributed, preventing any single actor from dominating the process (Gash, 2022). This empowers all actors through enhancing ownership of the governance initiative and strengthening long-term sustainability.

While CG has been proven valuable in marine and coastal governance, the terminology has predominantly been shaped within broader environmental and natural resource management contexts. Empirical studies have focused on areas such as climate change and disaster resilience (Avoyan et al., 2024; McNaught, 2024), natural resource management (Head et al., 2016; Hossu et al., 2018), and interconnected resource systems (e.g., food-energy-water nexus) (Jones and White, 2022), among others. Recent conceptual papers and systematic reviews have similarly focused on natural resource management (Carr Kelman et al., 2023; Feist et al., 2020; Koontz et al., 2019; Ulibarri et al., 2023). Although this list is not exhaustive, it highlights significant gaps in the literature on CG in marine and coastal contexts, particularly that our

understanding of CG arrangements remains limited, and existing evidence is fragmented and lacks a comprehensive synthesis.

For example, there is a need for a deeper understanding of the actors, the roles they perform, and the barriers and opportunities they encounter in CG. Doing so can offer insights into inclusivity in CG (Ansell et al., 2020) and help identify where power imbalances occur (Weiand et al., 2021). Moreover, given the dynamic nature of CG, further research is needed to examine its outcomes and performance (Koontz et al., 2019; Ulibarri et al., 2023; Voets et al., 2021). Exploring actors and their roles, barriers and opportunities, and outcomes can also lead to more grounded and effective CG in research, policy, and practice, particularly in the marine and coastal settings.

In this paper, we seek to address these gaps by undertaking a systematic review of the empirical evidence to date on CG in marine and coastal management. Specifically, in this paper, we address three questions: 1) Who are the key state and non-state actors involved in CG in marine and coastal settings, and how do they differ in their responsibilities and authority within CG arrangements? 2) What barriers limit the actors' ability to collaborate, and what opportunities enhance their capacity for effective collaboration? and 3) What social and ecological outcomes emerge from CG in marine and coastal settings? In doing so, our review examines the extent to which CG practice reflects the established theories (i.e., is CG achieving its promise in practice?). The main contribution of our paper is to provide a current and comprehensive understanding of CG, identify theoretical aspects that may have been overlooked in practice, and ultimately offer a roadmap for advancing the field.

We note that while the term “collaborative governance” is a broad, cross-sectoral concept that is frequently applied in natural resource management, its use in marine and coastal settings remains relatively limited. In this review, we adopt an inclusive approach by also referring to related, more sector-specific terms, such as co-management and community-based management, which are well-established in the marine and coastal governance literature. Collaborative governance involves multi-actor decision-making, including government, non-government, community, and private actors (Ansell and Gash, 2008), in contrast to community-based management, which primarily emphasises local communities and their knowledge and practices, and co-management, which centres on negotiated sharing of authority between government and local communities (Carlsson and Berkes, 2005; Pomeroy, 1995). Although these concepts are distinct, they share a core focus on devolving authority to local institutions and facilitating collective decision-making among diverse actors, particularly between state and non-state groups (Berkes, 2010). Therefore, we treat these concepts as overlapping in research and practice.

## 2. Methodology

To answer the research questions outlined in Section 1, we conducted a systematic review. Systematic reviews aim to rigorously search for, assess, and synthesise research evidence using established protocols (Grant and Booth, 2009). This review method is growing in CG research, particularly in other environmental contexts (Carr Kelman et al., 2023; Feist et al., 2020; McNaught, 2024), as well as in marine policy and practice more broadly (Karcher et al., 2024b). Adopting a systematic approach in this review ensures transparency, replicability, and comprehensive insight (Booth et al., 2016). We combined two methods in this review: the ROSES (RepOrting standards for Systematic Evidence Syntheses) guidelines, a framework for transparent and consistent reporting of systematic reviews in environmental management and conservation (Haddaway et al., 2018) (Fig. 1), and the PSALSAR framework for systematic reviews in environmental studies (Mengist et al., 2020) which includes six steps: 1) Protocol, 2) Search, 3) Appraisal, 4) Synthesis, 5) Analysis, and 6) Report, as detailed in the following sections (Appendix A, Table A1).

## ROSES Flow Diagram for Systematic Reviews. Version 1.0

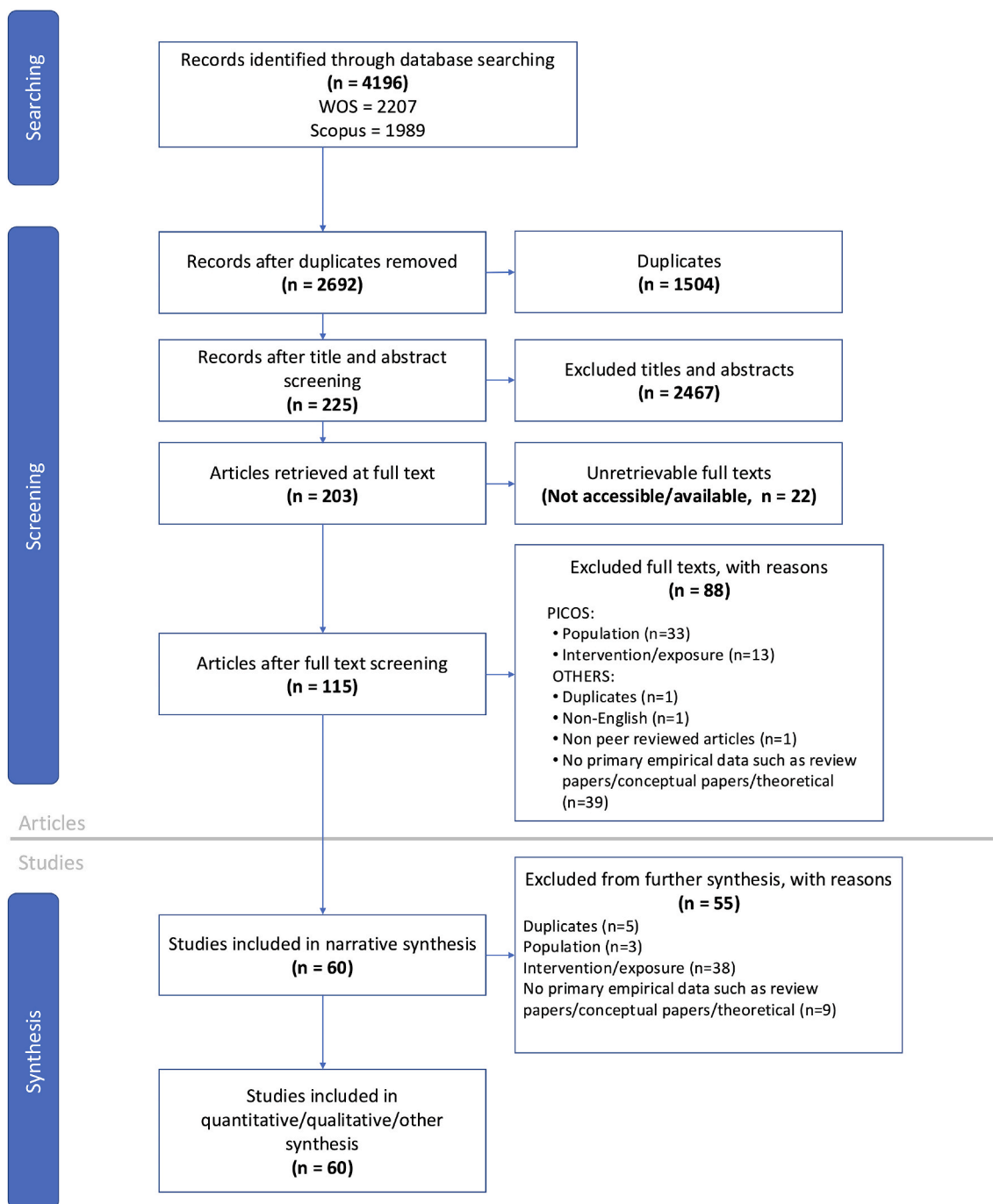


Fig. 1. ROSES diagram of our systematic review outlining the process. A total of 60 studies were included in the review. The screening was conducted from October to November 2025.

### 2.1. Define the scope

To determine the scope of the study, the review followed the Population, Intervention, Comparison, Outcome, and Study type (PICOS) framework (Mengist et al., 2020; Methley et al., 2014). An extension of the PICO framework, PICOS is widely used to structure research questions and is particularly effective when comprehensive searches are not feasible, offering a balance between sensitivity and specificity (Booth, 2016). The tool was mainly chosen to accommodate all types of research designs (i.e., qualitative, quantitative, and mixed) and structure search terms around core concepts (Methley et al., 2014).

### 2.2. Search

To identify relevant studies for this review, we conducted a systematic search using Scopus and Web of Science (WoS), two internationally recognised databases with extensive coverage of peer-reviewed literature. These databases were chosen for their robust indexing of multidisciplinary research, which is critical for examining CG within marine and coastal contexts (following Cvitanovic et al., 2025; Karcher et al., 2021). Initial terms were drawn from two key categories:

- 1) Population of interest – studies related to marine and coastal environments
- 2) Intervention of interest – CG and related forms, including co-management and community-based management.

Following Carr Kelman et al. (2023), only the Population and Intervention components were applied in the search strings (Appendix A, Table A2). Keywords related to CG were drawn from recent CG systematic reviews (Carr Kelman et al., 2023; Feist et al., 2020), while those on marine and coastal contexts were adapted from Eger et al. (2021) and Ison et al. (2024). Related terms, including community-based management and co-management, were incorporated into the search to ensure comprehensive coverage of relevant literature. Initial pretests were conducted in September 2024 to ensure the correct use of Boolean strings. The final search string was identified in October 2024 as a result of an iterative testing process. We repeated our search for about a month before starting the culling process to ensure representative coverage of literature (Booth et al., 2016). The list of all keywords, trials, and search dates is available in Appendix B, Table B1.

### 2.3. Selection of papers

To ensure a transparent and systematic selection of relevant studies, we applied inclusion and exclusion criteria (Grant and Booth, 2009). These criteria helped exclude articles and ensured that included studies aligned with the review scope and objectives. Only peer-reviewed empirical studies with primary data, in English, focusing on CG in marine and coastal contexts, were considered. Although the search retrieved papers using terms such as community-based management and co-management, we only retained those that explicitly examined collaboration between state actors (e.g., government) and non-state actors (e.g., local communities, private sector, NGOs), in line with the predefined selection criteria. For instance, studies focusing solely on community perspectives or experiences, without considering collaborative processes with other actors, were excluded during the title and abstract screening stage. The full list of inclusion and exclusion criteria is provided in Appendix C, Table C1.

The systematic search covered the full range of available records, from database inception to October 10, 2024. While no start date was specified, the search retrieved articles published as early as 1974. A total of 4196 articles were retrieved from Scopus and Web of Science and imported into CADIMA, a web-based tool for managing systematic reviews. CADIMA was used to identify and remove duplicates, sort entries, and support quality assessment. Duplicates were automatically removed, with 1500 entries manually reviewed to ensure accuracy. One author conducted a screening of titles and abstracts to exclude articles that did not meet the inclusion criteria. This resulted in 225 articles progressing to full-text screening. Following full-text screening, 115 articles met the criteria for inclusion in the synthesis. These articles were exported from CADIMA in .xlsx format and analysed in Microsoft Excel. Under the ROSES guidelines, an Excel file was used to conduct a final screening, confirming that all selected studies adhered to the inclusion and exclusion criteria and addressed the review questions. This final step yielded 60 articles for synthesis and analysis (Fig. 1). For a final list of articles, see Appendix D.

### 2.4. Synthesis and analysis

The synthesis phase involved extracting and coding relevant data from the selected studies to derive insights aligned with the review objectives (Mengist et al., 2020). Data extraction focused on both descriptive and qualitative information (see Appendix E, Table E1 for data extraction details).

Although not included in our review objectives, we collected descriptive data on study characteristics to gain additional understanding of the context. Data such as publication year, study site,

research design (i.e., qualitative, quantitative, or mixed), data collection method, and management context were tabulated for all 60 studies. Two additional columns identified CG actors and their roles, directly addressing Objective 1 (actors and roles). To support this process, ChatGPT 4.0 by OpenAI was used to assist in identifying actor information, particularly in studies where roles were not explicitly stated, and then validated through manual checking of the relevant sections. Data were analysed using basic descriptive statistics (e.g., frequencies) in both Microsoft Excel and R.

All full-text studies were then imported into NVivo 20 for thematic analysis to address Objective 2 (barriers and opportunities) and Objective 3 (outcomes). We used thematic analysis, adapting key principles outlined by Braun and Clarke (2006). First, semantic codes were generated by reading the full texts and identifying explicit mentions of barriers, opportunities, and outcomes, based on definitions outlined in the protocol. Second, codes were sorted under each concept and grouped into potential themes. Third, themes were reviewed and refined through a combined inductive–deductive process (Braun and Clarke, 2021). This iterative approach ensured coherence within themes and clear alignment with the research objectives. Initial coding was conducted by one author, with the themes subsequently decided and validated through consensus among three authors.

### 2.5. Study limitations

The systematic review has several limitations related to search strategy, study selection, coding, and inclusion criteria. The search string was not exhaustive, though related terms such as co-management and community-based management were included to minimise the risk of missing relevant studies. Potential bias in the study selection and coding was addressed through discussion and consensus among the authors. The review was restricted to English-language, peer-reviewed journal articles with primary empirical data, which may introduce publication bias by excluding studies in other languages or formats such as books, theses, or reports. While we aimed for a comprehensive review, applying strict criteria was intended to ensure a manageable and focused study that aligns with our scope and objectives. Consequently, some relevant studies on collaborative governance in marine and coastal contexts may not have been captured.

## 3. Results

The 60 studies included in this review were published between 1993 and 2024, with the majority (77 %) published between 2015 and 2024 (Fig. 2). These studies covered 74 study sites across six continents. Europe (n = 20) and Asia (n = 17) were the most represented, accounting for over half of all the sites (50 %), followed by North America (n = 14), South America (n = 11), Africa (n = 8), and Oceania (n = 4). One study covered two countries on different continents (i.e., Italy and Brazil), while two studies covered multiple European countries (Fig. 3). Detailed results on research design, data collection, and management context or approach are provided in Appendix F (Figures F1, F2, and F3).

### 3.1. Actors and their roles in CG

A wide range of actors were identified across the 60 empirical studies (Appendix G, Table G1), with varied roles (Appendix G, Table G2). The most frequently mentioned actors were the government, community, and civil society organisations (CSOs).

Within the government category, national-level agencies were the most prominent (n = 59). These agencies regulate and enforce fisheries laws and policies, lead decision-making processes, mediate conflicts, and provide technical and financial support. In contrast, commune or village councils were mentioned less frequently (n = 7). Their roles include engaging fisherfolk, supporting compliance, and enforcing local regulations.

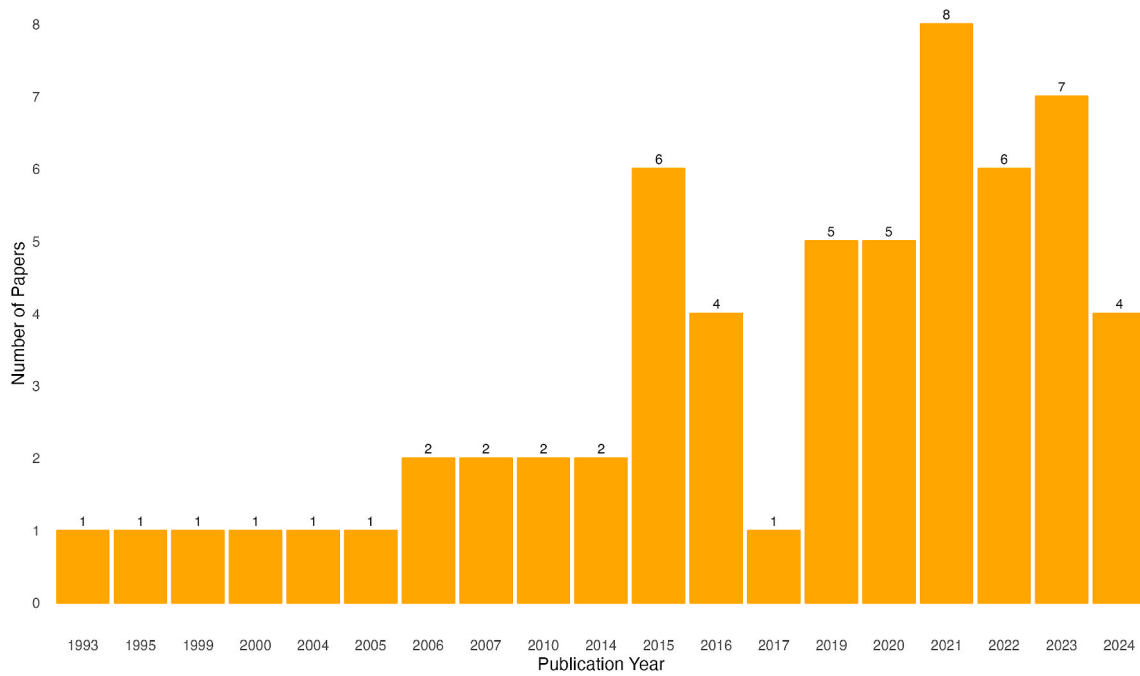


Fig. 2. Year of publication for the 60 studies on CG in marine and coastal contexts. As the literature search was conducted in October 2024, the dataset may underrepresent studies published in the latter part of that year.

### Study Location by Continent

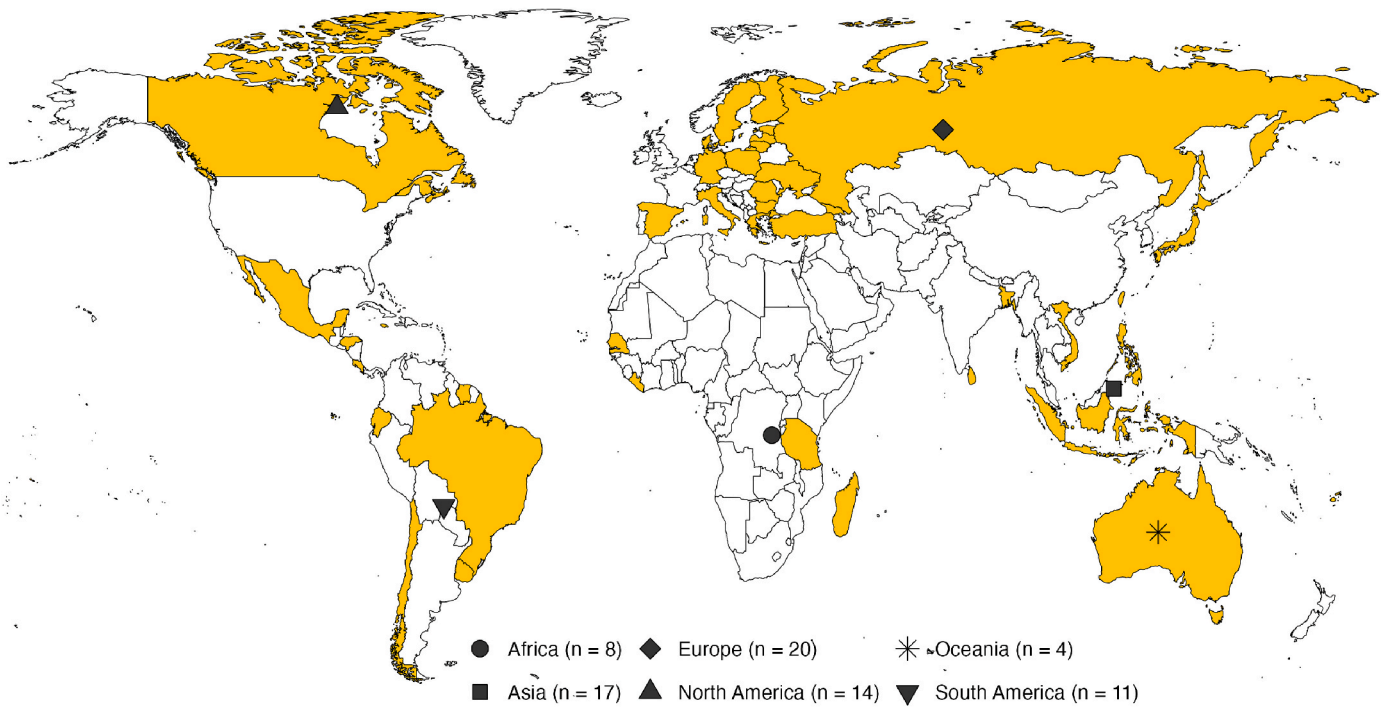


Fig. 3. Locations of the 60 studies on CG in marine and coastal contexts. Three studies included multiple sites, resulting in a total of 74 locations. Two focused on transboundary governance across several European countries, while one covered two countries on different continents.

Among community actors, fishing communities were the most cited (n = 36), followed by other residents or resource users (n = 7), indigenous groups or communities (n = 5), and community leaders (n = 5). These actors contribute local knowledge, advocate for traditional practices, support enforcement efforts (e.g., collaborating with fisher associations to patrol resources), and report illegal activities.

The CSOs were also featured prominently. Big international NGOs (BINGOs) and development NGOs (n = 35) were the most cited, typically providing capacity-building, technical support, financial assistance, and environmental advocacy. Grassroots CSOs, often referred to as community-based organisations (n = 22), represent local communities, promote indigenous knowledge, and support enforcement at the

village level. Both groups often act as intermediaries between communities and government institutions. Less frequently mentioned were networks, coalitions, social movements, and faith-based CSOs ( $n = 11$ ), which shared similar roles with international and development NGOs.

International organisations, particularly external funders or donors ( $n = 11$ ), were the least mentioned. Their primary roles included providing financial support for marine conservation projects and assisting with capacity-building efforts.

Finally, collaborative committees or working groups ( $n = 28$ ) were also identified as key actors. Since they comprise representatives from the government, community, and CSOs, they do not fall under a single category and are listed separately. These committees (e.g., co-management committee) play a central role in establishing collaborative platforms, facilitating multi-actor decision-making, and ensuring coordination between state and non-state actors, making them vital to CG processes.

### 3.2. Barriers in CG

A total of eight barrier categories and 18 sub-categories were identified across 55 out of 60 papers (Appendix G, Table G3). The most frequently cited barriers fell under power asymmetry, particularly tokenistic engagement ( $n = 22$ ) and low participation of non-state actors ( $n = 21$ ). Resource constraints also emerged as a major challenge, notably lack of funding and personnel ( $n = 24$ ), followed by poor coordination and communication, often due to inefficient institutional approaches ( $n = 12$ ), and non-compliance with rules, particularly fisher violations ( $n = 11$ ). Conflicts over property or user rights, especially competition for resource access and use ( $n = 11$ ), and a weak legal framework, specifically the absence of legal authority for collaborative arrangements, were also reported ( $n = 11$ ).

The least frequently mentioned barriers were related to monitoring and enforcement, such as elite capture ( $n = 2$ ), and non-compliance with rules, particularly poor socio-economic conditions ( $n = 3$ ).

### 3.3. Opportunities to CG

A total of six thematic categories and 14 sub-categories of opportunities were identified across 53 out of 60 papers (Appendix G, Table G4). These factors represent key drivers for enhancing and sustaining collaboration among actors.

Human and social capital emerged most prominently, particularly the presence of social networks ( $n = 36$ ), commitment among actors ( $n = 15$ ), and strong leadership ( $n = 11$ ). Other frequently cited opportunities included effective communication and engagement, such as regular and localised meetings ( $n = 17$ ), recognition of local communities and their contexts, notably through the integration of local knowledge and customs ( $n = 14$ ), and legislative support, specifically in the form of legal agreements and policies ( $n = 13$ ).

Less frequently mentioned were capacity building ( $n = 6$ ), resource support through incentives ( $n = 6$ ), the formation of committees or working groups ( $n = 5$ ), followed by the inclusion of women ( $n = 4$ ), clearly defined boundaries ( $n = 3$ ), and shared identity and sense of responsibility ( $n = 3$ ).

### 3.4. Outcomes of CG

The outcomes reported across the studies were categorised into social, ecological, and implementation outcomes, following Koontz et al. (2019) (Appendix G, Table G5). Of the 60 studies, only 31 explicitly reported outcomes of CG. Positive social outcomes were the most frequently cited, particularly community empowerment ( $n = 12$ ), knowledge sharing and learning ( $n = 7$ ), enhanced social capital ( $n = 7$ ), and conflict resolution ( $n = 5$ ). Positive ecological outcomes were also reported, most notably perceived increases in fish populations ( $n = 7$ ). Negative outcomes were rarely mentioned. These included negative

social outcomes, such as dissatisfaction with results ( $n = 2$ ), and negative ecological outcomes, such as perceived lack of improvement or decline in fish populations ( $n = 3$ ). Implementation outcomes were also documented, specifically policy-related impacts ( $n = 5$ ) and improved monitoring and rule enforcement ( $n = 4$ ).

## 4. Discussion

Our review of 60 empirical studies revealed that CG in marine and coastal settings involves diverse actors, including government agencies, CSOs, and community members, each playing different yet crucial roles. We also found that power asymmetries and weak institutional support limit the effectiveness of CG in marine and coastal settings. In contrast, we observed that the presence of bridging actors (i.e., intermediaries), the legal authority of local groups, and effective communication between actors facilitate collaboration. Finally, we found that CG research to date has focused more on social than ecological outcomes, with few studies using standardised measures to assess the relationship between CG and its outcomes. In the following sub-sections, we discuss these key findings and their practical implications for CG in marine and coastal contexts.

### 4.1. Actors and roles in collaborative governance

One of the key findings from this study was the importance of national-level government actors who serve as convenors in CG and retain primary decision-making authority (e.g., Alexander et al., 2015; Bausero-Jorcín et al., 2024; Cox et al., 2020). For example, governments managed marine extractive reserves, positioning them as central actors upon whom others depended (Fortunato et al., 2024). This supports earlier claims in the literature that, while collaboration is encouraged, the state often retains final authority since it holds the legal and institutional power to lead negotiations, apply regulatory standards, enact legislation, and legitimise other actors (Brewer and Moon, 2015; Koontz, 2006; Pomeroy and Berkes, 1997; Tuda et al., 2021; Wondolleck and Ryan, 1999). However, we also found that centralising decision-making can constrain power-sharing, limiting meaningful participation by non-state actors. This reflects the ongoing tension in CG between inclusive participation and state control, a dynamic that often hinders the effectiveness of marine and coastal resource management (Masud, 2019).

In addition to state actors, the findings in this review indicate that CSOs and fishing communities play substantial roles in the collaborative processes. For instance, grassroots CSOs or community-based organisations commonly represent fisher perspectives, ensure that community voices are heard (Druon et al., 2023; Sukuryadi et al., 2021), and contribute to enforcement by overseeing compliance with local fisheries regulations at the village level (Chávez Carrillo et al., 2019; Islam et al., 2020). Both grassroots CSOs and development-oriented NGOs (including BINGOs) act as intermediaries, facilitating communication and implementation between local communities and government agencies (Colbert-Sangree and Suter, 2015; Galappaththi and Berkes, 2015; Levine, 2016). Our findings, therefore, confirm previous work suggesting that CSOs enhance collaboration by raising awareness, connecting actors, and advocating for context-specific policies (Brewer and Moon, 2015; Jentoft, 1989; Margerum, 2011).

Across the sampled CG literature that comprised this review, the inclusion of community members has also been documented. For example, fishing communities contributed by sharing traditional ecological knowledge, participating in rule co-development, and engaging in enforcement activities such as patrolling and peer monitoring (Bausero-Jorcín et al., 2024; Granek and Brown, 2005; Livingstone and Anthony, 2023; Quimby et al., 2023). Only five studies mentioned indigenous groups and grassroots leaders, which may suggest insufficient documentation of indigenous-led governance. This aligns with previous literature asserting that despite calls for inclusivity, a

failure to recognise indigenous context remains a persistent weakness in CG (Ansell et al., 2020; Cadman et al., 2022).

Another key finding was the presence of collaborative committees or working groups in nearly half of the studies (Cox et al., 2020; Haque et al., 2022; Islam et al., 2020). These groups often serve as platforms for multi-actor decision-making. For example, Local Fishery Councils (LFCs) in Uruguay provided a space for dialogue, conflict resolution, and information-sharing among fishers and state actors (Bausero-Jorcín et al., 2024). The LFC played a crucial role in providing the space for both state and non-state actors to participate in decision-making, resolve conflicts through forums, and share regulatory information. While LFCs promoted inclusion, final authority remained with the state, reaffirming the government's central convening role. These committees align with the findings of Masud et al. (2022), who observed that consultation groups can help close the gaps between government and local actors, thereby supporting the long-term sustainability of coastal management efforts.

Overall, the findings suggest that while CG involves a diversity of actors, power remains unevenly distributed, often concentrated within the state. As previous research suggests, this may be due to the limited capacity or willingness of some actors to assume management roles (Andersson and Ostrom, 2008) or conflicting interests among actors (Agrawal and Gibson, 1999).

#### 4.2. Barriers to collaborative governance in marine and coastal settings

As outlined in Section 3.2, we found that while CG is grounded in the principle of shared decision-making, in practice, power remains concentrated in the state. Decision-making processes are often centralised, with limited involvement of key actors, particularly those most affected and vulnerable, such as women and indigenous communities (Weiand et al., 2021). For instance, governments may use co-management not as a power-sharing mechanism, but as a tool to achieve predetermined objectives, excluding local actors from meaningful participation (Gelcich et al., 2006; Miller et al., 2019). This tokenistic engagement undermines motivation to participate, particularly among small-scale fishers who feel excluded from decision-making and perceive little influence over resource governance (Djosetro and Behagel, 2020; Richard and Pike, 1993). In Hawaii, for example, community members described participation as “more conceptual than practical,” noting that the government had already developed management plans and only informed communities afterwards (Collier, 2020). These findings align with a previous study by Chuenpagdee and Jentoft (2007), who argue that governments, as CG initiators, often dictate both the process and roles of participants. Governments are often reluctant to share authority due to scepticism toward fishers' knowledge and capacity to self-organise, despite the value of local knowledge in complementing scientific data (Pomeroy and Berkes, 1997).

In addition, our findings indicate that power imbalance is not solely the result of state dominance but is also influenced by external actors. As evidenced by the sampled papers, donors and international organisations can also drive agendas that reflect their priorities, sometimes imposing conditions that instrumentalise local partners, such as fishing communities (Levine, 2016; Weiand et al., 2021). While NGOs and donors can provide crucial start-up resources, overreliance on external funding, without state or government support, can be detrimental to sustainability (Katikiro et al., 2024; Livingstone and Anthony, 2023). Once project funding ends, essential activities such as planning, regulatory updates, and rights allocation often discontinue, particularly when governments remain passive (Ho et al., 2016). This is consistent with the findings of Cinner et al. (2012), which emphasised that the transition to marine co-management is donor-dependent. Reliance on donor support, however, can disrupt long-term outcomes by weakening local ownership and exacerbating existing resource constraints (Sen and Nielsen, 1996), such as a lack of personnel and funding (Di Franco et al., 2020). Donor roles should only be limited to supporting

capacity-building efforts for both state and local actors.

Another key insight was that weak legal frameworks can also reinforce power asymmetry in CG. For example, in the Galápagos small-scale fishing sector, the public sector holds a dominant role due to legal authority granted by the Galápagos Special Law, a governance instrument designed to balance development and conservation (Cáceres et al., 2023). Similarly, in Uruguay, the Local Fishery Councils (LFCs) have limited authority, as final decisions rest with DINARA, the national fisheries agency (Bausero-Jorcín et al., 2024). These findings align with previous governance literature, which highlights that when communities lack legal authority, trust in government is weakened, thereby undermining legitimacy (Haugaard, 2022; Laurino et al., 2024; Wood and Gray, 1991). Legitimacy, defined by balanced representation and the perception that actors receive a “fair hearing” in decision-making, is essential for sustaining collaboration (Ansell and Gash, 2008; Emerson et al., 2012; Newig et al., 2018). Without legitimacy, CG arrangements are likely to collapse.

#### 4.3. Opportunities to improve collaborative governance in marine and coastal settings

An important insight from this review was that grassroots CSOs and BINGOs often served as bridging actors (i.e., intermediaries that facilitate multi-directional knowledge exchange and use among actors) (see Cvitanovic et al., 2015), linking fishers and government agencies. These organisations played strategic roles in facilitating collaboration, advocating for community involvement, and guiding local-level decision-making (Collier, 2020; Dunning, 2021; Vaughan and Caldwell, 2015). In the Galápagos, for example, CSOs were identified as influential actors connecting governance scales (Cáceres et al., 2023). This is consistent with previous CG literature that highlighted CSOs as champions (Agronoff, 2012; Crosby and Bryson, 2010). These CSOs often lead and sustain collaboration by helping various actors recognise the value of working together. CSOs act as informal leaders, which is particularly important in contexts where state leadership is absent (Bryson et al., 2006). Thus, our findings suggest that involving CSOs may enhance policy legitimacy and improve local knowledge integration (Mikalsen et al., 2007), particularly given the growing body of evidence that has shown the critical importance of bridging actors for achieving improved outcomes in marine science, policy, and practice more broadly (e.g., Cvitanovic and Hobday, 2018; Karcher et al., 2024a, 2022).

The findings of our review also highlight the relevance of legitimacy, particularly through the granting of legal authority and rights to local actors. For example, in Zanzibar, the Misali Island Conservation Association (MICA), a community-based organisation, was legally granted management authority over the Misali Island Marine Conservation Area (MIMCA), which helped prevent exploitation by outside actors and ensured local access (Levine, 2016). Similarly, in Japan, fishermen's cooperative associations held the exclusive fishing rights, enabling them to determine management strategies suited to their needs (Lim et al., 1995). These examples support previous observations by Pinkerton (2009) that clearly defined access rights and meaningful community participation in decision-making are key predictors of successful CG. Legal agreements, whether formal or informal, help clarify the purpose of collaboration and define roles, responsibilities, and decision-making authority (Bryson et al., 2006), particularly in the initial stages.

Our review also identified that effective communication was another critical enabler of CG in marine and coastal settings. As highlighted in the reviewed studies, regular face-to-face meetings promote information exchange, build trust, and strengthen interpersonal relationships (Druon et al., 2023; Moodie and Sielker, 2022; Rivera et al., 2021). These findings support the broader work of Ansell and Gash (2008), who emphasised that CG relies on direct, consensus-oriented dialogue that fosters mutual respect, shared understanding, and commitment to the process. They also support Cvitanovic et al. (2021), who found that trust is most effectively built between diverse actors through face-to-face

engagement across a range of formal and informal interactions. Communication in the early stages should enable local actors, such as fishers, to organise and express their concerns to state actors without fear of reprisal (Pomeroy and Berkes, 1997). The state, which is usually the initiator of collaborative activities, should then set the tone for meetings and ensure openness to feedback (Chuenpagdee and Jentoft, 2007; Wondolleck and Ryan, 1999). Clarifying the roles of local actors and the influence of their recommendations in policy processes can further encourage their participation, potentially contributing to their empowerment and the sustainability of collaboration (Koontz, 2006).

#### 4.4. Outcomes of collaborative governance in marine and coastal settings

Findings from our study show that while half of the reviewed studies mentioned collaborative outcomes, only a few employed standardised measures to link CG to those outcomes explicitly. These findings align with previous studies suggesting that the relationship between CG and outcomes remains largely underexplored, highlighting the need for clearer frameworks and standardised evaluation metrics across diverse contexts (Avoyan et al., 2024; Bryson et al., 2015; Emerson and Nabatchi, 2015; Koontz and Thomas, 2006; Sen and Nielsen, 1996). Recent scholarship has called for stronger outcomes evaluation in CG (Feist et al., 2020; Gash, 2022; Koontz et al., 2019; Ulibarri et al., 2023), but this remains challenging due to methodological complexity and causal ambiguity (Conley and Moote, 2003).

Our analysis of the outcomes also highlights that CG scholarship in marine and coastal contexts has focused more on measuring social than ecological outcomes. Positive social outcomes, such as community empowerment, knowledge sharing and social learning, social capital, and conflict resolution, were more frequently cited than ecological outcomes (e.g., Ayers and Kittinger, 2014; Njifonjou et al., 2006). These findings are similar to previous reviews on CG and the environment, which highlight the need for improved measurement of ecological outcomes to support policymakers in making evidence-based decisions (Feist et al., 2020; Koontz et al., 2019). Ecological outcomes offer a direct indicator of success in conservation and resource management, and should therefore be prioritised (Koontz, 2006; Koontz and Thomas, 2006). Nonetheless, social outcomes remain vital. Understanding community perceptions, for instance, can help identify appropriate management actions, enhance legitimacy, and sustain local support for conservation efforts (Bennett, 2016; Bennett et al., 2019). This underscores the importance of considering both social and ecological outcomes holistically.

Notably, the findings also highlight that only a few studies reported negative outcomes, indicating possible reporting bias. As McNaught (2024) cautions, collaborative efforts should not be assumed to inherently produce positive results.

#### 4.5. Implications of our key findings

Collaborative governance in marine and coastal contexts is increasingly adopted to bring together state and non-state actors in addressing complex management challenges. These arrangements are often designed to integrate diverse forms of knowledge and to bridge science, policy, and practice. Although research on such approaches has expanded in recent years, grounded understanding remains limited. This review synthesises empirical studies to consolidate current knowledge and identify critical gaps to inform policy and practice, and guide future research.

In this section, we highlight the key findings of the review and their alignment with the CG frameworks and then offer recommendations for practice, policy, and future research in CG within marine and coastal settings. We specifically emphasise key conditions that support and sustain CG, including power sharing, legitimacy, engagement with bridging actors, and the availability of financial resources. We also highlight the importance of standardised measures for assessing both

social and ecological outcomes. We discuss each of these elements in turn.

First, our review highlighted the importance of power sharing as a core principle of CG. Seminal frameworks emphasised addressing power imbalances as a key starting condition (Ansell and Gash, 2008; Bryson et al., 2006, 2015), and part of the system context that shapes collaboration (Emerson and Nabatchi, 2015). However, many of the reviewed studies reported that decision-making authority remains concentrated in state actors, often giving only the appearance of collaboration. As a result, many marine and coastal CG initiatives fall short of the theorised model of shared power between state and non-state actors (Emerson et al., 2012). Nevertheless, there are well-documented cases where authority has been genuinely shared, leading to positive outcomes (e.g., Alcalá and Russ, 2006; Bausero-Jorcín et al., 2024). These cases illustrate that power sharing is achievable, though often reliant on supportive institutional and political conditions.

We recommend that power be considered at the outset of any CG initiative in the marine and coastal setting. The CG initiators, typically the government or external donors, must actively design and facilitate inclusive processes, particularly for grassroots organisations and indigenous communities, and should offer meaningful incentives and benefits (Ansell et al., 2020). True collaboration can only occur when power dynamics are made visible, contestable, and balanced toward empowerment rather than control (Haugaard, 2022). Simply creating spaces for participation is not enough; attention must be given to who participates, how they participate, and the influence they have. This may involve establishing power-sharing mechanisms, such as joint management agreements or memoranda of agreement that define the roles and responsibilities of all actors, as well as collaborative workshops where rules (e.g., fishing regulations, conservation measures) are co-developed. Moreover, policies must address structural inequalities such as gender, ethnicity, and class if authority is to be genuinely distributed (Armitage et al., 2009). By embedding these strategies, collaboration can move beyond symbolic participation to become meaningful and transparent.

While the state plays a vital role in rule enforcement and legal authorisation (Agrawal and Lemos, 2007), ensuring effecting knowledge transfer, and providing support for bridging actors (Rölfer et al., 2024), their role should evolve toward that of a partner, rather than a sole decision-maker. However, careful consideration is still required in sharing decision-making power, since grassroots actors or local communities are heterogeneous. Overlooking this diversity can lead to uneven distribution of power that disproportionately benefits some actors over others (Béné et al., 2009), and can exacerbate existing patterns of inequity (Cinner, 2014; Ward et al., 2018).

Second, our review found that legitimacy remains a challenge in marine and coastal CG settings. Overcoming this challenge is critical, since collaboration is more likely to succeed when actors perceive CG processes as inclusive and fair, and when they have decision-making authority (Bryson et al., 2006; Emerson et al., 2012). Hence, policies and agreements should clearly articulate the decision-making rights, roles, and responsibilities of all actors involved (Bryson et al., 2015; Pomeroy and Berkes, 1997). This can be facilitated through regular, face-to-face communication, which helps build trust and enable shared understanding (Ansell and Gash, 2008). In the early stages, effective communication in both verbal and written forms, preferably in the community's local language, should clarify community rights and the extent to which their input will influence decisions and policy outcomes (Armitage et al., 2011).

Third, it was observed that CSOs play a critical role in CG through bridging government and community. These actors must be tapped since they facilitate dialogue, help actors find common ground, and mediate conflict resolution, which are essential functions for effective collaborative decision-making (Di Franco et al., 2020; Emerson and Gerlak, 2014). Moreover, establishing committees, such as co-management councils or working groups, is another important element found in the

review that supports collaborative decision-making in the marine and coastal setting. These groups provide a platform for continuous interaction and coordination between state and non-state actors (Bryson et al., 2006; Di Franco et al., 2020; Pomeroy and Berkes, 1997) through holding regular and face-to-face forums for networking, problem-solving, knowledge exchange, and mutual learning (Armitage et al., 2011; Cinner et al., 2012). Policymakers and donors can strengthen CG by institutionalising joint advisory platforms, co-management councils, and other collaborative decision-making bodies, while ensuring active engagement of CSOs within marine and coastal governance structures. Integrating these mechanisms may promote continuity beyond project or program lifecycles and improve coordination across different levels of government.

Fourth, many initiatives reviewed in this study relied heavily on external donors, raising concerns about their long-term sustainability. To address this, governments should institutionalise funding and capacity-building mechanisms that promote continuity and strengthen local ownership of collaborative efforts. For example, allocating such support within national marine and coastal management budgets is crucial for reducing reliance on external donors. Funding should encompass all phases of collaboration, from planning and implementation to surveillance and enforcement (Gaymer et al., 2014). Additionally, monetary incentives for participating actors can compensate for their time and effort, enhance inclusivity and actor diversity, and improve overall management effectiveness (Laurino et al., 2024).

Finally, one of the most pressing gaps identified is the lack of systematic outcome measurement in CG research. While many studies report positive effects, such as empowerment or social learning, few use standardised tools or transparent methods. This limits the ability to assess whether CG offers real advantages over other approaches. As Gash (2022) noted, there is no consensus on what should be measured or who should measure it, whether internal actors with contextual understanding or external evaluators with independence. To address these gaps, future CG initiatives should develop evaluation methods that are standardised yet context-sensitive, with a clear and consistent set of core indicators and transparent procedures for measuring outcomes. This can strengthen accountability and provide evidence to guide policies on the effectiveness of CG in sustainable marine and coastal management. Moreover, outcomes assessment should include both ecological and social benefits to gain a holistic understanding of collaborative success (Galvin et al., 2018; Koontz et al., 2019).

## 5. Conclusion

This study examined CG in marine and coastal resource management, drawing on 60 empirical studies to analyse key actors and their roles, barriers and opportunities to collaboration, and the reported outcomes. We found that state actors continue to dominate decision-making processes even though CG frameworks promote shared decision-making among state and non-state actors. This suggests that, while collaboration is intended to be inclusive, decision-making often remains centralised, although there are cases where power is more evenly shared among actors. Nonetheless, CSOs and fishing communities play critical roles in brokering relationships, representing local voices, and supporting local policy enforcement. As such, their formal recognition and strengthened representation in marine and coastal governance are crucial.

In addition, the analysis identified key barriers, including power asymmetry, donor reliance, and weak legal frameworks. In contrast, opportunities such as the presence of bridging actors, leadership, legal authority and rights, and effective communication were identified as important drivers of successful collaboration. These findings reinforce core elements of CG theory but also show significant implementation gaps, particularly in power-sharing. For CG to maintain actor commitment and avoid becoming a symbolic activity, it should challenge existing centralised structures and promote genuine power

redistribution (Ansell et al., 2020). This calls for greater engagement from non-state actors who must be empowered through regular communication, clearer policies, legal recognition, and sustained resource support to participate meaningfully.

Another key finding was the lack of standardised measures to assess outcomes. Despite repeated calls for systematic evaluation, there is currently no standardised approach to assessing CG. This represents a significant gap in both research and practice, limiting the ability to assess CG effectiveness and draw lessons across cases. Among studies that reported outcomes, social outcomes were more frequently discussed than ecological ones, suggesting a need for more integrated evaluation. To achieve a holistic understanding of collaborative success, both social and ecological outcomes must be considered.

Overall, our findings underscore the need for greater attention to the antecedents of collaboration, particularly how power operates to either dominate or empower actors (Haugaard, 2022). This requires careful groundwork to assess existing governance structures in marine and coastal contexts and to determine the viability of a CG approach. Greater attention is also needed to the collaborative roles of underrepresented actors, including women, indigenous communities, commune or village councils, and local CSOs, whose contributions are often overlooked. Moreover, justice is an important area for future exploration since it is a precondition for legitimacy, a concept emphasised in this review. Future research could also investigate how to balance power sharing and whether the initiation phase of CG is best approached from top down or bottom up. In addition, studies should build on the analysis of incentives to examine whether they influence the effectiveness and continuity of collaborations. Finally, evaluations of CG outcomes should combine a consistent set of core indicators with flexibility for local conditions, explicitly addressing both social and ecological dimensions to advance CG theory, policy, and practice.

## CRediT authorship contribution statement

**Ma Victoria Stephane Asio:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Christopher Cvitanovic:** Writing – review & editing, Validation, Formal analysis, Conceptualization. **Jacqueline Lau:** Writing – review & editing, Validation, Conceptualization. **Amy Diedrich:** Writing – review & editing, Validation, Supervision, Conceptualization, Formal analysis.

## Declaration of generative AI and AI-assisted technologies

During the preparation of this work, the authors used ChatGPT 4.0 by OpenAI to assist with improving the clarity and readability of the paper. After using the tool, the authors reviewed and edited the context as needed. All final content is the responsibility of the authors.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

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## Data availability

Data will be made available on request.

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