



## Tides of tension: Exploring the blue economy through stakeholder narrations

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### ABSTRACT

The Blue Economy concept combines the views of oceans and seas as areas of economic growth, industrialization, and development, on the one hand, and as vulnerable marine ecosystems that need to be protected, on the other hand. Drawing on a concept driven by managerial practice in ocean-related industries, national and transnational institutions, and policymakers, this study applies abductive reasoning to explore the tension between these priorities and contribute to a holistic understanding of the Blue Economy. First, we establish the Blue Economy as a transitory research context in studies across multiple disciplines. Second, we describe it using three lenses from interdisciplinary literature: place, development, and sustainability. Third, we ground the Blue Economy in reality, using narrations around these lenses that we extract from data collected during four online workshops with diverse stakeholders. The narrations show how stakeholders deal with the conundrum arising from issues around ownership and control (place), the economic needs of countries and communities (development), and the quest for resilient ecosystems (sustainability). Finally, applying grid-group analysis to evaluate the narrations lays bare stakeholders' antagonistic perspectives. We discuss techno-solutionism, localism, and transnationalism as at least temporarily acceptable responses to competing priorities that embrace the interplay between place, development, and sustainability and may inspire recommendations for policymakers.

### 1. Introduction

The Blue Economy, denoting “the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem” (Vierros and De Fontaubert, 2017, p. 6), has gained currency in debates among policymakers and corporate actors on oceans as promising domains for economic growth and business development, and academic research in multiple disciplines (Bennett et al., 2021; Voyer et al., 2018), such as geography (Mallin and Barbesgaard, 2020), tourism (Phelan et al., 2020), economics (Spalding, 2016), marine policy and ocean governance (Croft et al., 2024; Jarvis and Young, 2023; Voyer et al., 2018), entrepreneurship (Zhu et al., 2023), and circular economy and eco-innovation (Pakseresht et al., 2025). Often described as the ocean-based counterpart to the Green Economy, the Blue Economy is distinguished by its global reach and the shared responsibility of all nations to manage and conserve marine

resources, while also navigating inherent tensions between economic growth and the need for environmental and social sustainability (Jarvis and Young, 2023; Spalding, 2016; Ertör and Hadjimichael, 2020; Lee et al., 2020; Niner et al., 2022; Tabe-Ojong et al., 2025; Voyer et al., 2018). To explore the dual objectives of economic growth and environmental protection, this study asks, *What strategies can be implemented to balance the entrepreneurial and industrial opportunities of the Blue Economy with the need to protect and sustain marine ecosystems?*

Our objective is to contribute to a holistic understanding of the Blue Economy, which plays a vital role in advancing the UN Sustainable Development Goals (SDGs). Its implementation varies across regions due to differences in governance, institutional capacity, and national priorities (Sarangi, 2023; Wuwung et al., 2022). Cities and regions are key drivers, especially in sectors like seafood, tourism, and transport, with job creation and biodiversity conservation as major motivators (OECD, 2024). However, environmental risks, such as pollution, climate threats,

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and ecosystem degradation, highlight the need for inclusive, context-specific strategies and coordinated stakeholder engagement to ensure sustainable and equitable development. Existing research rarely fosters dialogue among stakeholders across disciplines, industries, and geographies (for a notable exception, cf. Almeida et al., 2025). To address this gap, we adopt Saetre and Van de Ven's (2021) four-step abductive reasoning approach, which supports shared sensemaking:

First, we introduce the Blue Economy as an ill-defined and transitory concept. Blue Economy discourses reveal conflicting definitions (Croft et al., 2024). Country-specific definitions show competing national and regional interests (Matovu et al., 2024), leading to economically driven initiatives that create ecological and social challenges on a global scale (Almeida et al., 2025; Fudge et al., 2023). Its scope and sustainability are debated across academic, policy, and industry circles, with terms like “blue growth” and “ocean economy” used inconsistently (Bennett et al., 2021). Many governance frameworks are temporary, poorly enforced, or lag behind emerging industries like offshore energy and blue biotechnology. These sectors often operate in regulatory vacuums, posing risks to marine ecosystems (Campbell et al., 2016; Silver et al., 2015). Although innovation is central to the Blue Economy, some technologies serve as short-term solutions until more sustainable alternatives emerge, reinforcing its transitory nature (Pakseresht et al., 2025).

Second, probing its significance based on three lenses from interdisciplinary literature – place, development, and sustainability (Germond-Duret, 2022) – helps discern the competing claims outlined in our research question and demonstrate their interconnectedness. Regarding place, oceans and seas have traditionally been described as placeless (Campbell et al., 2016; Germond-Duret, 2022; Walsh, 2021). However, history reveals that the oceans have been central to the rise of modern imperialism, marked by cruel confinement and exploitation, and have witnessed human oppression and degradation (Campling and Colás, 2021). The spatialization of oceans and seas is increasing. It is supported by technological innovations, such as geographical information system (GIS)-based mapping, which helps coordinate marine spatial planning (MSP) and global business activities within and across industries, jurisdictions, and geographies (Jarvis and Young, 2023; Spalding, 2016; Silver et al., 2015; Walsh, 2021). This form of appropriation of marine resources and spaces mirrors colonial land grabbing, where territories were seized for resource extraction and strategic control (Clark and Cisneros-Montemayor, 2024).

Addressing development, the Blue Economy “is currently valued at \$1.5 trillion and projected to double to \$3 trillion and support 40 million jobs by 2030” (World Economic Forum, 2022, p. 18). National governments and transnational institutions, among them the World Bank, the European Union (EU), the African Union, the UN, and the OECD, have supported entrepreneurial opportunities to nurture economic growth, improved livelihoods, and sustainable use of marine resources within and beyond coastal states' jurisdictions (Ertör and Hadjimichael, 2020; Lee et al., 2020). However, in the last decades, the emergence of new privatization regimes in industries, such as fisheries, oil extraction, and deep-sea mining, has led to an inequitable distribution of economic benefits among individuals and coastal communities (Bennett et al., 2021; Croft et al., 2024; Mallin and Barbesgaard, 2020). They mirror colonial patterns of resource exploitation. Colonial economies were largely built on extractive industries, often with little regard for sustainability or local communities' rights and livelihoods (Campling and Colás, 2021).

Regarding sustainability, SDG 14 Life Below Water is central to the Blue Economy, emphasizing the conservation and use of the oceans, seas, and marine resources for sustainable development (Spalding, 2016; The Global Goals, 2025b). Critics argue that its narrow ecological focus overlooks broader social and systemic drivers of marine biodiversity loss, highlighting the need for a more integrated, socio-ecological approach aligned with other SDGs (Niner et al., 2022). For instance, neither SDG 6 Clean Water and Sanitation nor SDG 13 Climate Action is among the top five SDGs addressed by research on the Blue Economy

(Lee et al., 2020), despite the pivotal role of oceans in global environmental change and climate regulation (Campbell et al., 2016). Business leaders and investors still need to understand the relevance of SDG 14 and inherent business opportunities: “Despite the impact multipliers of investing in the ocean, SDG 14 has the lowest level of financial investment of any development goal” (World Economic Forum, 2022, p. 3).

The subsequent sections of this study expand on the third and fourth steps of abductive reasoning, which supports the development of tentative explanations to address the competing views highlighted in our research question. Tentative explanations can be co-created and refined through dialogue, allowing stakeholders to explore ideas and lived experiences in a collaborative and safe environment. Opting for a qualitative research design, we collected narrations during four online workshops with diverse stakeholders. These narrations reflect the polyphony, equivocality, and politics shaping the Blue Economy (Mallin and Barbesgaard, 2020).

Finally, abductive reasoning lays bare tensions, especially when evaluating ideas and experiences. We applied grid-group analysis to evaluate the narrations because of its usefulness in contexts where different, often incompatible, views exist. This tool categorizes stakeholders into four groups with distinct views – hierarchists, egalitarians, individualists, and fatalists – and predicts their behaviors, based on two dimensions of sociality: “group” (the extent to which narrations are embedded within organizational or institutional frameworks) and “grid” (the extent to which narrations mirror transnational, national, or local rules and regulations) (Douglas, 1999). We collate antagonistic perspectives revolving around place, development, and sustainability, and discuss how “clumsy solutions” – temporary strategies that incrementally combine adversarial perspectives on problems (Halik et al., 2018) – embrace antagonism and might be pursued further.

The combination of the three lenses with grid-group analysis offers an opportunity to explore how stakeholders perceive and engage with the Blue Economy, how their perspectives on place, development, and sustainability were formed, and how these perspectives shape their approaches to the tension between growth and development, on the one hand, and the need to protect and sustain marine ecosystems, on the other.

## 2. Methodology

### 2.1. Workshop design and participants

We organized four online workshops with an average duration of three hours. Workshops create an environment where dialogue is encouraged, a plurality of voices and power dynamics exist, and stakeholders' lived experiences are crucial (Brown et al., 2025). Each co-researcher attended at least two workshops, taking on distinct roles such as organizer, co-facilitator, or delegate. One co-researcher was involved in all workshops because of their position as a scholar in an interdisciplinary maritime research institute in Germany and their leading role in organizing an event series for this institute as part of its commitment to knowledge dissemination and science communication in society. The co-facilitators ensured equal voice and a safe environment, applying the Chatham House Rule to encourage storytelling and shared sensemaking. The workshop design includes elements that facilitate equitable participation, such as flash talks with opportunities to ask critical questions and breakout sessions. These formats mitigate elite bias because they decentralize authority and give space to less dominant voices. Informed consent was obtained verbally or via email when the participants accepted the invitation to attend a workshop. Information about the delegates and the workshops is shown in Table 1.

Workshop 1 took place in October 2020. It was co-organized by the German institute and an institute in India. This workshop was intended to bring together interdisciplinary perspectives of the Global North and the Global South through an Indo-German collaboration and to identify emerging and critical research areas within the rapidly evolving Blue

**Table 1****Workshop Design and Participants.****Workshop 1** (October 2020): From Ship to Coast: Blue Economy and Sustainable Livelihood

Keynote speaker: Professor in sustainability (male), Germany

Breakout session 1: How can a “community first” approach in the Blue Economy be achieved?

Breakout session 2: How are coastal communities affected by climate change, and how can infrastructures be adapted to mitigate the impact?

Breakout session 3: How can women be empowered to participate in decision-making in the Blue Economy?

Delegates:

- Academic in energy and environmental policy with previous experience in the electrical equipment industry and as a government adviser, Japan
- Academic in water management with a background in electrical engineering and managerial experience in a company specializing in mechanized cleaning and dredging solutions for shallow water bodies, India
- Academic in environmental governance, India
- Academic in disaster management (PhD student), India
- Academic in microbiology and biogeochemistry, India
- Fisheries economist, Germany
- Academic in geopolitics of natural resources, India
- Academic in marine governance with previous experience in private and public sector organizations, among them a policy think tank, India
- Academic studying rare earth elements, India
- Academic studying sustainable ports management, Ghana
- Marine biologist, India
- Expert in fisheries with previous experience in the merchant navy and ocean conservation, India
- Oceanographer studying zooplankton diversity, India
- Maritime historian and curator, Germany
- Historian studying the Indian shipbreaking industry (PhD student), Germany
- Marine anthropologist studying coastal adaptation and protection, India
- Development sociologist with a focus on sustainability, India
- Academic in microbial ecology, India
- Civil engineer studying heavy metal pollution, India
- Academic in climate security (PhD student), India
- Founder of an NGO specializing in coastal and marine ecosystems, activist, and researcher in fisheries science (PhD student), Netherlands
- Oceanographer studying global warming and anthropogenic pressures (PhD student), Germany
- Marine data scientist (PhD student), Germany
- Fisheries scientist with consulting experience in the fisheries and aquaculture industries, Germany
- Academic in algal protein biochemistry (PhD student), India

**Workshop 2** (March 2022): Sustainability and the Blue Economy

Keynote speaker: Professor in political science and ocean governance (female), Germany

Flash talks guided by three questions:

- What is sustainability, actually?
- How can governance systems, economies, and infrastructures be designed and adapted to achieve sustainability?
- How can social justice, knowledge exchange, and education contribute to achieving a sustainable Blue Economy?

Delegates:

- Academic in disaster management (PhD student), India
- Sociologist and management educator, UK
- Lecturer in ship and port operations, UK
- Curator in a maritime museum, Netherlands
- Leader of a research group on ocean governance at a think tank, government adviser, Germany
- Tropical marine researcher, Germany
- Professor of communication of history of science, Germany
- Archaeologist and historian with expertise in maritime research and exhibition work, Germany
- Human-environment geographer specializing in water governance, India
- Marine biologist, volunteer in a foundation dedicated to the protection of the oceans, Germany
- Management researcher and educator at a university, UK
- Maritime anthropologist (PhD student), Germany
- Curator in a maritime museum, Norway
- Lecturer and policy adviser (PhD student in entrepreneurship ecosystems), Seychelles
- Lecturer in law and finance, lawyer with vast experience in legal practice and industry, UK

**Workshop 3** (June 2023): Sustainable Development Goals: Working Together for a Better Future in the Blue Economy

Keynote speaker: Global lead for sustainability in a multinational shipping corporation (female), UAE

Storytelling based on three questions:

- How do the UN SDGs affect your work practices, and how do you contribute to the UN SDGs? Do you see tensions between different SDGs? If so, how could they be overcome?
- Tell us a story about a time in which you or your organization adopted a new way of doing things (or helped others to do so) and how it contributed to achieving sustainability in the Blue Economy. What were potential obstacles, and how did you overcome them?
- What do you see as potential ways to achieve a truly sustainable Blue Economy in the future?

Delegates:

- Fisheries coordinator at a sustainable inshore fisheries trust, UK
- Executive director of an environmental non-governmental and non-profit organization dedicated to ocean conservation, Portugal
- Communications manager of an environmental non-governmental and non-profit organization dedicated to ocean conservation, Portugal
- CEO of a port authority, Denmark
- Chairman of a start-up in seaweed farming, Singapore
- Aquaculture specialist in a university-based agri-tech center, UK
- Managing director of a non-profit marine conservation organization, UAE
- General secretary of a non-profit marine conservation organization, UAE
- Port manager, Benin

*(continued on next page)*

**Table 1** (continued)

- Consultant, government adviser, and fellow at a think tank focusing on maritime research, India
- Chair of a non-government, non-profit organization representing business and industry, India
- Professor of operations management, Hong Kong
- Executive director of a maritime museum, Germany
- Archaeologist and historian with expertise in maritime research and exhibition work, Germany
- Communications director of a maritime museum, Germany
- Director of a center for critical management research at a British university, UK

**Workshop 4** (September 2023): Sustainable Development Goals: Working Together for a Better Future in the Blue Economy  
Keynote speakers:

- Co-founder of a social enterprise aiming to reduce plastic pollution (female), Netherlands
- Executive director of a maritime museum (female), Germany

Flash talks and discussions:

- How do the UN SDGs affect your work practices, and how do you contribute to the UN SDGs? Do you see tensions between different SDGs? If so, how could they be overcome?
- Tell us a story about a time in which you or your organization adopted a new way of doing things (or helped others to do so) and how it contributed to achieving sustainability in the Blue Economy. What were potential obstacles, and how did you overcome them?
- What do you see as potential ways to achieve a truly sustainable Blue Economy in the future?

Delegates:

- Maritime specialist with professional experience in supply chain management, port operations, and applied research, South Africa
- Government adviser with expertise in ocean conservation, climate change, and clean energy, UK
- Fellow and lead on climate change and energy in a policy think tank, India
- Specialist in auditing and corporate governance, water and marine lead at a global auditing company, background as an academic in oceanography, Norway
- Maritime specialist in green shipping and organizer of an annual Blue Economy convention, Germany
- Business consultant (PhD student in hospitality and seafood), Germany
- Student assistant in a shipbuilding company, Germany
- Associate professor in sustainability and global value chains, UK
- Professor of entrepreneurship and strategy, UK
- Assistant professor in strategy and innovation, specializing in sustainability and circular economy, UK
- Enterprise fellow at a university with experience as a public policy consultant and entrepreneur, UK
- Enterprise fellow at a university with industry experience, UK
- Project manager in a maritime industry cluster, Germany
- Project manager specializing in green offshore technology in a maritime industry cluster, Germany
- Head of the port economy and shipping department in a local authority for economic affairs and ports, Germany

**Notes:**

To ensure a balance in gender, geographical background, maritime sectors and industries, and professional roles and experiences, the co-organizers engaged in thorough planning and inclusive design. In particular, the German maritime research institute insisted on clear objectives for representation across gender, regions, and professional roles in line with its usual standards for all its activities.

The workshop questions connect place, development, and sustainability by grounding discussions in local contexts (e.g., coastal communities), exploring governance and infrastructure for sustainable development, and reflecting on practices aligned with the UN SDGs. Each question encouraged participants to link their ideas and experiences to spatial realities, systemic change, and future-oriented sustainability goals.

(Source: Authors' own work)

Economy. It laid the groundwork for subsequent workshops. The 25 delegates – academics at various career stages with different areas of expertise – mirror the emphasis on science and research. They had to apply for participation with their resumes and an abstract of their research in advance. The German partner organization insisted on clear objectives for representation across gender, regions, and professional roles in line with its usual standards for all its activities. Both co-organizers followed a jointly developed evaluation rubric, focusing on the relevance and diversity of engagement in Blue Economy-related fields. They received and independently reviewed 58 applications. Final decisions were made collaboratively. They accepted applications that demonstrated meaningful engagement (scholarly and/or practical) with various ocean-related industries and/or research topics. The workshop started with a keynote held by a renowned scientist in sustainability from a German university, to engage the audience with core concepts and map their intersections with sustainability, governance, development, and equity. It was followed by three breakout sessions focusing on three themes and a social and political agenda beyond environmental challenges: first, social inclusion and poverty eradication, second, climate change and its impact on coastal businesses and communities, and third, gender dimensions and equality in maritime workforces. The breakout sessions were facilitated by post-doctoral research fellows (1 female, 2 male) of the two host institutions. The outcomes of each breakout discussion were presented in a concluding plenary session.

Workshop 2 in March 2022 was co-organized by the German maritime research institute and a center for scholarship of business and legal

education at a British university. This workshop deepened the thematic focus of Workshop 1 on sustainability, governance, and inclusive development. It emphasized science communication and sustainability education. The professional backgrounds of the 15 delegates illustrate this emphasis. After a keynote delivered by a renowned academic in ocean governance, a series of flash talks – brief presentations outlining key ideas in an accessible way for a non-specialist audience – followed, leading to a plenary discussion and a wrap-up by the two co-facilitators. The flash talks were clustered around two issues: first, governance, economies, and infrastructures, and second, stakeholder rights, knowledge exchange, and education.

Workshops 3 and 4 built on the discussions in Workshops 1 and 2. They broadened the range of stakeholders involved by including participants from industry, startups, policy circles, and civil society. While Workshops 1 and 2 aimed to identify problematic issues, Workshops 3 and 4 deliberately focused on discussing potential solutions and managing for the future. To organize Workshop 3, the German maritime research institute allied with a center for critical management research at a British university. A leading sustainability expert from a major company in the global shipping industry delivered a keynote, followed by three rounds of discussion on the SDGs, innovation, and best practices to achieve sustainability in the Blue Economy, with 15 delegates who had accepted our invitation to join the online event in June 2023. Workshop 4 in September 2023 was co-organized by the German maritime research institute and a Blue Economy research group at another British university. Attendance was not restricted. We invited delegates and encouraged them to share the invitation with their contact

networks. The event combined flash talks and discussions with the audience following a keynote delivered by a Dutch start-up entrepreneur specializing in reducing plastic pollution in rivers and seas. The 16 delegates shared their lived experiences from different contexts and discussed their views on approaches to achieving sustainability and best practices.

2.2. Data collection and analysis

The online workshops were recorded, and the video files were transcribed. We opted for thematic content analysis. First, by reading through the transcripts, we engaged in open coding to identify narrative lines in each workshop. Second, we defined search terms referring to place, development, and sustainability, which either emerged from the literature or were found in the data. Regarding place, we specified ‘place (s)’, ‘boundaries’, ‘borders’, ‘distance’, ‘location’, ‘environment’, ‘region’, ‘nation’, ‘country’, ‘community’, ‘jurisdiction’, and ‘geographies’ as search terms. Development comprised ‘growth’, ‘economy’, ‘industry’, ‘business’, ‘livelihood’, ‘jobs’, ‘ecosystem’, ‘entrepreneurship’, ‘income’, ‘governance’, ‘ownership’, ‘policies’, ‘finance’, and ‘investment’. Sustainability included ‘SDG’, ‘balance’, ‘resilience’, ‘resources’, ‘innovation’, ‘renewable’, ‘blue’, ‘social’, ‘environmental’, and ‘climate’. Using these terms as an analytic template, we extracted narrations accordingly (Cassell and Bishop, 2019). Given our aim to discern narrations that reflect competing claims and acknowledging language as a vehicle for sensemaking, which is vital to abductive reasoning (Saetre and Van de Ven, 2021), we preferred focal examples over overarching summaries of participants’ narrations, allowing for rich, detailed, and contextualized insights (Reissner and Whittle, 2022). Quotes from keynote speakers were included and analyzed alongside the delegates’ contributions, because they anchored workshop discussions. The insights from domain experts, selected in alignment with each workshop’s theme, helped shape the thematic focus (Sharma et al., 2022). Speaker selection balanced academic, managerial, and industry perspectives.

Finally, using grid-group analysis, we evaluated the narrations. This tool, originally developed by anthropologist Mary Douglas, draws on two dimensions of sociality: “group” and “grid” (Mamadouh, 1999). We interpret “group” as the extent to which narrations are embedded within organizational or institutional frameworks (low group: individuation, high group: social incorporation); and “grid” as the extent to which the narrations are reliant upon or embedded within transnational, national, or local rules and regulations (low grid: laissez faire, high grid: regulatory mechanism). As depicted in Fig. 1, the combination of these dimensions leads to four antagonistic perspectives that differ in values,

worldviews, and approaches to risk: individualism, hierarchy, egalitarianism, and fatalism. We classified the narrations into these four perspectives to discern overlaps and differences regarding the competing claims on the Blue Economy highlighted in our research question.

3. Results

3.1. Place

3.1.1. Access and ownership

Mainly highlighted by the keynote speakers in Workshops 1 and 2, narrations describe forms of “blue (or ocean) grabbing”, i.e., the dispossession or appropriation of use, control, or access to coastal land, ocean areas, and marine resources from previous local users through governments or national and transnational corporations (Bennett et al., 2021). An example from the Cuban tourism industry illustrates the impact of the demarcation of territories on local communities:

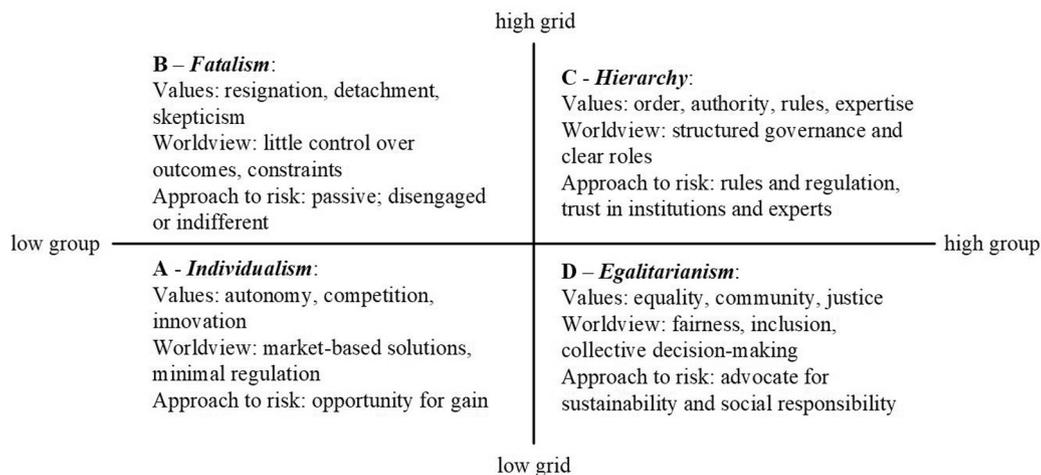
“Sometimes it’s really nice to go to a beach resort and feel like you are the only one there, but that means excluding local people, local communities from access to those beaches, non-paying guests. (...) an extreme version of this is what Cuba has done with its Varadero peninsula. If you’re a Cuban national, you have to actually cross a physical barrier like a proper state-to-state border” (Keynote speaker, Political scientist, Germany, Workshop 2).

Such narrations demonstrate how territorial demarcation in coastal development can lead to exclusionary practices that marginalize local communities.

3.1.2. Legislation

Some narrations related to legal issues. The United Nations Convention on the Law and the Sea (UNCLOS) is a case in point. According to the keynote speaker in Workshop 1, UNCLOS includes two major problems. First, over the last few decades, territorialization and privatization have increased in several blue industries, such as fishing, oil extraction, and deep-sea mining. This development jeopardizes freedom of movement and navigation across the oceans. Second, new globally operating actors have emerged. They aim to control ocean places, such as Areas Beyond National Jurisdiction (ABNJ), where no single state has authority.

“(...) this tension was largely shaped between (...) the geopolitical north and the south, that was devised around the concept of the common heritage of mankind. The general idea was that what can be



Based on Douglas (1999), Mamadouh (1999), Halik et al. (2018).

Fig. 1. Grid-Group Analysis, (Source: Authors’ own work).

found in the sea, especially on the sea floor, mineral resources and probably also oil to certain extent, would be (...) the common heritage of mankind, meaning that if someone has the means to exploit it in particular, if industrialized countries have the means to exploit it, then they would have to share to a certain extent, at least the technologies that they use, the access and the benefits that they can reap from these resources. (...). UNCLOS developed from the early negotiations in the (...) 1970s, and kind of permutated, through the 1980s, in the early 90 s, to a much more market-oriented scheme” (Keynote speaker, Scientist, Germany, Workshop 1).

UNCLOS does not specify legally binding mechanisms to protect ocean biodiversity in ABNJ, thus allowing for the perpetuation of unsustainable practices, such as overfishing. The SDGs cannot solve this issue, as they rely on UN member states and corporate stakeholders’ voluntary commitments:

“To move away from what could be perceived as nice pieces of words on paper to real implementation, and what is lacking so far is an effective process for pledging and reviewing. So, something that we have, for example, in the context of the Paris Agreement for climate policy and these nationally determined contributions, something like this is really missing for SDG 14 and would be really required to understand and assess the status quo. Where are we with specific challenges like the creation of marine protected areas or pollution or ocean acidification? Where do we want to go? What is the distance from the status to the aspired goal?” (Delegate, Research group leader on ocean governance at a think tank, Government advisor, Germany, Workshop 2)

So, progress regarding SDG 14 cannot be monitored or legally enforced.

### 3.1.3. Communities

Narrations on coastal communities highlight the land-sea interface (e.g., [Germond-Duret, 2022](#); [Matovu et al., 2024](#); [Walsh, 2021](#)). In countries that relatively recently decided to promote spatialization, residents are often not aware of newly created national borders or demarcation lines, as the following narration from the Bay of Bengal shows:

“Fishermen usually are not aware of these boundaries, so they tend to go for their fish, catch in certain areas which now fall in the boundaries of another country, and in this way, promote illegal fishing and overfishing. Blue Economy is a new concept here, and it is still being developed. So, people are not very aware of fishing bands and conservation zones” (Delegate, Researcher and policy advisor, India, Workshop 2).

Mirroring a vast body of extant research on seafarers (e.g., [Winchester et al., 2006](#)), communities can also be defined in professional terms and viewed as trans-local, as the following narration highlighting seafarers’ situation during the COVID-19 pandemic shows:

“After reading an article on the US website Bloomberg about 400,000 seafarers being stuck on board in the first month of the crisis, we became convinced that we had to record the stories of seafarers, asking them how the corona crisis influenced their work and lives at sea. (...) There's plenty of evidence that seafarers have been affected by the coronavirus pandemic and infection control measures and still are. In addition, many of the informants (...) state that they do not feel that society fully recognizes and appreciates their efforts. One seafarer expressed that the only ones who cared about seafarers stuck at sea were the family (...) others were just happy that they were not afflicted by the situation themselves” (Delegate, Museum curator, Netherlands, Workshop 2).

Seafarers of different nationalities often work under unequal conditions aboard the same ship due to the absence of a unified legal

framework. This circumstance affects rights and duties on ships, access to healthcare, union membership, wages, and job hierarchies, which are shaped by national regulations and the ship’s flag. Ships can easily change flags, often driven by owners’ cost considerations and preferences for limited regulation.

## 3.2. Development

### 3.2.1. Top-down and bottom-up initiatives

A policy-driven mindset inspires top-down initiatives in many countries. Seychelles’ entrepreneurship ecosystem is a case in point. The country engaged in training and upskilling entrepreneurs in blue industries and in connecting actors that had operated in silos so far:

“(…) it’s a very top-down generated agenda from government to grassroots. There was generally a lack of awareness amongst our participants with regard to the many elements in the Blue Economy that they could serve to diversify and innovate their ventures. They knew a lot about tourism, fisheries, and aquaculture, but they were coming out with ventures that were very prone to imitation and not innovation” (Delegate, Lecturer and policy advisor, Seychelles, Workshop 2).

The goal of the national government, however, was to stimulate innovation in, for example, biotechnology and diversification into overseas markets. The initiative disclosed that local entrepreneurs preferred staying local because of their fear of failure and the stigma of being a failed entrepreneur in society.

Some narrations highlight the need for multi-stakeholder approaches and bottom-up initiatives. A delegate in Workshop 2, a legal expert from the UK, pointed to shareholder activism to illustrate how seemingly small stakeholder groups can push large organizations toward sustainability. Activist investors can effectively force corporate leaders to abandon their original course of strategic action and promote a shift toward sustainability instead. An example is shareholder climate activism in oil and gas companies, which are supposed to transition from fossil fuels to blue energy sources, such as offshore wind energy, but tend to be hesitant.

### 3.2.2. Growth and performance

New finance instruments, similar to green bonds or climate mitigation financing, provide investors with guidelines for where and how to invest their money in line with sustainable development principles. Blue Finance encompasses financing mechanisms designed to fund projects aligned with the principles of the Blue Economy. A notable development is the emergence of Blue Bonds, a financing mechanism akin to Green Bonds but focusing on broader sustainability practices. However:

“Blue Finance in lieu of the Blue Economy is nascent. There are some guidelines that have come out. But how do we ensure that we are bringing value to the ecosystem through Blue Finance versus simply coming up with mechanisms that may be covered within the Green Finance mechanisms or within the Green Bond mechanisms, and how can we differentiate? And how do we ensure the indicators and the impact measurement make sense for Blue Finance? Whereby in Green Finance it’s very clear because you measure through carbon. But to do that, we need to set relevant targets to ensure accountability. There is currently no single unit of measurement for nature and biodiversity with the focus still on understanding risk. The global biodiversity framework and science-based targets, which we have committed to (...), are a step forward, but they still need to be translated so the company’s specific targets can be identified” (Keynote speaker, Global lead for sustainability in a multinational shipping company, UAE, Workshop 3).

This quote underscores the early-stage nature of Blue Finance and highlights the need for tailored metrics, clear differentiation from existing green instruments, and the translation of global biodiversity

targets into actionable, sector-specific frameworks.

### 3.3. Sustainability

#### 3.3.1. SDG 14

The difficulty in balancing the quest for sustainability and the valorization of the oceans for economic development inherent in SDG 14 is illustrated by the following narration:

“I was in Mumbai recently, and there was a major international conference on sustainability and Blue Economy. And outside the hall on a wall, there were the prize-winning paintings which emerged from an interschool competition in Mumbai, or perhaps the larger state of Maharashtra. And I naturally took time off to study those paintings done by the school children. Most of them are showing factories, the smoke going into oceans, killing fish, or the plastic litter going into oceans, or ships carrying their activities and thereby ruining the ocean. They conveyed the fundamental message that mankind is out to ruin, sorry, humankind is out to ruin oceans. And therefore, oceans should be left alone. Now I thought that this was a rather unidimensional message. And this ran counter to goal number 14. Which obviously states that we can harness the ocean properly, because today we are only 8 billion people. By 2050, we will be 10 billion people. And at that time, we may find it very difficult to ensure that the land-based resources are enough for humankind’s needs” (Delegate, Chair of a non-government, non-profit organization representing business and industry, India, Workshop 3).

This narration echoes tensions between targets related to SDGs 8 (8.1, 8.3) and 14 (14.2, 14.5) that were also outlined in other workshops:

“Taking measures to protect and restore marine and coastal systems might also lead to restrictions. (...) if you protect an area, you cannot build (...) tourism development projects at the same time or things like that” (Keynote speaker, Scientist, Germany, Workshop 1).

This dissonance stresses the need to reconcile environmental protection with human needs. While emphasizing sustainability risks stifling the use of aquatic resources to feed and provide energy to a growing population, neglecting it jeopardizes life on earth.

Many delegates were critical of the non-binding character of SDG 14. They also highlighted its linkages with other SDGs, such as clean water and sanitation (SDG 6), the improvement of decent work (SDG 8), gender equality (SDG 5), poverty reduction (SDG 1), and sustainable consumption (SDG 12), and the connection between climate change (SDG 13) and ocean health. Environmental, social, and economic aspects must be considered, further underlining the need to take interconnections between the SDGs into account, involve local, national, and transnational actors, and do collaborative, interdisciplinary research in line with SDG 17 Global Partnership for Sustainable Development.

#### 3.3.2. Sustainable innovation

In the workshops, it transpired that innovation could add to the economic, ecological, and social sustainability dimensions of the Blue Economy. Delegates discussed the consequences of a growing world population’s consumptive choices and how these could be addressed by developing solutions to overcome an increasing scarcity of land-based resources, such as biofuels and adhesives based on marine resources. Drones, sound monitors, and other technological gadgets can monitor and mitigate the impact of fishing and seafaring on ocean biodiversity. However, innovative technologies are often not affordable to local communities, especially in the Global South. This circumstance underlines the need for new financing instruments in the Blue Economy.

Another narration refers to “bubble curtains” in rivers, a technological innovation based on air bubbles under the water surface, that prevents plastic waste from flowing into the oceans:

“We use (them) to remove plastics from waterways, but we cannot do that without actually monitoring the amount of plastic that we’re catching, increasing the awareness of plastic pollution, and ensuring sustainable processing. So just an hour ago, I was standing at that (bubble barrier) with a lot of citizens and other volunteers sorting out the first big bag with trash to figure out, okay, how many Styrofoam little balls, how much did we find? We count them, we weigh them (...), and I’m having multiple conversations with policymakers on both local, regional, national, and European levels on how we can get plastic pollution regulation (...). (...) If we talk about SDGs, it’s also more towards regulation, different technologies, and how do we get to that point of policy?” (Keynote speaker, Social entrepreneur, Netherlands, Workshop 4)

This narration emphasizes that sustainability requires more than technological innovation. It demands data collection, public engagement, and policy change across governance levels.

### 3.4. Competing claims

The narrations show how stakeholders deal with the conundrum arising from issues around ownership and control (place), the economic needs of countries and communities (development), and the quest for resilient ecosystems (sustainability). Evaluating the narrations based on grid-group analysis reveals four antagonistic perspectives, entailing different responses to competing claims and priorities, which are shown in Table 2.

*Individualistic* responses are classified as “low group” as they are typically carried by globally operating businesses or local commercial enterprises aiming to ensure their livelihood. They are classified as “low grid” because individualists pursue a market logic, according to which they compete for superior positions in their industries, access to ocean places on land and at sea, and exclusive ownership of marine resources. The individualistic perspective is powerful in places in urgent need of economic growth and development. It highlights the tension between SDG 14 and SDG 1. For instance, a delegate responsible for port management in Benin (Workshop 3) underscored the challenge of reconciling profit with environmental protection. Highlighting the fishing sector, they described a conflict between traditional, small-scale

**Table 2**  
Dealing with Tensions in the Blue Economy.

	Low group	High group
High grid	<p><b>Fatalism</b>  <i>Entrepreneurial and industrial opportunities:</i>                      adapting passively to external constraints, viewing opportunities as beyond control  <i>Protection of marine ecosystems:</i>                      complying with imposed regulations and accepting developments without seeking to exert influence                      e.g., coastal communities, seafarers, traditional fishermen</p>	<p><b>Hierarchy</b>  <i>Entrepreneurial and industrial opportunities:</i>                      promoting structural development through regulation, planning, and institutional oversight  <i>Protection of marine ecosystems:</i>                      relying on formal rules, expert knowledge, and institutional frameworks                      e.g., government advisers, port authorities, specialists in auditing and corporate governance</p>
Low grid	<p><b>Individualism</b>  <i>Entrepreneurial and industrial opportunities:</i>                      emphasizing innovation, market-driven solutions, and minimal regulation  <i>Protection of marine ecosystems:</i>                      advocating for market-based solutions, technological innovations, and voluntary action                      e.g., industrial fishing companies, multi-national enterprises</p>	<p><b>Egalitarianism</b>  <i>Entrepreneurial and industrial opportunities:</i>                      advocating for community-driven approaches that prioritize equity, stewardship, and social benefit  <i>Protection of marine ecosystems:</i>                      promoting community empowerment and collective responsibility                      e.g., social and environmental activists, social enterprises</p>

(Source: Authors’ own work)

fishermen feeding communities and the influx of industrial fishing operations from abroad, which offer more lucrative employment opportunities while destroying sensitive ecosystems through industrialized forms of fishing. Poverty eradication, a fundamental quest of SDG 1, can seem at odds with environmental protection when livelihoods are at stake. As the delegate put it, “*When you have poverty, you cannot think of SDGs.*” Achieving the SDGs requires addressing the poverty-sustainability tension and the power imbalance between local entrepreneurs and multinational companies investing in developing coastal countries.

Government action and actors adhering to formal governance and rules for problem-solving and coordination represent *hierarchy* (Douglas, 1999). They are classified as “high group” as they are collective (e.g., government or multilateral institution action), and “high grid” because the narrations highlight how bureaucratic frameworks, such as UNCLOS, and national legal systems allow countries to demarcate ocean places and exploit them. Hierarchists believe in effective regulation and institutions (Douglas, 1999). However, mechanisms such as UNCLOS imply “*an inner tension between enclosure and mobility*” (Keynote speaker, Scientist, Germany, Workshop 1). On the one hand, UNCLOS enables nation-states to engage in spatial planning and maritime surveillance, allowing them to claim control and ownership of ocean places and marine resources in terms of, for example, exclusive economic zones (EEZ) and marine protected areas (MPA); on the other hand, UNCLOS tries to ensure free access to the seabed and mobility across the oceans in line with the idea of a common heritage of humankind (Campling and Colás, 2021; Halik et al., 2018). The Blue Economy is about the exploration of the oceans and the valorization of marine resources for commercialization and industrialization. Simultaneously, new knowledge about the oceans nurtures the concentration of power and control in state-led and corporate actors.

A delegate with combined expertise in corporate governance, auditing, and ocean science painted an optimistic picture, demonstrating their belief in the effectiveness of global marine governance:

“There is a tsunami of regulations coming from different directions and levels, and especially from the EU and national, and (...) there is one specific (...). It's called Corporate Sustainability Reporting Directive, CSRD, and it comes from the EU, (...) Basically, it requires companies to seriously evaluate their dependencies, risks, and impacts on nature in general and on the ocean and water as well, so in practice I think it will be a major wake up call for many industries, both ocean-based but also (...) all the other things. We know planetary boundaries, for example nitrogen and phosphorus, are hugely exceeded, and that's also because, due to the land-based activities, agriculture and so on, all this pollution is being transported into the ocean” (Delegate, Specialist in auditing and corporate governance, water and marine lead at a global auditing company, Norway, Workshop 4).

The CSRD may push many industries toward implementing the SDGs, at least to a certain extent:

“There is a lot of like regulatory pressure that requires companies to do good (...), we all can do better when it comes to policy advocacy, to push the policymakers to stricter regulations to enable this transition to more sustainable practices” (Delegate, Specialist in auditing and corporate governance, water and marine lead at a global auditing company, Norway, Workshop 4).

In line with *egalitarianism*, actors such as ocean conservationists, scientists, NGOs, and activists point to alternative, community-centered solutions. They are classified as “low grid” because they advocate for grassroots-level, bottom-up rather than transnational and regulatory responses. They are viewed as “high group” because they are embedded within local communities while being part of a wider network of actors sharing similar concerns (e.g., international scientific collaboration). This perspective contrasts with hierarchical approaches often promoted

by governments. For instance, Seychelles' entrepreneurship ecosystem initially followed a top-down approach, neglecting coastal community perspectives. Local needs required a renewed focus on grassroots engagement. This insight is evident in ongoing initiatives, such as the exploration of blue carbon potential in Seychelles' vast, uncharted seagrass meadows. These meadows represent a powerful carbon sink, exceeding even rainforests, yet knowledge gaps concerning their location, species composition, and community awareness remain. Surveys revealed limited public understanding of the seagrass meadows. In response, academic researchers' collaborative efforts with the government seek to foster bottom-up engagement, aiming to quantify the seagrass meadows' carbon capture potential and inform sustainable and inclusive management plans.

*Fatalists* are classified as “low group” because of their weak social integration and “high grid” because they face strong external constraints. They tend to adapt passively to external pressures and view efforts to promote change as futile (Douglas, 1999). Seafarers, working under precarious conditions and maintaining the global shipping industry whilst being widely overlooked – a phenomenon that a museum curator documenting seafarers' working conditions during COVID-19 described as “*sea-blindness*” – is an example of this perspective. It illustrates a striking lack of bargaining power resulting from ineffective international labor regulation. According to another delegate in Workshop 2, a UK-based sociologist, despite the existence of the International Labor Organization (ILO), a specialized agency of the UN dedicated to promoting internationally recognized human and labor rights, and the Maritime Labor Convention, a negotiated agreement that transitioned to a set of enforceable standards for improving seafarers' working conditions in ILO member states that ratified it in 2013, it is problematic to enact international regulation because seafarers do not have an effective international trade union.

#### 4. Discussion

Balancing competing claims in the Blue Economy is challenging. Nonetheless, as depicted in Table 3, delegates suggested temporary responses – “clumsy” solutions – incrementally combining adversarial positions (Halik et al., 2018). In combination with actual initiatives, they could inspire recommendations for policymakers.

First, delegates discussed emerging technologies nurtured by cross-sector collaboration, such as the adoption of green fuel in global shipping through collaborative infrastructure development in a major Scandinavian port. The emergence of green fuels like ammonia presents a promising avenue for decarbonizing maritime transport, but market adoption faces a dilemma. Ship owners hesitate to invest in new vessels without readily available infrastructure, and fuel producers are reluctant to scale up production without guaranteed demand.

“There is a demand from the ship owners saying the port should build the infrastructure, otherwise it's never going to happen. Or the companies should start creating or should start planning for that green ammonia. And we already see ship owners ordering ships that are ready for this green ammonia. We're lucky to have one of these big ship owners having roots in the port. And then, of course, bringing these companies together, the port, the ship owner, and the producer of the green ammonia” (Delegate, CEO of a port authority, Denmark, Workshop 3).

Recognizing the potential of green ammonia, the port authority partnered with a major local ship owner and a Norwegian green ammonia producer. By bringing these key individualistic (companies) and hierarchical (port authority) stakeholders together, they co-created opportunities for green fuel utilization in the region. This proactive approach, which can be denoted as *techno-solutionism* and encompasses infrastructure development, vessel readiness, production capacity, and demand, illustrates the potential of inter-organizational, cross-sectoral collaboration to share the risks and financial investments related to

**Table 3**  
Embracing Antagonism.

Narration	Green ammonia	Bubble curtains	Seafarers' working conditions
<b>Dominant lenses</b>	Sustainability: green fuel adoption Development: profitability, economic growth	Place: ownership, responsibility Development: technological innovation Sustainability: water pollution	Place: transnational void Development: seafarers' welfare
<b>Stakeholders and perspectives</b>	Port authority: hierarchy Shipowners: individualism Fuel producers: individualism	Local community (citizens): egalitarianism Governments and authorities: hierarchy Social enterprise: individualism	Seafarers: fatalism Shipowners: individualism Governments: hierarchy
<b>Temporary ("clumsy") response</b>	<b>Techno-solutionism:</b> – Development, diffusion, and acceptance of innovation – Inter-organizational collaboration across industries and geographies	<b>Localism:</b> – Community-level initiative – Externally sourced technical solution	<b>Transnationalism:</b> – Multinational professional community – Transnational regulation
<b>Policy recommendation</b>	Sustainable port development Phases should include: diagnostic assessments, strategic planning and roadmap development, integrating green technologies, capacity building (transport, energy, and digitalization), stakeholder mapping and engagement, moving from local (e.g., island) innovation to ecosystem innovation (national and regional alignment) Examples of verification mechanisms: development tracking system (transport, energy, and digital dimensions), social responsibility disclosure in line with the EU's Corporate Sustainability Reporting Directive (CSRD)	Legal and institutional frameworks for community-led environmental initiatives Phases should include: participatory governance design, local innovation grants for pilot projects, developing toolkits and guidelines, integrating successful models into municipal and regional planning across communities Examples of verification mechanisms: environmental impact assessments and feedback surveys	Transnational labor framework Phases should include: international dialogue to build consensus among governments, ship owners, unions, and NGOs, drafting a charter that defines wage equity and labor rights for seafarers, aligning national labor laws with the charter, creating a transnational regulatory platform, establishing wage transparency and grievance mechanisms, regular reviews Examples of verification mechanisms: independent labor inspections, reporting systems for grievances and violations
<b>Role models</b>	Seychelles and RISE: advancing sustainable ports for Small Island States (Lind et al., 2025)	EU Blue Deal (EESC, 2023)	Maritime Just Transition Task Force (Maritime Just Transition, 2022)

(Source: Authors' own work)

sustainable innovation in the Blue Economy.

To accelerate the adoption of sustainable port operations, policymakers should consider phased implementation and robust verification mechanisms, as exemplified by Port Victoria, Seychelles. The port's transformation follows a structured pathway: initial diagnostics and strategic planning, followed by progressive integration of green technologies, digital systems, and social responsibility measures, with full sustainability targeted by 2030. Verification is supported by capability maturity frameworks and a social responsibility model aligned with the EU's Corporate Sustainability Reporting Directive (CSRD), enabling ports to track progress across environmental, economic, and social dimensions. This approach offers a transferable blueprint for other ports, particularly in Small Island Developing States, to pursue resilient and inclusive maritime development (Lind et al., 2025).

Second, some narrations highlighted unclear responsibilities. For example:

“Water moves across borders, so the river carries plastic as well, which makes it very hard to assign ownership. (...) Capturing plastic pollution after it has entered our waterways is very, very difficult because everyone finds it important, but nobody is actually responsible.” (Keynote speaker, Social entrepreneur, Netherlands, Workshop 4)

The response was a local collaboration between stakeholder groups, as illustrated by “bubble curtains”. The keynote speaker's example, located in Western Europe, entailed collaborating among citizens of a community about one kilometer from the sea, private organizations, multiple governments, and the speaker's social enterprise. These actors, representing egalitarian (citizens), hierarchical (governments and authorities), and individualistic (the speaker's venture) perspectives, jointly assumed responsibility and implemented the first community-led bubble curtain worldwide.

To support community-led environmental interventions (i.e., *localism*), governments should establish legal and institutional frameworks that define stakeholder roles and responsibilities. A phased implementation pathway could begin with participatory governance

design to initiate collaboration, followed by local innovation grants to pilot solutions and generate learning. Subsequent phases should include the development of toolkits and guidelines to support scaling, and the integration of successful models into municipal and regional planning. Verification mechanisms such as environmental impact assessments and community feedback surveys are essential to ensure effectiveness and accountability. This approach aligns with the EU Blue Deal's emphasis on shared responsibility, local empowerment, and adaptive governance (EESC, 2023), and it offers a replicable model for inclusive sustainability in coastal and marine contexts.

Third, to support the livelihood of vulnerable professional communities, transnational regulatory solutions are required. For example, seafarers are currently treated as different national workers. This treatment does not align with SDG 8 Decent Work and Economic Growth, most notably, target 8.5, which promotes equal pay for workers performing similar tasks (The Global Goals, 2025a). If seafarers were viewed as similar multinational co-workers, equitable wages could be negotiated between governments, employers, and worker representatives in a transnational space. Wages and working conditions would no longer be subject to national standards but would be derived from similar professional practices of a multinational professional community. This form of *transnationalism* would blur the lines between hierarchical (governments), individualistic (ship owners), and fatalistic (seafarers) perspectives.

To ensure fair wages and decent working conditions for seafarers across jurisdictions, policymakers should establish a transnational labor framework aligned with SDG 8.5. Implementation should begin with international dialogue among governments, ship owners, unions, and NGOs to draft a charter defining wage equity and labor rights for seafarers as a global workforce. In subsequent phases, national labor laws must be harmonized with the charter, and a transnational regulatory platform should be created to oversee compliance. Verification mechanisms, such as including independent labor inspections, grievance reporting systems, and regular reviews informed by worker feedback, ensure accountability and continuous improvement. The Maritime Just Transition Task Force, launched at COP26, offers a phased model for

such efforts, combining stakeholder engagement, policy development, pilot programs, and scaling, alongside tools for monitoring labor conditions and benchmarking progress (Maritime Just Transition, 2022).

## 5. Conclusion

This study contributes to a holistic understanding of the Blue Economy by combining narrations of place, development, and sustainability with grid-group analysis to explore how diverse stakeholders cope with the tension between growth and development, on the one hand, and the need to protect and sustain marine ecosystems, on the other.

While our methodological approach enabled rich dialogue, a key limitation refers to the collection of narrations that do not draw on stakeholders' first-hand experiences but are told by "observers" familiar with the context and situation. Specifically, the fatalist perspective was not represented by affected community members in our workshops. Therefore, for example, we gave seafarers a voice by inviting social scientists and museum curators to speak on their behalf, and a port manager from Benin commented on West African traditional fishermen. Future research addressing social justice and equity could opt for case studies (e.g., Fudge et al., 2023; Phelan et al., 2020) or participatory research (e.g., Almeida et al., 2025; Brown et al., 2025) to explore marginalized groups and communities' lived experiences in depth.

Our evolving workshop design reflects efforts to broaden sectoral coverage in response to the Blue Economy's fluid boundaries (e.g., Spalding, 2016; Voyer et al., 2018; Zhu et al., 2023). We were aware of the risk of self-selection bias when we sent out calls for participation in Workshops 1 and 2. Hence, after an initial analysis of the data collected during these events, we planned Workshops 3 and 4 differently. Unfortunately, we failed to convince experts in sometimes-contentious industries, for example, offshore oil and gas, seabed mining, luxury yachts, or naval warfare, to join our events. Representing these industries would have drawn a more complete picture of the Blue Economy.

Finally, despite attempts to mitigate elite bias, keynote speakers and plenary formats may have reinforced hierarchical dynamics. Alternative formats such as point-counterpoint debates or anonymous polling could enhance inclusivity. Overall, our methodology balanced breadth and depth, but future studies should further refine participatory strategies to ensure equitable representation and engagement.

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## CRediT authorship contribution statement

**Knut Stefan Garrit Lange:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Paul Caussat:** Writing – review & editing, Visualization, Project administration, Methodology, Funding acquisition. **Katharina Bothe:** Writing – review & editing, Resources, Project administration, Methodology, Data curation, Conceptualization. **Carolin Decker-Lange:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Data curation.

## 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.

## Data availability

Data will be made available on request.

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