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A Critical Assessment of the Contribution of Integrated Ocean Management to Protection of the Marine Environment

A combined study of the premises and compatibility of integrated approaches to ocean management with the demands of the management objective of protecting the marine environment

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Abstract

This dissertation interrogates how integrated ocean management contributes to protection of the marine environment. This is analyzed through three papers that discuss three cross-cutting themes: (1) Disentangling and structuring abstract and practical variants of integrated ocean management; (2) Identifying ways of approaching and concretizing protection of the marine environment as a management objective; (3) How to assess the contribution of integrated ocean management to protection of the marine environment. These themes capture concepts, objectives, and problems that are important premises for law and governance of the oceans.

Facing the complexities of “governance” and of societal objectives, integrated ocean management and other variants of integrated approaches to ocean management or ocean governance offer a single lens through which to condense or abstract vast amounts of information with conflicting premises. Therefore, it becomes important to specify which issues integrated approaches can resolve and which issues are excluded or marginalized.

This dissertation approaches protection of the marine environment by means of a problem analysis (a macroanalysis) of what the environmental objectives and problems of the ocean require. The analysis then specifies some problem aspects, which have implications for law and management. These problem aspects and implications are explored in a case study and a study of an illustrative ocean management mandate.

The dissertation concludes that the potential of (integrated) ocean management to contribute to protection of the marine environment is limited. Integrated ocean management primarily contributes to more restricted environmental objectives. The conclusion entails that preceding a claim that ocean management or governance contributes to protection of the marine environment should be an experimental explanation, perhaps resulting from a problem analysis, of how the ocean management mandate, instrument, or concept possibly responds to the environmental problems and approaches that protecting the marine environment demands.

Key words: integrated ocean management; ocean governance; integrated approach; marine spatial planning; marine environmental management; marine environmental protection; marine ecosystem governance; environmental management; marine governance; integrated marine policy

List of Papers

This dissertation consists of this document and the following appended Papers, which are referred to in this document by their Roman numerals. The three Papers were written by me as single author.

- Paper I: “More or Less Integrated Ocean Management: Multiple Integrated Approaches and Two Norms,” *Ocean Development and International Law*, 51(2), (2019): 95-115
- Paper II: “The Contribution of Integrated Marine Policies to Marine Environmental Protection: The Case of Norway,” *International Journal of Marine and Coastal Law* 36, no 2 (2021; *In press*), doi:10.1163/15718085-bja10048
- Paper III: “If Ocean Management is your Regime, which Objectives are Consistent with its Scope?” *Submitted manuscript*

1 Introduction

1.1 Topic

The nature and scale of global environmental problems challenge governance of the oceans. Serious degradation of the ocean environment is continuously confirmed by recent scientific assessments and reports. These include the United Nations' (UN) First Global Integrated Marine Assessment (World Ocean Assessment I, WOA1), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services' Global Assessment Report on Biodiversity and Ecosystem Services (IPBES report), and the Intergovernmental Panel on Climate Change's special report on the ocean and cryosphere in a changing climate (IPCC special report).¹ Beyond the scientific assessments, the problems of the marine environment are becoming more visible and recognizable for everyone, with the increase in polluted shores, plastic gyres, and rising ocean temperatures. Worldwide, strong political attention is drawn to this fundamental societal problem and the need to protect the marine environment. One demonstration thereof is the UN Sustainable Development Goal (SDG) no. 14, which aspires to “conserve and sustainably use the oceans, seas and marine resources for sustainable development.”²

Meanwhile, the oceans are subject to growing human presence. Humans are expanding in terms of number and area inhabited, and human activities are expanding and becoming more technologically sophisticated. Compared with the increasingly mono-cultural and urbanized terrestrial parts of the world, the ocean is rich in biodiversity and has vast resources to be explored and exploited to meet the basic human needs of food and energy, and beyond. These opportunities similarly attract strong political attention, as evident, for example, in the national and regional initiatives embracing the blue economy.³

In response to these ocean-related societal problems and needs, a set of concepts or approaches has emerged. The concepts and approaches that will be investigated are the integrated concepts or integrated approaches to ocean governance.

¹ Lorna Inniss et al, *The First Global Integrated Marine Assessment - World Ocean Assessment I*, (New York: United Nations, 2016), available at <https://www.un.org/regularprocess/Content/First-World-Ocean-Assessment>. (World Ocean Assessment II was not published as per the submission of this dissertation); S. Díaz et al, “IPBES Summary for Policy Makers,” in *IPBES the Global Assessment Report on Biodiversity and Ecosystem Services*, (Bonn, Germany: IPBES, 2019), available at <https://www.ipbes.net/Global-Assessment>; H.-O. Pörtner et al, “IPCC Summary for Policymakers,” in *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*, (Geneva, Switzerland: IPCC, 2019), available at <https://www.ipcc.ch/srocc/>. Section 4.4 presents these assessments and reports.

² One of 17 global goals, adopted by the UN General Assembly (UNGA) in a 2015 plan of action, UNGA/RES/70/1 “Transforming Our World: The 2030 Agenda for Sustainable Development”.

³ Such as Erico Duarte, “Brazil, the Blue Economy and the Maritime Security of the South Atlantic,” *Journal of the Indian Ocean Region* 12 (2015); European Commission, “The EU Blue Economy Report 2020,” (Luxembourg: Publications Office of the European Union, 2020).

Integrated approaches have emerged in parallel with a focus on protecting the environment as a problem of wider reach.⁴ In 1972, the UN Conference on the Human Environment was held, drawing international attention to environmental problems.⁵ This, the UN's first major conference on environmental problems in general (unlike specific problems), resulted in the Stockholm Declaration, Principle 13 of which declares that

... States should adopt an integrated and co-ordinated approach to their development planning so as to ensure that development is compatible with the need to protect and improve environment for the benefit of their population.⁶

This principle promotes an integrated approach to what I interpret as socio-economic development planning in combination with protecting the environment. Further, the United Nations Convention of the Law of the Sea (UNCLOS) of 1982 articulated "that the problems of ocean space are closely interrelated and need to be considered as a whole".⁷ UNCLOS imposes on states to protect the marine environment, while conferring to them rights to use and exploit it.⁸ The Rio Conference of 1992 buttressed the integrated way of thinking.⁹ It introduced the term "sustainable development," which integrated (socio-economic) development and environmental protection in one concept.¹⁰ The implementation plan adopted at the Rio Conference, Agenda 21, included three chapters on integration: to decision-making, to management of land resources, and integrated management and

⁴ For example, "The advancement of science gradually generated concern over problems of a wider reach, namely global commons problems, such as the depletion of the ozone layer, climate change, biodiversity loss or depletion of fish stocks," J Van Erp et al, "Introduction. The Concept of Smart Mixes for Transboundary Environmental Harm," ed. Judith Van Erp et al, in *Smart Mixes for Transboundary Environmental Harm* (Cambridge: Cambridge University Press, 2019), pp. 3–4.

⁵ Jan H. Jans, "Stop the Integration Principle," *Fordham International Law Journal* 33, no. 5 (2010), p. 1535. Philippe Sands et al, *Principles of International Environmental Law*, 4th ed. (Cambridge: Cambridge University Press, 2018), pp. 21–51 provides a more extensive historical account, and on p 227, explains how a UN conference in 1949 and a UN resolution of 1971 also identifies the linkage between environmental conservation and socio-economic development.

⁶ UNGA/CONF.48/14/Rev.1 "Report of the United Nations Conference on the Human Environment (Stockholm Declaration)," (1972).

⁷ "United Nations Convention on the Law of the Sea," of 10 December 1982, 1833 *U.N.T.S.* 3, in the preamble.

⁸ *Ibid.*, art. 192 sets out the obligation. Arts. 2, 56, 77, and 87 define rights of states and art. 193 recognize the sovereign right of states to exploit their natural resources.

⁹ UNGA/CONF.151/26 (Vol. I) "Rio Declaration on Environment and Development," (1992); United Nations Conference on Environment & Development, "Agenda 21 - Global Programme of Action on Sustainable Development," (1992).

¹⁰ For example, as evident in Principle 4 of the UNGA/CONF.151/26 (Vol. I) "Rio Declaration on Environment and Development." Sustainable development was later refined by the UN General Assembly to capture the three economic, social and, environmental dimensions, see for example, UNGA/RES/66/288 "The Future We Want," (2012).

sustainable development of coastal and marine areas.¹¹ In parallel with the Rio Conference, the Convention on Biological Diversity (CBD) was adopted, the objective of which is conservation of biodiversity, sustainable use of its components, and equitable sharing of the benefits of the use of genetic resources.¹² Article 6 of the CBD promotes the integration of conservation and sustainable use of biodiversity into relevant plans and policies.¹³ Strategies, decisions, and reports related to the CBD promote integrated marine and coastal area management.¹⁴ Other regional legal and policy instruments promoting similar approaches include the Protocol on Integrated Coastal Zone Management to the Barcelona Convention and the Integrated Coastal Management Code and framework of the Partnerships in Environmental Management for the Seas of East Asia.¹⁵

The integrated concepts or approaches to ocean management or governance are many and different.¹⁶ The difference depends, among other things, on the kind of integration in focus. The kind of integration in focus of this dissertation is the (integrated) response or contribution to a broad set of objectives relevant to ocean management.¹⁷ The expression “integrated ocean management” (IOM) is used to capture this kind of integration. IOM could, on the one hand, refer to theoretical ideas or directions such as a concept or norm. IOM could, on the other hand, refer to management instruments or regimes that operationalize an integrated approach. Paper I discusses concepts and norms of integration relevant to marine management, relying, roughly speaking, on the instruments of the previous paragraph. The norms include (1) the framing of IOM as a management process for the protection and sustainable use of the marine environment, relying on the ecosystem approach; (2) the integration of environmental, economic, and social concerns into an (ocean management) policy. Paper II discusses how IOM is operationalized in Norway, and Paper III discusses an illustrative ocean management mandate.

¹¹ Chapters 8, 11, and 17 (sub-heading) respectively in “Agenda 21 - Global Programme of Action on Sustainable Development.” Agenda 21 has since its adoption been reiterated in subsequent UN conferences and summits on sustainable development (Paper I).

¹² “Convention on Biological Diversity” (CBD), adopted June 5, 1992, in force December 29, 1993, 1760 *U.N.T.S.* 79, (1992), art. 1.

¹³ *Ibid*, art. 6 (b).

¹⁴ Paper I discusses this implementation tool as evident in CBD strategies, decisions, and reports.

¹⁵ “Protocol on Integrated Coastal Zone Management in the Mediterranean, to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean,” adopted at Barcelona on February 16, 1976, amended on June 10, 1995, and entered into force on March 24, 2011, 1858 *U.N.T.S.* 402; PEMSEA, “The Integrated Coastal Management (ICM) Code and Framework,” (2016), established by the 2006 Haikou Partnership Agreement. PEMSEA means Partnership in Environmental Management for the Seas of East Asia.

¹⁶ For the purpose of sections 1 to 3, management and governance are used interchangeably. Section 4.1.1 explains these terms in more detail.

¹⁷ Similarly, for example, “‘Integrated’ in ICM refers to the integration of objectives and also...,” PEMSEA, “The Integrated Coastal Management (ICM) Code and Framework,” section 3.

Other concepts and approaches exist that are similar to concepts of IOM, such as the ecosystem approach to ocean governance, marine environmental management approaches, and marine (or maritime) spatial planning. As evident in example (1) in the previous paragraph, which refers to the ecosystem approach, these concepts often refer to each other, and are used in combination. Sections 3.2–3.4 explain the combined and sometimes interchangeable use of these, identify the broader set of concepts associated with the subject of ocean governance, and the extent to which the aforementioned three (ecosystem approach to ocean governance, marine environmental management approaches, and marine spatial planning) capture the kind of integration in focus.

Naturally, concepts are influenced by the ideals and ideas of the time. The ideals and ideas that this dissertation will deal with include complexity, socio-ecological or ecocentric orientation, the governance revolution, and process management. Arguably these bring enriching perspectives. As for any ideals and ideas, they often contrast previous ones. This is also the case with integrated approaches to ocean governance. As section 3.1 will explain, justifications of these approaches in recent scholarly literature often contrast those ideals and ideas: as a response to a conditioned (or silo or fragmented) approach,¹⁸ an anthropocentric focus,¹⁹ and a top-down management focus disregarding inclusive processes.²⁰

Yet, above all, the integrated approaches to ocean management retain their justification as a relevant response to a wide set of societal objectives and problems related to the oceans. This justification is evident (whether explicitly phrased as integration or implicitly by embracing a broad set of societal objectives) in recent policy initiatives and a continuous high demand for research on the topic. To support the implementation of SDG no. 14, the 2017 UN Ocean Conference stressed the need for an integrated approach, at all levels, to reach ocean sustainability.²¹ In 2018, 14 coastal states established an international ocean policy body, the High-Level Panel for a Sustainable Ocean Economy, which argues that “[w]e must approach ocean management in an integrated manner in order to achieve the

¹⁸ For example, “Traditional silo-structured management, focusing on a single species or sector, is widely seen as insufficient,” Rachel D. Long and et al, “Key Principles of Marine Ecosystem-Based Management,” *Marine Policy* 57 (2015), p. 53.

¹⁹ For example, “Modern good governance shifts decision-making toward (...) ecosystem-oriented integrated management,” Anthony Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” *Current Opinion in Environmental Sustainability* 4, no. 3 (2012), p. 352.

²⁰ For example, “it is increasingly evident that modern governance processes require more sophisticated techniques than administrative solutions and top-down directives,” Charles Ehler, Jacek Zaucha, and Kira Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” in *Maritime Spatial Planning: Past, Present, Future*, ed. Jacek Zaucha and Kira Gee (Cham, UK: Palgrave Macmillan, 2019), p. 10.

²¹ The UN Ocean Conference to support the implementation of Sustainable Development Goal 14: to conserve and sustainably use the oceans, seas and marine resources for sustainable development. The need for an integrated approach was stressed in the resolution of UNGA/RES/71/312 “Our ocean, our future: call for action.”

vision of protection, production and prosperity.”²² The year 2021 marks the beginning of the UN Decade of Ocean Science for Sustainable Development, where “scientists, policy makers, managers, and service users can work together to ensure that ocean science delivers greater benefits for both the ocean ecosystem and for society.”²³ The research program for the European Union (EU) for 2021-2027, Horizon Europe, includes five mission areas of which healthy oceans is one.²⁴ One of five objectives proposed for this mission is to revamp governance, aiming among other things to “create an integrated and participatory EU-system of ocean and water governance.”²⁵ Multiple national arrangements are in place for the integrated management of marine and coastal ecosystems.²⁶ Accordingly, high political and research ambitions are vested in IOM and the integrated approaches to ocean governance.

1.2 Problematization and research question

Against this background this dissertation problematizes²⁷ the potential of IOM to contribute to protection of the marine environment. The hypothesis is that inherent limitations exist in the potential of IOM to contribute to a broad set of objectives. The scope of the dissertation allows for interrogation of the contribution of IOM to one societal objective, which is the environmental objective of protecting the marine environment. Protecting the marine environment is demanding as well as potentially a competing or conflicting objective alongside economic and social objectives. Could IOM possibly contribute to all three? Perhaps the “management and regulation of ocean activities towards the realization of the healthy, prosperous ocean”²⁸ is overly ambitious?

²² M. et al. Stuchtey, “Ocean Solutions That Benefit People, Nature and the Economy,” (Washington, DC: World Resources Institute, 2020), p. 5 (pdf page no.) and similarly, for example, on given p. 6 (pdf page no. 12).

²³ The Ocean Decade was proclaimed by UNGA/RES/72/73 “Oceans and the Law of the Sea,” (2017). Details on the decade, see Vladimir Ryabinin et al, “The UN Decade of Ocean Science for Sustainable Development,” *Frontiers in Marine Science* 6, no. 470 (2019). The citation is an excerpt from the vision of the Ocean Decade see https://www.oceandecade.org/about#top_of_page.

²⁴ Directorate-General for Research and Innovation (European Commission), “Horizon Europe: The EU Research and Innovation Programme (2021-27),” (2020). Pascal Lamy et al, “Proposed Mission: Mission Starfish 2030: Restore Our Ocean and Waters,” (Report of the Mission Board Healthy Oceans, Seas, Coastal and Inland Waters, 2020).

²⁵ “Proposed Mission: Mission Starfish 2030: Restore Our Ocean and Waters,” p. 44,

²⁶ As per http://msp.ioc-unesco.org/world-applications/status_of_msp/, providing information of marine spatial plans at national level, 30 countries have completed a marine spatial plan, and many more are developing such plans.

²⁷ As per Sandberg and Alvesson, problematizing means “taking something that is commonly seen as good or natural, and turning it into something problematic,” Jörgen Sandberg and Mats Alvesson, “Ways of Constructing Research Questions: Gap-Spotting or Problematization?,” *Organization* 18, no. 1 (2010), p. 32.

²⁸ Yoshinobu Takei, “Demystifying Ocean Governance,” in *Regime Interaction in Ocean Governance*, ed. Seline Trevisanut, Nikolaos Giannopoulos, and Rozemarijn Roland Holst (Leiden, The Netherlands: Brill | Nijhoff, 2020), p. 25. Scott states that “there are inherent limitations in addressing climate change through IOM,” yet concludes that “IOM is a promising tool for integrating climate change into oceans governance,”

Thus, the following overall research question is posed: **What is the potential of integrated ocean management to contribute to protection of the marine environment?**

Essentially, this research question concerns three themes: (1) Disentangling and structuring abstract and practical variants of IOM; (2) Identifying ways of approaching and concretizing protection of the marine environment as a management objective; (3) How to assess the contribution of IOM to protection of the marine environment. These themes capture concepts, objectives, and problems that are important premises for law and governance of the oceans.²⁹ The relationships between the three themes are illustrated in Figure 1.

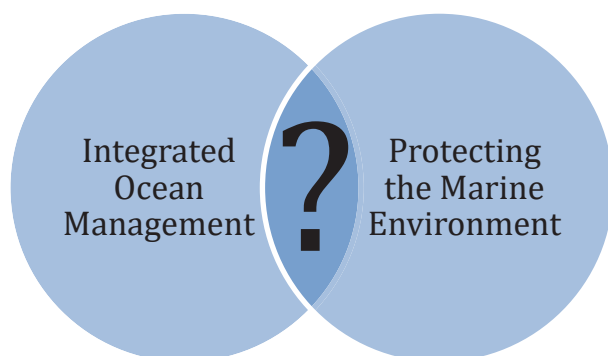


Figure 1: Simple Venn diagram illustrating theme relationships and the overlap to be investigated by this dissertation.

The first theme disentangles the concepts, norms and standards of IOM (Paper I), and the management instruments (Paper II) or regimes (Paper III) that operationalize IOM.³⁰ One way in which integrated approaches to ocean governance differ relate to, as mentioned, the kind of integration in focus. Further, governance and management are broad concepts capturing multiple aspects as section 4.1 will explain in further detail. Thus, integrated approaches to ocean governance could also refer to a variety of different aspects or types of governance and management. Examples include (beyond integrated responses to a broad set of societal objectives) integrating management processes or

Karen N. Scott, “Integrated Oceans Management and Climate Change,” in *Research Handbook on Climate Change, Oceans and Coasts*, ed. Jan McDonald, Jeffrey McGee, and Richard Barnes (Cheltenham, UK: Edward Elgar Publishing, 2020), p. 295.

²⁹ Further, in a similar way to, Sandberg and Alvesson, “Ways of Constructing Research Questions: Gap-Spotting or Problematization?” p. 32, this dissertation perceives that “problematization does not need to involve challenging the assumptions underlying an entire paradigm and, thus, produce a scientific revolution ... It can equally be about challenging some moderate assumptions which underlie existing theories within a particular school of thought or intellectual tradition.” (reference omitted) Where references are omitted in a quote, I write (reference(s) omitted).

³⁰ Josh Martin, “A Transnational Law of the Sea,” *Chicago Journal of International Law* 21, no. 2 (2021), p. 464, “despite its undisputed central placement on the global agenda, the actual meaning, content, and envisioned structure of this new integrated approach to ocean management remains remarkably undefined and under-examined” (reference omitted).

structural integration such as in strengthening (organizational or institutional) cooperation.³¹ In the face of such variety, a need emerged to delimit the research on IOM in three dimensions: which management actor perspectives to include, which type of management to focus on, and which management objective to investigate. The need for these strong delimitations in the face of the variety of integrated approaches to ocean management further spurred the question of the appropriateness of this level of abstraction (why combine these seemingly different perspectives in one concept).³²

The second theme concerns identifying ways of approaching and concretizing protection of the marine environment as a management objective (Papers II and III). This component touches upon the basic question of how to approach complexity. This approach recognizes the complexity of both the marine ecosystems and the management objective (or problem) of protecting them, and addresses the complexity one aspect at a time: first, by separating the environmental objective of protecting the marine environment from the economic and social objectives; second, by distinguishing between an objective and the response to it (in contrast to, for example, conceptualizing objectives and responses in one approach); third, by unpacking and distinguishing between different sub-objectives or problem aspects relevant to protecting the marine environment.³³ Thus, the approach specifies, if not clarifies, different problem aspects and implications of them. For example, approaching how to reduce environmental pressures, such as marine pollution, is different from approaching how to facilitate activities while taking some environmental concerns to limit negative environmental effects into account. Consequently, the approaches require different responses and lead to different outcomes.

The third theme involves how to assess the contribution of IOM to protection of the marine environment. This is addressed by the development and employment of a problem-based approach (Papers II and III). It takes an instrumental view of law as a means to contribute to societal objectives. The approach consists of a problem analysis, and a consistency assessment. Based on the problem analysis, problem aspects of protecting the marine environment are specified and management implications for each problem aspect are deduced. The implications are developed through deductive

³¹ For multiple examples, see Sue Kidd, “Rising to the Integration Ambitions of Marine Spatial Planning: Reflections from the Irish Sea,” *Marine Policy* 39 (2013); Richard Barnes, “The Law of the Sea Convention and the Integrated Regulation of the Oceans,” *International Journal of Marine and Coastal Law* 27, no. 4 (2012). Another example is Voigt, who interprets integration as an absolute priority of protecting the ecosystem, at the expense of other objectives, related to the purpose of sustainable development. Christina Voigt, “The Principle of Sustainable Development: Integration and Ecological Integrity,” in *Rule of Law for Nature*, ed. Christina Voigt (Cambridge: Cambridge University Press, 2013).

³² Similarly see, for example, Margaret Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory* (London: Taylor and Francis, 2017), discussing how some see that complexity in the world cannot “simply be cleaned up by ‘orderly conceptions’,” p. 4 (reference omitted).

³³ Protecting the marine environment could both be described as a societal objective and a societal problem (the problem of how to protect the marine environment). Thus, the terms objective and problem are sometimes used in combination or interchangeably, other times not, depending on whether the aim is to contrast against other societal objectives (where “objective” is used) or to specify its content (where “problem” or “problem aspect” is more often used).

reasoning between, on the one side, a problem aspect, and on the other side, what it requires in terms of scale, knowledge, and responses. The consistency assessment establishes consistency between, on the one hand, problem aspects and implications, and, on the other hand, a case of IOM (Paper II) and an illustrative IOM mandate (Paper III).

Following the brief introduction of the themes, an illustration highlighting the multiple integrated approaches to ocean management and the complexity of protecting the marine environment is provided in Figure 2.

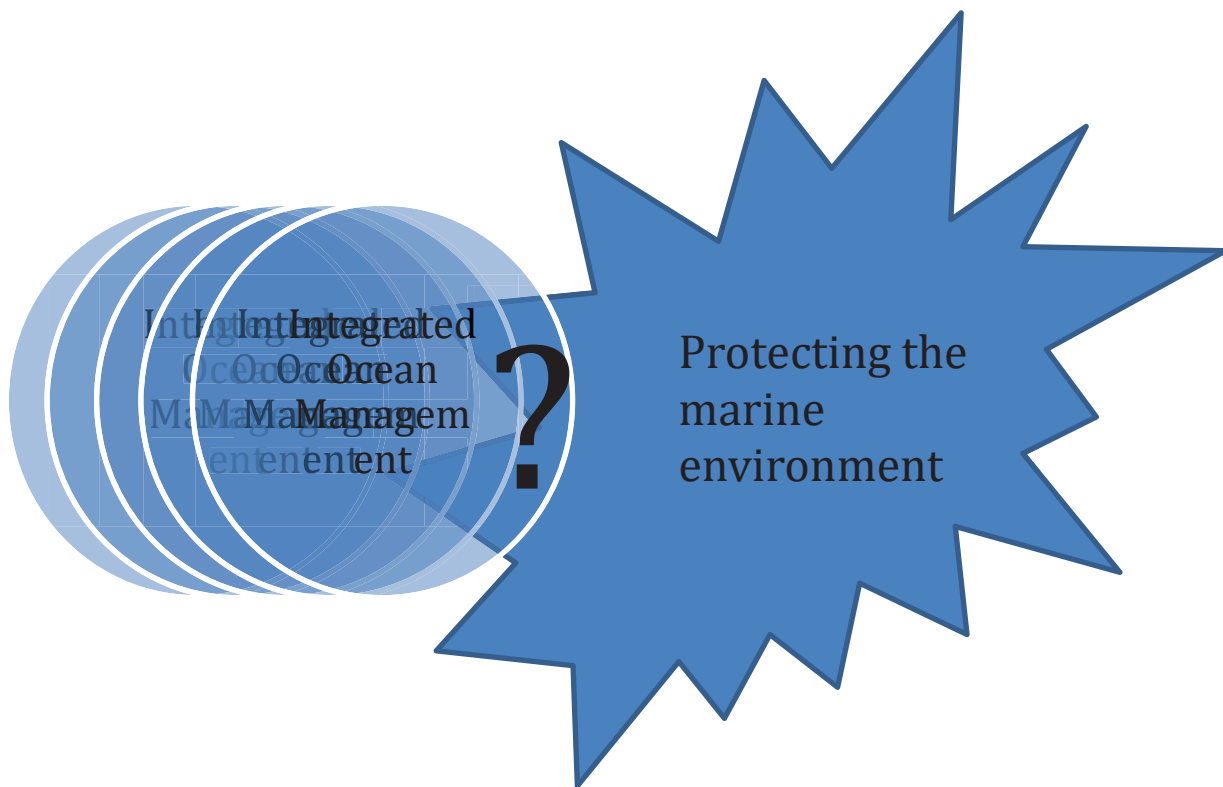


Figure 2: Illustration of themes highlighting the multiple variants of integrated approaches to ocean management and the complexity of protecting the marine environment.

As the partly and fragmented overlap of the illustration suggests, the conclusion of this dissertation is that the potential of IOM to contribute to protection of the marine environment is limited. The approach of this dissertation to protection of the marine environment is not compatible with ocean management in an integrated manner.

2 Research Design

2.1 Overview and roadmap

The research question and a summary of the three themes are presented in Table 1.

Overall research question	The potential of integrated ocean management (IOM) to contribute to protection of the marine environment (PME)		
Themes in brief	What is IOM?	How to approach and concretize PME?	How to assess the contribution? (linking IOM with PME)

Table 1. Overall research question and the three themes in brief. (The abbreviation PME is used in tables only)

This document has three purposes. The first is to discuss and conclude this research question. The second is to show the connection between the three Papers of the dissertation. This is provided for by structuring the discussion in this document through these three themes in a manner that cuts across the three Papers. The themes further contextualize the discussions in the Papers. The third purpose is to expand upon the methodology of the Papers.

For these purposes, this document is structured in the following way. The first theme that concerns IOM (which is introduced in section 1.1) and similar concepts is further discussed in section 3. Findings and reflections to this end are set out in section 6.1.

The second theme that concerns the management objective of protecting the marine environment is presented in section 4. This section explains problem-based management, how it is embedded in “governance,” and how it relates to management structures and process management. Then, the management objective is problematized and concretized in further detail. The findings and reflections on this second theme are provided in section 6.2.

The third theme that involves assessing the contribution of IOM to protection of the marine environment by using a problem-based approach is essentially a matter of method and is discussed in section 5. This section also expands on the other two main methods of the Papers, i.e., the concept analysis and the case study, and how the methodology triangulates.

The findings and reflections on each of the themes in sections 6.1–6.3 lead to the conclusion on the overall research question in section 7. The remainder of this section 2 now presents the research questions of the Papers and the research strategies related to each Papers (in section 2.2). These research strategies combine in the overall research design, of which section 2.3 provides a tabular overview. Finally, section 2.4 includes an overview of disciplinary perspectives.

2.2 Paper research questions and strategies

Paper I interrogates which formal norms, shared understandings, or guiding standards of IOM apply to state-level ocean management. Ruling out the existence of a legally binding specific norm on

integrated ocean management, Paper I employs a concept analysis to identify and analyze concepts and norms that use the term “integrate” and are relevant to state-level ocean management, as evident in international legal and policy documents and instruments. This analysis spurred the question of whether IOM could possibly contribute to a broad set of objectives.

The research question of Paper II is how IOM is operationalized by a state with regard to protection of the marine environment. This is investigated by using a problem-based approach applied to a best practice case of IOM. The strategy is first to unfold some complexities of protecting the marine environment through a problem analysis and identification of three problem aspects (three approaches) that are relevant to the ocean management of states. Paper II explains and contrasts the implications (e.g., scale and responses) of the three approaches. Then, to assess the contribution of the case, the plans that set out the IOM regime are analyzed to assess which of these problem aspects and implications are embedded in them.

The research question of Paper III asks how an illustrative mandate of state ocean management contributes to protection of the marine environment. Through a problem-based approach, Paper III identifies some complexities of protecting the marine environment to focus on one arguably important problem aspect: to reduce the main environmental pressures. Relying on two scientific assessments, Paper III identifies main environmental pressures and discusses the compatibility of the mandate with reducing each of the pressures.

The overview of the research questions and research strategies of the three Papers indicates how the three themes connect and cut across the three Papers. To summarize, the first theme, concerning IOM, is discussed in Papers I, II, and III. The second theme, involving approaches to protection of the marine environment, is discussed in Papers II and III. The third theme, regarding how to link IOM with protection of the marine environment, is also discussed in Papers II and III. In light of this overview, a tabular presentation of research questions, strategies, main methods and data in relation to each Paper, and how they inform the cross-cutting themes, follows in the next section.

A note on ontological position could be appropriate. The literature on ocean governance builds on different ontological positions. This dissertation “basically assume[s] that there is an objective world ‘out there’,”³⁴ focuses on causal relationships in the research question,³⁵ uses documents as evidence,³⁶ relies on the content of documents,³⁷ and criticizes conceptualism “making appeal to the tribunal of facts” (if not scientific assessments).³⁸ Thus, it belongs in the realistic tradition.

³⁴ Lise Justesen and Nanna Mik-Meyer, *Qualitative Research Methods in Organisation Studies* (Copenhagen: Hans Reitzels Forl, 2012), p. 18.

³⁵ *Ibid.*, p. 24.

³⁶ *Ibid.*, p.125.

³⁷ *Ibid.*, pp.122 and 125.

³⁸ Pierluigi Chiassoni, *Interpretation without Truth: A Realistic Enquiry* (Cham, UK: Palgrave Macmillan, 2019), p. 1.

2.3 Tabular overview of research design

Overall research question	The potential of integrated ocean management (IOM) to contribute to protection of the marine environment (PME)		
	Paper I	Paper II	Paper III
Paper research questions	Which formal norms, shared understanding, or guiding standards of IOM apply?	How is IOM operationalized as concerns protection of the marine environment?	To what extent could an illustrative mandate of state ocean management contribute to protection of the marine environment?
Paper research strategy	Identify and analyze concepts and norms of IOM. Focus on integrated approaches related to state-level ocean management in international legal and policy documents and instruments.	Unfold complexities of PME by problem analysis and identification of three problem aspects with diverging implications (three approaches). Use these as criteria against which to assess adherence. Select a best practice case of IOM, to assess adherence and consequent contribution.	Expose an illustrative mandate of ocean management. Recognize complexities of PME, to focus on one problem aspect: to reduce the main environmental pressures. Identify two set of main environmental pressures. Discuss how the mandate fits with reducing each of the pressures.
Main methods	<ul style="list-style-type: none"> • Concept analysis 	<ul style="list-style-type: none"> • Problem-based approach • Case study/content analysis 	<ul style="list-style-type: none"> • Problem-based approach
Main data	<ul style="list-style-type: none"> • International legal and policy documents • Scholarly literature 	<ul style="list-style-type: none"> • Integrated marine management plans of Norway • Scholarly literature 	<ul style="list-style-type: none"> • World Ocean Assessment, IPBES report • Scholarly literature
Cross-cutting themes			
What is IOM?	IOM as concepts and norms (IOM as it shall or should be)	IOM as a case or an operating instrument (IOM as it is)	IOM as illustrative mandate (IOM as it could be)
PME approach	<i>Out-of-scope</i>	Problem analysis. Identifying three problem aspects or approaches.	Identifying core problem aspect (reducing environmental pressures)
Linking IOM with PME	By statement	Aligning the three approaches and implications with a case of IOM	Consider compatibility of illustrative IOM mandate with reducing environmental pressures

Table 2. Overview of the research design.

2.4 Disciplinary perspectives

The concepts, objectives and problems of this dissertation are multidisciplinary and they have implications for law and governance. The approach of this dissertation does not fit within the traditional boundaries of legal research. Yet, in the words of systems thinkers Meadows and Wright, “(t)he right boundary for thinking about a problem rarely coincides with the boundary of an academic discipline.”³⁹ This section now presents some disciplinary perspectives that this dissertation traverses. The purpose is to provide an overview and some of these perspectives will be revisited.

Ocean governance is the thematic perspective and field of study of this dissertation. Ocean governance as a research theme is evident in the overall research question and the fact that the target audience of the three Papers that are ocean governance scholars and practitioners. Being a thematic meeting point of multiple disciplines, ocean governance is a natural field of study for interdisciplinary endeavor and methodological heterogeneity.⁴⁰ Current scholarship discusses ocean governance from a plethora of disciplinary and thematic perspectives, often in combination. These perspectives include marine ecology, marine resource management, marine (or maritime) activities management, and marine legal perspectives (including the law of the sea and environmental law). These perspectives stretch from the natural science to the social science realms, yet many perspectives do not fall strictly within these realms. Belonging in both realms make ocean governance particularly apt for studying how knowledge about the natural environment (ocean) could or could not fill the knowledge needs of management (governance). The linking of these two knowledge domains is essential in approaching how to protect the marine environment (section 4.4, Paper II). It should, however, be noted that ocean governance captures complexities and intricacies,⁴¹ of which this dissertation only looks at fragments.⁴²

³⁹ Donella H. Meadows and Diana Wright, *Thinking in Systems: A Primer*, (White River Junction, Vermont: Earthscan, 2009), p. 98.

⁴⁰ Similarly, with regard to the call for interdisciplinarity, expressed in relation to human rights studies, Malcolm Langford, “Interdisciplinarity and Multimethod Research,” in *Research Methods in Human Rights: A Handbook*, ed. Bård A. Andreassen, Hans-Otto Sano, and Siobhán McInerney-Lankford (Cheltenham, UK: Edward Elgar Publishing, 2017), pp. 1–2. Similarly, with regard to the theme’s call for interdisciplinarity, Ehler, Zaucha, and Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” p. 2: “The imperative for employing a multidisciplinary approach stems from the nature of marine space as a multi-dimensional concept requiring insight from many scientific disciplines and types of knowledge.”

⁴¹ Antonia Zervaki, “The Ecosystem Approach and Public Engagement in Ocean Governance the Case of Maritime Spatial Planning,” in *The Ecosystem Approach in Ocean Planning and Governance: Perspectives from Europe and Beyond*, eds. David Langlet and Rosemary Rayfuse, (Leiden: BRILL, 2019), p. 223.

⁴² For example, the scholarly literature on the thematic field of study is vast. With regard to one of the many concepts of ocean governance, marine spatial planning (MSP), “[a]cademic interest ... has grown exponentially over the past decade. A November 2017 search of the ‘Web of Knowledge’ of the Institute for Scientific Information (ISI) found over 900 scientific Papers on MSP published in international peer-reviewed journals and almost 10,000 articles in Google Scholar when searching for ‘marine spatial planning’ alone.” Ehler, Zaucha, and Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” p. 1 (reference omitted).

As with any discipline or field of study,⁴³ ocean governance is characterized by a number of concepts. Section 3 elaborates on IOM and other concepts of ocean governance. The ways in which these concepts influence and enrich law could justify a comment. The concepts of ocean governance find their way into the legal sphere in various ways. Being essentially ideas, these concepts serve as a source of inspiration, as, for example, both IOM and marine spatial planning existed as concepts prior to manifesting themselves in legal instruments.⁴⁴ Other concepts, such as blue growth⁴⁵ and blue doughnut,⁴⁶ may inspire but have still to manifest in legal instruments. The concepts of IOM have manifested in the legal sphere in at least two different ways. The first is by transition into international legal treaties and policy texts as norms or standards, two examples of which are discussed in Paper I. Another way that concepts of IOM have transited into law is as a national regulatory or management instrument, such as a plan or policy. The integrated marine management plans (IMM plans)⁴⁷ discussed in Paper II constitute one such example.

The next disciplinary perspective is that of international environmental law. Brunnée describes IEL in the following way:

international environmental law is a relatively pragmatic discipline, focused on problem solving, ... Seen from this vantage point, whether a given approach is 'law' in the traditional

⁴³ Sanne Taekema and Bart van Klink, "On the Border, Limits and Possibilities of Interdisciplinary Research," in *Law and Method: Interdisciplinary Research into Law*, ed. Bart van Klink and Sanne Taekema (Tübingen: Mohr Siebeck, 2011), p. 8.

⁴⁴ For IOM, see Paper I. Marine (or maritime) spatial planning is manifest in, for example, Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning *OJ L 257, 28.8.2014, p. 135–145*.

⁴⁵ For example, Dane H. Klinger et al, "The Mechanics of Blue Growth: Management of Oceanic Natural Resource Use with Multiple, Interacting Sectors," *Marine Policy* 87 (2018).

⁴⁶ Louise Lieberknecht, "Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development," (GRID-Arendal, 2020), p. 10.

⁴⁷ These seven plans, in reverse chronological order, are "Integrated Management Plan for the Norwegian Marine Areas. Report Nr. 20 to the Storting," (2019-2020); "Integrated Management Plan for the Marine Environment of the Norwegian Sea, First Update. Report to the Storting No. 35," (2016-2017); "Integrated Management Plan for the Barents Sea-Lofoten Area, Second Update. Report to the Storting No. 20," (2014-2015); "Integrated Management of the Marine Environment of the North Sea and Skagerrak (Management Plan). Report to the Storting No. 37," (2012-2013); "Integrated Management Plan for the Marine Environment of the Barents Sea-Lofoten Area, First Update. Report to the Storting No. 10," (2010-2011); "Integrated Management of the Marine Environment of the Norwegian Sea (Management Plan). Report No. 37 to the Storting," (2008-2009); "Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas Off the Lofoten Islands (Management Plan). Report No. 8 to the Storting," (2005-2006). Details on availability in the reference list. English versions of some plans exist, available at <https://nettarkiv.miljodirektoratet.no/hoeringer/tema.miljodirektoratet.no/no/Havforum/Forside/English/index.html>. The abbreviation IMM plans refers to all seven plans. Section 5.4.2 describes these plans in more detail.

sense may be secondary. What matters is which approach is best suited to achieving the desired results in a given context.⁴⁸

The approach undertaken in this dissertation focuses on problem solving (or contribution) and does not focus on law in the traditional sense, but rather as an articulated standard (Paper I) and as an instrument to govern behavior (Papers II and III).⁴⁹ Thus, it may fit with this pragmatic approach to IEL. Further, discussing the maturity and methodology of IEL, Fisher et al. explain different ways in which IEL is interdisciplinary:

The fourth reference to interdisciplinarity in environmental law scholarship is really a reference to the need to develop a new discipline to deal with environmental problems. Such a new discipline transcends traditional disciplinary boundaries, which are barriers to effectively addressing environmental problems.⁵⁰

Thus, as this dissertation deals with environmental pressures (such as marine pollution and increased use of marine space), it could be perceived as interdisciplinary IEL if not a new discipline.⁵¹ Furthermore, Fisher et al. maintain how “scholars have consistently highlighted the complex nature of those problems ... [which] include methodological issues.”⁵² Section 5.3.2 discusses methodological approaches to complexity and position itself alongside some approaches of other legal (environmental) scholars. It remains to note that some scholars have highlighted the inadequacy of IEL to respond to the global environmental problems.⁵³ Thus, the approach of this dissertation will also briefly be aligned with the Earth system law approach, which represent one of the new approaches to law and nature (section 5.3).

The next disciplinary perspective to emphasize, I have roughly categorized as macro legal perspectives. The approach undertaken in this dissertation involves a macro analysis by investigating

⁴⁸ Jutta Brunnée, “Sources of International Environmental Law: Interactional Law,” ed. Samantha Besson and Jean d Aspremont, *The Oxford handbook of the sources of international law* (Oxford: Oxford University Press, 2018), p. 967 (references omitted).

⁴⁹ Section 5.1 comments on perceptions of law.

⁵⁰ Elizabeth Fisher et al, “Maturity and Methodology: Starting a Debate about Environmental Law Scholarship,” *Journal of Environmental Law* 21, no. 2 (2009), p. 234.

⁵¹ Fisher et al. moves on to mention transdisciplinarity, *ibid*, p. 234. The attempt of this dissertation to combine real-world problems with law could vaguely resemble transdisciplinarity, yet a transdisciplinary approach would often involve (stake)holders of non-academic knowledge in all or some steps of the research process, see, for example, Romina Rodela and Åsa Gerger Swartling, «Environmental Governance in an Increasingly Complex World: Reflections on Transdisciplinary Collaborations for Knowledge Coproduction and Learning,” *Environmental Policy and Governance* 29, no. 2 (2019). In this sense, the dissertation is not transdisciplinary.

⁵² Fisher et al, “Maturity and Methodology: Starting a Debate About Environmental Law Scholarship,” p. 217.

⁵³ Vito De Lucia, “The 'Ecosystem Approach' in International Environmental Law: A Biopolitical Critique” (UiT The Arctic University of Norway, 2015), p. 49; Louis J. Kotzé, “Earth System Law for the Anthropocene,” *Sustainability* 11: 6796, no. 23 (2019).

problems of global scale and consistent management intervention (section 4.4). Turner inquires for macro legal analysis to evaluate global environmental governance and to develop coherent strategies for its further development.⁵⁴ The approach undertaken by this dissertation investigates global marine environmental problems to develop consistent implications for management, which roughly respond to this inquiry. Further, Little argues for “novel” environmental legal scholarship (contrasting “classic”), exploring the relationship between environmental governance and regulation and environmental science, which “offers the exciting prospect of more direct engagement with the big themes and issues in environmental debate.”⁵⁵ This dissertation analyzes how governance or regulation, as per an ocean management mandate (Paper III) or as per the IMM plans (Paper II) engage with main environmental problem aspects and pressures. Thus, in this sense it could be perceived as “novel” (big issue) legal scholarship. Section 5.3.2 elaborates on further similarities and differences.

Other macro perspectives include the vision of global legal scholarship of Larouche.⁵⁶ Larouche argues that legal scholarship should be post-national, inter-disciplinary, and strongly linked to reality.⁵⁷ By post-national, Larouche “impl[ies] that [scholarship] should rise above national legal systems and cover a more abstract corpus of knowledge about law, of which national legal system would be an application.”⁵⁸ This resembles the approach of this dissertation, which offers marine and environmental management perspectives that are relevant to multiple national legal and governance systems. Finally, Burg suggests how we need “interdisciplinary scholars ... fully equipped with a wide range of disciplinary expertise ... [and] the audacity to formulate evaluations and normative recommendations.”⁵⁹ This dissertation includes different disciplinary perspectives, it offers relevant intervention targets for evaluation and design of environmental management and regulation (Paper II, sections 5.5 and 6.2.3), and it outlines responses that could qualify as recommendations (Paper III). Thus, this dissertation could be perceived as an attempt of “macro legal analysis,” “novel” (big issue) legal scholarship, global legal scholarship, and fully armed interdisciplinary scholarship.

The final disciplinary perspective to be highlighted is how this dissertation leans into the scholarship of social science. A focus on problem-based management, vested in concepts of governance and management, is one way in which this dissertation relates to social science. Further, a prime inspiration for, and influence on, this dissertation from the social science scholarship has been the methodological literature (section 5). Both the concept analysis and the case study approach of this

⁵⁴ Stephen J. Turner, “The Use of 'Macro' Legal Analysis in the Understanding and Development of Global Environmental Governance,” *Transnational Environmental Law* 6, no. 2 (2017), p. 238.

⁵⁵ Gavin Little, “Developing Environmental Law Scholarship: Going Beyond the Legal Space,” *Legal Studies* 36, no. 1 (2016), p. 61 (noting that Little discusses UK legal scholarship).

⁵⁶ Pierre Larouche, “A Vision of Global Legal Scholarship,” *Tilburg Law Review* 17 (2012).

⁵⁷ *Ibid.*, p. 207.

⁵⁸ *Ibid.*, p. 206.

⁵⁹ Wibren van der Burg, “The Need for Audacious, Fully Armed Scholars: Concluding Reflections,” in *Facts and Norms in Law: Interdisciplinary Reflections on Legal Method*, ed. Sanne Taekema, Bart van Klink, and Wouter de Been (Cheltenham, UK: Edward Elgar Publishing, 2016), p. 278.

dissertation are methods that are well known both in legal and social science scholarship. Yet, I have found inspiration in the rich methodological literature of social science. It provides detailed descriptions of how to design and apply various methods. This has inspired the approach and presentation of the methods in section 5.

This section has shown how this dissertation traverses many different disciplinary perspectives. This indicates that on the methodology front, it is in “broad exploration” mode (unlike “fine-tuning” mode).

3 Concepts of Ocean Governance: IOM and Beyond

As per the previous section, the term “ocean governance” is used to denote the theme and the field of study of which this dissertation belongs. For this reason, it also becomes a convenient umbrella term, under which the other concepts can be grouped, such as “concepts of ocean governance.” This further entails that “ocean governance” is not dealt with as a concept on its own (even though some versions of it could resemble IOM).

The term “concept” means a set of abstract ideas (which may or may not be reconcilable in all aspects) that is constructed by high-level generalization.⁶⁰ The term “concepts” is used interchangeably with “approaches,” such as “integrated approaches to ocean governance.” Concepts are a core feature of ocean governance. Moreover, Takei explains how the “link between an integrated/coordinated approach and ocean governance appears particularly strong.”⁶¹ Section 3.1 elaborates on some justifications in the scholarly literature for integrated concepts of ocean governance. Then, section 3.2 shows how differently phrased concepts are used in combination. Section 3.3 provides the set of concepts that I associate with ocean governance. Then, section 3.4 select three concepts, beyond IOM, to identify some similarities with IOM in section 3.5.

3.1 A critical view of some common reasons for integration

As section 1.1 briefly noted, integrated approaches to ocean governance are promoted or justified for multiple reasons. This section expands on some of these justifications. At any time, not only do problems exist that seek solutions, but solutions exist that seek problems.⁶² One could plausibly argue that “any” problem is better off addressed in integration. Along these lines, Paper I opens by presenting the need for sustainable resource use and some threats to the marine environment. Then, in response to the selected problems and objectives, integrated approaches to ocean governance or similar concepts are suggested.⁶³

⁶⁰ As in this dissertation, “[i]n theories and experiments on concept formation, the terms generalization and abstraction are often used in an equivocal sense,” E. A. Peel, “Generalizing and Abstracting,” *Nature* 230, no. 5296 (1971), in abstract.

⁶¹ Takei, “Demystifying Ocean Governance,” p. 25. Noting, however, that integrated approaches are not the only ones that stand out. Langlet and Rayfuse maintain that the “ecosystem approach has come to feature particularly strongly in the context of marine management,” David Langlet and Rosemary Rayfuse, “The Ecosystem Approach in Ocean Planning and Governance: An Introduction,” in *The Ecosystem Approach in Ocean Planning and Governance: Perspectives from Europe and Beyond*, eds. David Langlet and Rosemary Rayfuse, (Leiden: BRILL, 2019), p. 2.

⁶² Johan P. Olsen, *Politisk Organisering: Organisasjonsteoretiske synspunkt på folkestyre og politisk ulikhet*, Publikasjoner (Maktutredningen) (Bergen: Universitetsforlaget, 1978), p. 87; Magnus Elias Eilertsen, «Kunnskap, kaos og kompromisser, en studie av de politiske beslutningsprosessene knyttet til spørsmålet om eventuell petroleumsvirksomhet utenfor Lofoten og Vesterålen.» (UiT The Arctic University of Norway, 2016), p. 28.

⁶³ Further examples include “Achieving greater integration and coherence in MSP [marine spatial planning] governance arrangements is seen as a way to resolve current problems of marine governance (such as

Another example illustrating the flexibility of integration, is provided in a report by Lieberknecht on ecosystem-based integrated ocean management:

EU research funding focused on blue growth has recently given rise to academic literature that goes as far as re-casting integrated ocean management and related concepts (such as MSP)[marine spatial planning] mainly as vehicles for economic growth. ... This framing is starkly different from that of most ecosystem-based ocean management literature ..., in which integrated management concepts are conceived and framed primarily as approaches for safeguarding the environment and ensuring human wellbeing within safe ecological limits.⁶⁴

Thus, the flexibility of integrated approaches to ocean management concepts allows for framing these both as approaches to safeguard the environment and as vehicles mainly for economic objectives.

This brings us to the justifications of integrated approaches as relevant solutions to societal objectives and problems. Facilitated by the flexibility offered by the approaches, I suggest that they are offered as solutions to societal problems and objectives in part because the problems and objectives are complex. The problems and objectives of the ocean could be perceived as embedded in the complexity of the socio-ecological systems,⁶⁵ whether expressed as such or by different term embracing humans and nature and their interconnection (such as ecocentric or ecosystem-oriented). Exposing the problems and objectives and designing responses to this complexity could appear insurmountable. Thus, the plausible response of integration, suitable for any problem, is attractive. However, the question remains whether integrated approaches is an appropriate response to complex societal problems and objectives. Section 4.1 elaborates on the complexity of governance, section 4.2-4.6 on the complexity of protecting the marine environment, and section 5.3.2 on approaching complexity.

fragmentation) and address future resource demands in a sustainable way.” Sue Kidd et al, “Marine Spatial Planning and Sustainability: Examining the Roles of Integration - Scale, Policies, Stakeholders and Knowledge,” *Ocean & Coastal Management* 191: 105182 (2020), in abstract; “Climate change, in combination with population growth (...) is threatening sustainability and societal wellbeing. Responding to these complex and synergistic challenges requires holistic management arrangements. To this end, ecosystem-based management (EBM) promises much by recognising the need to manage the ecosystem in its entirety, including the human dimensions” (author’s emphasis), K. A. Alexander et al, “Progress in Integrating Natural and Social Science in Marine Ecosystem-Based Management Research,” *Marine and Freshwater Research* 70, no. 1 (2019), in abstract. “There is an urgent need for a fundamental shift in the way we manage our oceans and coasts towards a holistic and integrated approach to management,” Stelios Katsanevakis et al, “Ecosystem-Based Marine Spatial Management: Review of Concepts, Policies, Tools, and Critical Issues,” *Ocean & coastal management* 54, no. 11 (2011), p. 808.

⁶⁴ Lieberknecht, “Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development,” p. 9 (references omitted).

⁶⁵ Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 351.

One could also suggest that integration is a response to fragmentation. Fragmentation is as flexible a problem as integration is a response, as one could plausibly argue that any problem is worse off addressed in fragmentation. Fragmentation is offered as a problem, for example, of management, sectors, regulation, institutions, or maritime zones.⁶⁶ Although this dissertation does not focus specifically on fragmentation, many of the problems framed as fragmentation are nonetheless addressed, as will be explained. Highlighting fragmentation in marine governance in three different ways, Charles explains:

Conventional decision-making about human uses of the oceans has had two major characteristics: it has taken place in a top-down manner, typically by a governmental authority, and it has occurred on a sector by sector basis, for example, for the fishery sector separately from shipping, tourism and other sectors. These two attributes led to a lack of support for management (since ocean users did not support the top-down rules) and fragmented, uncoordinated decision-making, as well as a lack of attention to cumulative environmental impacts (given the “silo” nature of management).

Governance involves decision-making, including not only the specifics of the possible decisions themselves, but also who makes the decisions, what processes are used for this, and what is to be included for consideration. Modern good governance shifts decision-making toward participatory processes, collaborative or shared co-management, and ecosystem-oriented integrated management that creates multi-stakeholder institutions (i.e. organizations)

⁶⁶ For example, “IOM and MSP tools offer the best hope for overcoming fragmentation and responding to climate change mitigation and adaptation imperatives,” Jan McDonald, Jeffrey McGee, and Richard Barnes, “Oceans and Coasts in the Era of Anthropogenic Climate Change,” in *Research Handbook on Climate Change, Oceans and Coasts*, ed. Jan McDonald, Jeffrey McGee, and Richard Barnes (Cheltenham, Gloucestershire, United Kingdom: Edward Elgar Publishing Limited, 2020), p. 20; “However, at all levels of oceans governance—national, regional, and global—it is now recognized that fragmented and sector-based management ‘is a major contributor to deteriorating ocean health’,” Karen N. Scott, “Integrated Oceans Management: A New Frontier in Marine Environmental Protection,” in *Oxford Handbook of the Law of the Sea*, ed. Donald R. Rothwell, et al. (Oxford: Oxford University Press, 2015), pp. 488–89 (reference omitted); “[T]he primary *governance* threat to marine ecosystem resilience: regulatory fragmentation.” Robin Kundis Craig and Terry P. Hughes, “Marine Protected Areas, Marine Spatial Planning, and the Resilience of Marine Ecosystems,” in *Social-Ecological Resilience and Law*, ed. Ahjond Garmestani and Craig Allen (New York, United States: Columbia University Press, 2014), p. 105. Further examples include Klinger et al, “The Mechanics of Blue Growth: Management of Oceanic Natural Resource Use with Multiple, Interacting Sectors,” p. 356 and Elise Johansen, “Norway’s Integrated Ocean Management: A Need for Stronger Protection of the Environment?” *Ocean Yearbook Online* 32, no. 1 (2018), p. 242. However, Seline Trevisanut, Nikolaos Giannopoulos, and Rozemarijn Roland Holst, “Chapter 8 Conclusion: Proposing a Three-Fold Approach to Regime Interaction in Ocean Governance,” in *Regime Interaction in Ocean Governance*, ed. Seline Trevisanut, Nikolaos giannopoulos, and Rozemarijn Roland Holst (Leiden, The Netherlands: Brill | Nijhoff, 2020), p. 232, highlight the need for integration in ocean governance, yet also concludes that “fragmentation *per se* is not necessarily the root cause of many of the challenges and limitations of regime interaction in current ocean governance that the contributors have discussed.”

to help in resolving conflicts among users while providing suitable environmental protection.⁶⁷

The first fragmented aspect is the shift from top-down management to multi-stakeholder inclusive decision-making processes. Section 4.1.4 discusses process management and section 4.3 how inclusive processes may promote different objectives. The second fragmented aspect is that the sectoral approach is stated to have led to fragmented, uncoordinated decision-making. Clearly, uncoordinated and fragmented sectoral management of marine activities is suboptimal. These sectors have some common interfaces, such as operating at sea, which justifies coordination to the extent operations overlap in time and space. Yet, on the other hand, there are clear differences between those sectors mentioned by Charles. For example, it appears inappropriate to co-manage the issues of how to distribute cod quotas between countries, which tourists a country would want to attract, and which offshore renewable energy sources to prioritize. Bilateral distribution of cod quotas could, for example, more appropriately be co-managed with other fisheries or bilateral affairs between those two countries. Which tourists a country wants to attract could be co-planned with which infrastructure the country wants to facilitate, whether airports or train tracks. Which offshore renewable energy source to prioritize could appropriately be dealt with in combination with the issue of which mix of energy sources, which energy infrastructure and which energy consumption a country wants to facilitate. These examples show how cross-sectoral management of tourism, fisheries, shipping, and other marine sectors is not appropriate in all aspects.

The third fragmented aspect as suggested by Charles is the lack of attention to cumulative environmental impacts, which ecosystem-oriented integrated management would help resolve. In heavily used areas, for example, it makes sense to consider the total load of this use on this area. Nevertheless, the impacts on the environment of the sectors Charles mentions (fisheries, shipping, tourism, and other marine sectors), throughout their life cycles, would include local waste, physical disturbance and use of space impacts (at sea and on shore), resource outtake, global pollution and carbon dioxide (CO₂) impacts. Thus, the impacts vary in scale and nature, some traceable at sea, some on land, and some only in aggregation (such as CO₂), if traceable at all. These impacts could be perceived as a result of the demand for the activity (such as fisheries meeting a demand for food), of the regulation of fisheries throughout their lifecycle, or of the available substitutional goods and services (such as other sources of food and employment). In light of these circumstances, the question thus remains which of these impacts, such as from fisheries, would be appropriately attended to in combination with impacts from shipping, tourism, and other marine sectors. Finally, Charles suggests that such integrated management responding to these fragmented aspects will be “providing suitable environmental protection.”⁶⁸ However, the question remains whether environmental protection is a matter of top-down management, uncoordinated management, and a lack of attention to cumulative impacts.

⁶⁷ Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 352 (references omitted).

⁶⁸ *Ibid*, p. 352.

This discussion of some justifications for integrated approaches has questioned whether “any” problem is better off addressed in integration, thus demanding further analysis of the relevance of integrated approaches to different problems and objectives. This supports the relevance of the research question that interrogates how IOM contributes to protection of the marine environment. The next section will identify versions of other concepts that the research question is relevant to.

3.2 Combined use of concepts – consequences for relevance

As evident in the examples in the previous section, some concepts are referred to in combination with or are seemingly interchangeable with IOM. Examples of combinations include the first of the IOM concepts of Paper I that “relies on the ecosystem approach.” Another example is evident in the report title: “Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development.”⁶⁹ The concepts of ocean governance are perceived as “a conglomerate of approaches that complement and reinforce each other.”⁷⁰ The concepts are elusive in the sense that generally no uniform definition or use exist that explain their premises. Four examples from the scholarly literature will now be presented to illustrate combinations and different uses. First, Scott, in “Integrated Oceans Management: A New Frontier in Marine Environmental Protection,” deconstructs

IOM into its principal components, which are common to integrated oceans policy at both the national and the regional level. These components, which constitute principles and concepts in their own right comprise: ecosystem-based management; the precautionary approach; environmental impact assessment (EIA); and spatial planning, which may include a focus on the coastal/marine interface and will commonly provide for a system of marine protected areas (MPAs). Finally, IOM necessarily requires a level of institutional coordination ...⁷¹

Second, in *The Ecosystem Approach in Ocean Governance and Planning*, Gilek et al. explain how

marine spatial planning (MSP) has been heralded by a wide range of actors in policy and science alike as a policy process that could enable a balancing of various interests and policy objectives to promote sustainable marine governance and, hence, sustainable development (SD) in marine and coastal areas. Spurred by these aspirations, MSP is a growing global phenomenon that is increasingly being applied as a means of sustainable marine governance. Integral to this optimism of MSP processes as a way to achieve a more sustainable use of marine resources and territory without transcending environmental thresholds, is the notion

⁶⁹ Lieberknecht, “Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development.”

⁷⁰ This citation is related to “Ecosystem-Based Integrated Ocean Management” (unlike concepts of ocean governance, yet the former is defined in a manner capturing many of the concepts of ocean governance as per section 3.3), see *ibid*, p. 12.

⁷¹ Scott, “Integrated Oceans Management: A New Frontier in Marine Environmental Protection,” p. 467.

that this is best achieved by basing MSP practices on the principles of the so-called Ecosystem(-based) Approach (EA)⁷²

Third, Kidd et al., in “Marine Spatial Planning and Sustainability: Examining the Roles of Integration - Scale, Policies, Stakeholders and Knowledge” state that

[h]ow integration is exercised in these procedural aspects of MSP is likely to substantively affect outcomes both in terms of sustainable blue growth or the ability to deliver an ecosystem-based approach.⁷³

Fourth, Singh and Jaeckel in *Handbook on Marine Environment Protection: Science, Impacts and Sustainable Management* explain that:

[o]cean governance involves the application of a number of governance norms and principles as well as management tools in an integrated and cross-sectoral manner. ... [T]wo prominent examples are: (1) ecosystem-based management; and (2) the precautionary approach. [T]he necessary area-based tools to achieve them ... are: (1) marine spatial planning and (2) marine protected areas. Together, these components are necessary for effective management and governance of the oceans.⁷⁴

These examples illustrates how different scholars use and combine the concepts in different ways. They are differently labelled whether as components, means, norms, principles, or tools.⁷⁵ They all revolve around furthering ocean governance or marine management.⁷⁶ To deal with this entanglement, this dissertation has chosen to approach integrated approaches to marine management and specifically the kind of integration that addresses responding or contributing to a broad set of

⁷² Michael Gilek, Fred Saunders, and Ignè Stalmokaitè, “The Ecosystem Approach and Sustainable Development in Baltic Sea Marine Spatial Planning: The Social Pillar, a ‘Slow Train Coming’,” in *The Ecosystem Approach in Ocean Planning and Governance*, ed. David Langlet and Rosemary Rayfuse (Leiden, Boston: BRILL, 2018), p. 160.

⁷³ Kidd et al, “Marine Spatial Planning and Sustainability: Examining the Roles of Integration - Scale, Policies, Stakeholders and Knowledge,” in abstract.

⁷⁴ Pradeep Singh and Aline Jaeckel, “Future Prospects of Marine Environmental Governance,” in *Handbook on Marine Environment Protection: Science, Impacts and Sustainable Management*, ed. Markus Salomon and Till Markus (Cham, UK: Palgrave Macmillan, 2018), p. 624.

⁷⁵ Some of these labels could reflect strategies or measures, such as means and tools, others could reflect principles or standard setting, and some reflect neither of these categories. Evidently, each author uses these labels in their own way, thus, different labels could be used for the same thing. For example, some use the term “tool” as a means or measure, yet for others, a tool is a framework, e.g., Linda Höglund et al, “Strategic Management in the Public Sector: How Tools Enable and Constrain Strategy Making,” *International Public Management Journal* 21, no. 5 (2018), p. 823, tool is “a generic name for frameworks, concepts, models, or methods.” (reference omitted). For this reason, I am not focusing on these labels.

⁷⁶ For example, as evident in these phrases from the aforementioned excerpts, “necessarily requires,” “as a means to,” “as a way to achieve,” “affect outcomes,” “necessary for effective management.”

objectives (IOM). Nonetheless, others may use integrated approaches to ocean governance and the IOM abbreviation differently and, consequently, in ways in which the discussion and conclusion of this dissertation will not apply.

Furthermore, having chosen this kind of integration (of responding or contribution to a broad set of objectives relevant to ocean management), certain other concepts emerge as similar to IOM in capturing it. Thus, the discussion and conclusions of this document are relevant to (versions of) other concepts. It remains to note that the terminology of each of the Papers and their relevance for different concepts is set out in each paper in light of its research question and strategy.

3.3 Listing and selection of concepts

This section lists multiple concepts of ocean governance and explains why some are selected for further investigation. Paper I identifies two concepts, of which only one of them capture the kind of integration in focus (IOM). The second concept of Paper I is the incorporation of environmental, economic, and social concerns into an (ocean management) policy. It deals with concerns, which is more restrictive than objectives (as per Paper II, section 4.3 and 4.4 will explain this in more detail). A more narrow version of this concept (integrating environmental considerations), based on the CBD text, qualifies as a legally binding norm.⁷⁷ I refer to this version as the integration principle.⁷⁸ The integration principle is not specific to ocean management, but relevant to any sectoral or cross-sectoral plan, program or policy (Paper I).

The selected concepts beyond IOM are (certain versions of) the ecosystem approach to ocean governance, marine environmental management approaches, and marine spatial planning. For convenience, I regard these three the concepts similar to IOM. In addition to the aforementioned three concepts, I will list two sets of concepts that I associate with ocean governance. The first set of concepts are adaptive ocean governance,⁷⁹ environmental impact assessments,⁸⁰ marine protected areas,⁸¹ and, the precautionary approach.⁸² These concepts presumably address facets of

⁷⁷ CBD art. 6 (b). As Paper I explain, other variants of the norm include integrating economic and social concerns alongside the environmental, yet this variant is not legally binding.

⁷⁸ On the integration principle in EU law, see Jans, “Stop the Integration Principle.”

⁷⁹ For example, Lucy Greenhill, Jasper O. Kenter, and Halvor Dannevig, “Adaptation to Climate Change–Related Ocean Acidification: An Adaptive Governance Approach,” *Ocean & Coastal Management* 191: 105176 (2020); Arthur Omondi Tuda, Salit Kark, and Alice Newton, “Polycentricity and Adaptive Governance of Transboundary Marine Socio-Ecological Systems,” *Ocean & Coastal Management* 200: 105412 (2021).

⁸⁰ For example, Gunnar Sander, “International Legal Obligations for Environmental Impact Assessment and Strategic Environmental Assessment in the Arctic Ocean,” *The International Journal of Marine and Coastal Law* 31, no. 1 (2016).

⁸¹ For example, Ingvild Ulrikke Jakobsen, “Introduction,” in *Marine Protected Areas in International Law: An Arctic Perspective* (Leiden: Brill | Nijhoff, 2016), p. 5.

⁸² For example, Bénédicte Sage-Fuller, *The Precautionary Principle in Marine Environmental Law: With Special Reference to High Risk Vessels*, Routledge Research in International Environmental Law (London: Routledge, 2013).

management, as opposed to the more comprehensive IOM and concepts similar to IOM that focus on management, governance, and planning in a broader sense.

The second set of concepts are sustainable development or the more recent sustainable ocean economy,⁸³ sustainable ocean,⁸⁴ blue economy,⁸⁵ blue growth,⁸⁶ and blue doughnut.⁸⁷ These concepts express multiple ways in which societal objectives can be categorized and combined, subject to an ongoing debate on the desired future of humans and the (blue) planet. Presumably, the overall content of these are societal objectives. Contrastingly, IOM and the concepts similar to IOM rather capture the furthering or responding to societal objectives.⁸⁸ I have not listed here some principles of good governance generic to all governance, such as transparency, participation, and accountability,⁸⁹ nor have I listed general principles of public international law, such as the principle of sovereignty.⁹⁰

There is a risk that some versions of these listed concepts are also similar to IOM. Ultimately, choosing IOM and the three concepts similar to IOM is a matter of delimitation. The next section will identify how IOM and the three selected concepts are similar in capturing the kind of integration in focus (a contribution to a broad set of objectives relevant to marine management or governance), and their relevance to management actors at multiple levels.

3.4 Objectives and actor perspectives captured by IOM and concepts similar to IOM

The relationship between a concept, a management actor, and an objective or problem is illustrated in Figure 3.

⁸³ For example, Jan-Gunnar Winther et al, “Integrated Ocean Management for a Sustainable Ocean Economy,” *Nature Ecology & Evolution* 4 (2020).

⁸⁴ For example, as per Ocean Business Action Platform Sustainable, “CEO Roundtables on Ocean - Ocean Stewardship Annual Review,” ed. UN Global Compact (2020).

⁸⁵ For example, Duarte, “Brazil, the Blue Economy and the Maritime Security of the South Atlantic”; European Commission, “The EU Blue Economy Report, 2020.”

⁸⁶ For example, FIAA/C1161 “The FAO Blue Growth Initiative: Strategy for the Development of Fisheries and Aquaculture in Eastern Africa,” (2018).

⁸⁷ Lieberknecht, “Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development,” pp. 8–11.

⁸⁸ Responses are, for example, expressed as “contribute to the restoration,” “strategy,” “prevent or mitigate,” “promote,” “for the sustainable management”. Examples from Paper I, pp. 4–6.

⁸⁹ Unlike, Takei, “Demystifying Ocean Governance,” p. 25.

⁹⁰ See, for example, Ian Brownlie, *Principles of Public International Law*, 7th ed. (Oxford: Oxford University Press, 2008), p. 289.

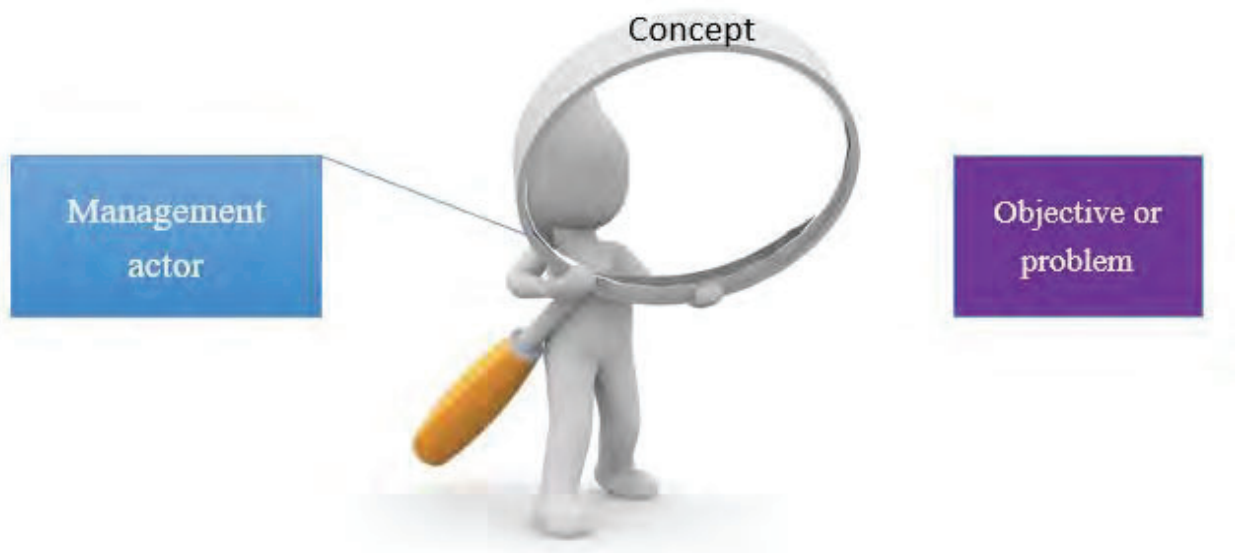


Figure 3: Relationship between management actor, concept (magnifying lens?), and objective or problem.

In ocean governance, multiple management actors can be imagined on the left hand side of Figure 3: states, sub-state ocean management units, and non-state actors, as well as regional and international organizations. Section 4.1.2 explains the different powers and management potential vested in different actors. On the right hand side, multiple objectives and problems can be envisioned, including those of protecting the marine environment and attending to the human need for food and energy. With Figure 3 in mind, the question to be pursued is: if a variety of management actors is included on the left and different and potentially conflicting objectives are included on the right, could these concepts possibly be appropriate lenses for each of these different management actors in response to different and potentially conflicting objectives?

This section now identifies whether IOM and the three concepts similar to IOM aim for a set of social, economic, and environmental objectives and, furthermore, whether they capture the objective of protecting the marine environment (objectives perspectives). Second, it identifies for which management actors these concepts are relevant (management actor perspectives). In light of the diverse uses and the multiple versions of these concepts, each investigation mainly builds on a single or a few variants of each.

As the main point is to identify patterns across these concepts concerning the objectives perspectives and management actor perspectives, the introduction of these concepts is in other ways brief. Moreover, this section does not focus on other aspects of these concepts, such as process management aspects, which are often held as prominent characteristics of them. Section 4.1.4 explains why, and section 6.1.2 reintroduces the process management aspects.

First, the objective and management actor perspectives of one version of *the concept of IOM* will be identified. Paper I has identified one concept that captures the framing of integrated ocean management as a management process for the protection and sustainable use of the marine environment, relying on the ecosystem approach. As Paper I discusses, this concept broadly captures

the threefold set of social, economic and environmental objectives, and clearly captures the objective of protecting the marine environment. The IOM concept is relevant to local, national, and regional management, although Paper I focuses on the state perspective.⁹¹

Second, this section now identifies the objectives and management actor perspectives of *the ecosystem approach to ocean governance*.⁹² The “ecosystem approach has come to feature particularly strongly in the context of marine management.”⁹³ According to the CBD Conference of Parties (COP) Decisions,⁹⁴ the ecosystem approach is “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.”⁹⁵ The ecosystem approach as described and developed by the CBD COP Decisions is adopted for the implementation of “the three objectives of the Convention.”⁹⁶ As per Paper I these three objectives comprise an environmental, economic, and a (limited) social objective, thus comprising the objective of conserving or protecting ecosystems (marine and terrestrial). The management actor perspectives vested in the approach are multiple, as the COP Decisions call upon nation states as well as international organizations to implement the approach locally, nationally, and regionally.⁹⁷

⁹¹ The provisions on relevance for local, national, and regional governance settings are for ICZM in “Protocol on Integrated Coastal Zone Management in the Mediterranean, to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean,” art. 5–7; for IMCM in “Agenda 21 - Global Programme of Action on Sustainable Development,” Chapter 17, sections 17.1 and 17.6; for IMCAM in UNEP/CBD/COP/DEC/VII/5 “Marine and coastal biological diversity,” 2004, pp. 10–11; for ICM in suggestion for upscaling available at <http://pemsea.org/our-work/integrated-coastal-management/ICM-scaling-up>.

⁹² This articulation is chosen, knowing that “[t]here are also a host of related concepts, such as ecosystem-based management (EBM) and the ecosystem approach to management (ESAM), which are sometimes used more or less interchangeably and at other times are ascribed more distinct meanings,” Langlet and Rayfuse, “The Ecosystem Approach in Ocean Planning and Governance: An Introduction,” p. 2. See further, Trine Skovgaard Kirkfeldt, “An Ocean of Concepts: Why Choosing between Ecosystem-Based Management, Ecosystem-Based Approach and Ecosystem Approach Makes a Difference,” *Marine Policy* 106: 103541 (2019).

⁹³ Langlet and Rayfuse, “The Ecosystem Approach in Ocean Planning and Governance: An Introduction,” p. 2.

⁹⁴ Decisions made by COP under the CBD. For an overview of the COP Decisions, see <https://www.cbd.int/ecosystem/decisions.shtml> As held by Langlet and Rayfuse, “the definition and principles provided within the CBD regime remain a central articulation of the conceptual ideas of ecosystem-thinking,” *ibid*, p. 2.

⁹⁵ UNEP/CBD/COP/DEC/VII/11 “Ecosystem Approach,” 2004.

⁹⁶ UNEP/CBD/COP/DEC/II/8 “Preliminary consideration of components of biological diversity particularly under threat and action which could be taken under the Convention,” 1995; UNEP/CBD/COP/DEC/IX/8 “Review of implementation of goals 2 and 3 of the Strategic Plan,” 2008.

⁹⁷ UNEP/CBD/COP/DEC/V/6 “Ecosystem Approach,” 2000; UNEP/CBD/COP/DEC/VII/11 “Ecosystem Approach,” 2004.

Third, the objectives and management perspective captured by the one of the *marine environmental management approaches* will be identified. Marine environmental management approaches comes in many versions, including versions similar to the aforementioned ecosystem approach to ocean governance,⁹⁸ yet one distinguishable from it is the DPSIR (Drivers-Pressures-Status-Impact-Response) approach and derivatives, which I will focus on here. Some consider DPSIR as the “Unifying Framework for Marine Environmental Management.”⁹⁹ DPSIR “provides a framework for categorizing a problem domain, along the cause-effect chain,”¹⁰⁰ acts “as a tool linking applied science and management of human uses (and abuses) of the seas” and is regarded “the most appropriate way to structure environmental information.”¹⁰¹ Focusing on the drivers on, pressures on, status of, and impact on the environment, as well as responses, the DPSIR approach seemingly captures an environmental objective. At least some of its derivative focuses on social welfare and economic activities,¹⁰² thus seemingly capturing the threefold set of environmental, social, and economic objectives. Furthermore, embedded in DPSIR is the objective of environmental protection, as it is stated to be a wide-ranging tool applicable to all types of environmental problems.¹⁰³ The management actor perspectives that DPSIR captures seem broad, as it can be “applied across many systems and geographical [sic], it can link marine systems”¹⁰⁴ DPSIR is used in a number of geographically confined case studies.¹⁰⁵ Further, it was used scaled up to the global level in the WOA1.¹⁰⁶ Thus, DPSIR is relevant to multiple management actors.

Fourth and finally, I will identify the objectives and management actor perspectives of the concept of *marine (or maritime) spatial planning*, focusing on the version used in the EU Maritime Spatial Planning Directive.¹⁰⁷ The Directive sets out that maritime spatial planning, broadly speaking, aims for environmental, economic and social objectives,¹⁰⁸ as the literature on marine spatial planning also

⁹⁸ For other examples, see Long and al, “Key Principles of Marine Ecosystem-Based Management.”

⁹⁹ Joana Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” *Frontiers in Marine Science* 3, no. 177 (2016), in the heading. Another example is Richard Curtin and Raúl Pallezo, “Understanding Marine Ecosystem Based Management: A Literature Review,” *Marine policy* 34, no. 5 (2010), p. 825, referring to DPSIR.

¹⁰⁰ Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 2.

¹⁰¹ European Commission, “Towards Environmental Pressure Indicators for the EU, 1st Ed,” (Luxembourg: Office for Official Publications of the European Communities, 1999).

¹⁰² Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 9.

¹⁰³ *Ibid*, p. 7.

¹⁰⁴ *Ibid*, p. 11. Further, it is stated how “it shows the way in which environmental management is not only embracing complex systems analysis but is very well suited to it because of the many competing aspects.”

¹⁰⁵ *Ibid*, p. 6.

¹⁰⁶ Inniss et al, *The First Global Integrated Marine Assessment - World Ocean Assessment I*, Chapter 2, p. 2.

¹⁰⁷ “Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 Establishing a Framework for Maritime Spatial Planning,” *Oj L* 257, 28.8.2014, P. 135–145.

¹⁰⁸ *Ibid*, art. 5.

confirms.¹⁰⁹ The Directive specifically addresses “the preservation, protection and improvement of the environment”.¹¹⁰ The management actors that this concept is relevant to are EU member states in accordance with the institutional and governance levels determined by them (while consulting relevant authorities nationally, among member states and third states).¹¹¹ Thus, the concept is relevant to multiple different management actors.

3.5 Highly abstract concepts

To summarize, the previous section has shown how versions of IOM, the ecosystem approach to ocean governance, marine environmental management approaches, and marine spatial planning capture a threefold set of environmental, economic and social objectives.¹¹²

Further, all versions of the four concepts are relevant to management actors at multiple levels of governance. On the basis of the objectives and actor perspectives, the abstraction level is high. The question emerges of whether this means “excluding or foreclosing the intrinsic complexity ... and excluding or marginalizing elements ... that do not quite fit.”¹¹³ In light of the high abstraction level, some variables of IOM and the concepts similar to IOM are necessarily excluded or marginalized and others are emphasized. Whether IOM excludes or forecloses protection the marine environment or excludes or marginalizes aspects of it that do not quite fit is subject to further interrogation. The next section introduces the intrinsic complexity of protecting the marine environment.

¹⁰⁹ Similarly, “Marine/maritime spatial planning (MSP) is about managing the distribution of human activities in space and time to achieve ecological, economic and social objectives and outcomes,” Ehler, Zaucha, and Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” p. 1.

¹¹⁰ “Directive 2014/89/EU Establishing a Framework for Maritime Spatial Planning,” art. 5.

¹¹¹ *Ibid*, arts. 4 and 9.

¹¹² The contributing part is evident in, for example, in the phrases of section 3.4: “for protection and sustainable use,” “for the implementation of,” “a framework for,” “a tool for,” and “aimed at.”

¹¹³ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 4.

4 Approach to Protecting the Marine Environment

Section 3 has discussed the first theme of this dissertation, and the time has come to unpack the second theme, which concerns how to approach and concretize protection of the marine environment as a management objective. Nonetheless, these themes overlap in some ways. Investigating ocean *governance* and *management* as well as investigating a *management* objective necessitates, I argue, an understanding and specification of the types of governance and management that the approach captures. Therefore, section 4.1 sets out how I understand the broad topics of governance and management. Moreover, it specifies and explains the management actor in focus—the nation-state (state)—and the type of management—problem-based or goal-based—which this dissertation focuses on. Accordingly, section 4.1 informs both the first theme that regards concepts of ocean management or governance and the second theme that revolves around a management objective.

Following the approach to governance and management, section 4.2 introduces management objectives, before section 4.3 outlines the economic and social objectives and sections 4.4–4.6 unpack and concretize the problem aspects vested in the environmental objective. Section 4.7 discusses whether an arguably important of those problem aspects is concretized in concepts and conventions relevant to ocean management.

4.1 Problem-based management embedded in governance

4.1.1 Governance

This section explains the terms “governance” and “management.” Young describes “governance” at its most general level, as “a social function centered on efforts to steer or guide the actions of human groups – from small local associations to international society – toward the achievement of desired ends and away from outcomes regarded as undesirable.”¹¹⁴ Thus, in the broadest of terms, governance embraces that which concerns governing (or steering or managing) recognizing the complexity of how humans interact in relation to it. Governance captures a range of actors, the entire hierarchy of multiple management levels where top-down and bottom-up management operate, as well as that interaction which does not conform to the hierarchy, such as through networks or by other logic. Governance captures the structures, such as institutions or organizational entities, into which humans organize themselves, as well as state actors, non-state actors, and stakeholders, and the decision-making processes that takes place within or across those structures.¹¹⁵

Klijn and Koppenjan explain the “governance revolution” in a paper from 2020:

¹¹⁴ Oran R Young, *On Environmental Governance: Sustainability, Efficiency, and Equity* (Routledge, 2016), p. 3.

¹¹⁵ Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 352, similarly considers governance a “a multi-level matter.” For a richer description of governance, in which governance of an organization (such as a state) does not qualify for the term but rather is termed “public administration” or “public management,” see H. George Frederickson, “Whatever Happened to Public Administration? Governance, Governance Everywhere,” in *The Oxford Handbook of Public Management* (Oxford: Oxford University Press, 2005).

In the past couple of decades we have seen a shift from governments governing from the center towards more horizontal ways of governing, in which they interact and collaborate with other parties. This shift can be phrased as we do in this article as ‘the governance revolution’. In the academic literature, a wide variety of headings and terms is used to refer to this governance shift, including ‘modern governance’, ‘network governance’, ‘interactive governance’, ‘new (public) governance’.¹¹⁶

The governance revolution, in essence, has expanded the number of actors, more collaborative forms of participation, the complexity of interactions, and the autonomous role of public organizations.¹¹⁷ Leaving aside the question of whether this revolution is a matter of perspective or a real-life revolution, inherent in this governance perspective is richness in, or a high density of, complex information and multiple variables.

Governance could either be perceived as taking an anthropocentric position, as per the previous paragraphs, focusing on humans and human interactions, or, it could be perceived from a socio-ecological or ecocentric position, where humans are embedded in ecosystems, upon which their interaction has an impact. The anthropocentric position must not be confused with an anthropocentric worldview that is “a worldview which perceives human beings as the central and most important element of the Universe”.¹¹⁸ It should be noted that many past and current variants of integrated approaches to ocean management reflect an anthropocentric worldview.¹¹⁹ Whereas the worldview certainly has bearing on which research questions are posed, I argue that which position to take, for the purpose of a research question, should be considered in light of which variables are relevant. For example, if the research question concerns human intervention or how to manage human behavior and activities, an anthropocentric position could be useful. If, however, the research question concerns what to protect, whom to afford possibilities to or to designate as rights holders, any position could be relevant, depending on worldview.¹²⁰

¹¹⁶ Erik Hans Klijn and Joop Koppenjan, “Debate: Strategic Planning after the Governance Revolution,” *Public Money & Management* 40, no. 4 (2020), p. 260 (references omitted).

¹¹⁷ *Ibid.*, p. 260.

¹¹⁸ Peter Burdon, “The Great Jurisprudence,” *Southern Cross University Law Review* 14, no. 14 (2011), p. 2. Margaret Davies, *Asking the Law Question*, 4th ed. (Pymont: Lawbook Co, 2017), p. 464, elaborates on the anthropocentric worldview and the heritage of this thinking and argues how an anthropocentric worldview may not necessarily lead to very different results compared with if the position was ecocentric; Kotzé, “Earth System Law for the Anthropocene,” taking a somewhat different view, arguing that an Earth-centered position, compared with the human-centered and nature-centered view, is “better fit for purpose in the Anthropocene,” p. 10.

¹¹⁹ De Lucia, “The ‘Ecosystem Approach’ in International Environmental Law: A Biopolitical Critique,” pp. 41–46.

¹²⁰ Contrastingly, Kotze and Frech argue for a coherent ecocentric rule of law, Louis J. Kotzé and Duncan French, “The Anthropocentric Ontology of International Environmental Law and the Sustainable Development

Compared with an anthropocentric position, the socio-ecological or ecocentric position involves more (ecological) variables and increases the complexity and density of information. However, some claim that taking a socio-ecological or ecocentric approach to management and governance is necessary to respond to the challenges and “ensure the long-term sustainability and provision of marine goods and services for human wellbeing and prosperity”.¹²¹ In my view, to provide the set of complementary perspectives we need to improve our common understanding, we need research taking different positions, some broad and some focused. Further, an unconditional socio-ecological or ecocentric position risks to be analytically impenetrable or unavailable for some research questions, such as those posed by this dissertation, as the intervention potential or contribution of multiple actors (even within the human species) would vary starkly.

As Paper II argues, the assumption that human pressures-have-impact-where-they-operate has limited relevance. A socio-ecological or ecocentric position risks reinforcing this assumption, if the position imply that marine activities should always be considered with the marine ecosystems of the area where they operate. Such consideration may sometimes be relevant, such as considering the effects fisheries on the ecosystems where they fish. Throughout the life cycle of fisheries (as with any marine or land-based activity), it induces pressures of various scales and nature (waste, physical disturbance or occupation, pollution and CO₂ emissions), of which only some impact on the ecosystems where the activity operates, and others impact elsewhere. Further, the fish-eaters may reside in ecosystems far away from where the fishing takes place. Thus, the effects of fisheries is not always most appropriately considered in combination with the ecosystems where the fishing takes place. In any event, a socio-ecological or ecocentric position should also be carefully considered in light of scale. For these reasons, this dissertation takes an anthropocentric position when investigating intervention potential.

The term management could be used interchangeably with governance, yet I associate management with less density of information (or fewer variables), such as in public administration, individual decision-making at the top or bottom, or management pursued by one actor only.¹²² I therefore prefer

Goals: Towards an Ecocentric Rule of Law in the Anthropocene,” *Global journal of comparative law* 7, no. 1 (2018), p. 31, but may not necessarily intend to embrace an instrumental view of law.

¹²¹ Alexander et al, “Progress in Integrating Natural and Social Science in Marine Ecosystem-Based Management Research,” p. 72. Similarly, as per Curtin and Prellezo, “Understanding Marine Ecosystem Based Management: A Literature Review,” the starting point of EBM is the ecosystem (where “EBM is a form of natural resource management ... emerged from the widespread feeling ... that a new, more holistic way of understanding how ecosystems work is needed”). Similarly, “Modern good governance shifts decision-making toward (...) ecosystem-oriented integrated management,” Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 352. Similarly, “IOM ... demands that all governance be founded upon a highly relational (interdependent), ecocentric and cumulative understanding,” Martin, “A Transnational Law of the Sea,” p. 465.

¹²² Lieberknecht, “Ecosystem-Based Integrated Ocean Management: A Framework for Sustainable Ocean Economy Development,” defines these terms somewhat differently. “Governance refers to the power, responsibilities and mandates of organizations and individuals, whereas management encompasses the

the term management for the research of this dissertation as it focuses narrowly and specifically on one type of management and one kind of actors. Now, this actor will be introduced before the presentation of the type of management that Papers II and III focus on, problem-based management.

4.1.2 A main actor: the nation state

The actors of ocean governance that this dissertation focuses on are states. States are obliged to protect the global marine environment.¹²³ Further, states have formal legal power over territories and marine areas (if a coastal state) and over activities and citizens (Papers I and III).¹²⁴ Beyond these capacities as territorial and citizen sovereign, states have roles as procurer, market state, investor, and as member of the international community. Those (global north) states I have in mind have financial power, and they may have huge public administrations, all of which puts them in powerful positions. In contrast, regional organizations, local communities, and even the UN only control a limited delegated area of authority and a limited budget. Stakeholders and interests groups may have some financial or administrative power, but no formal power over territories, citizens, or activities (beyond what they conduct themselves). The EU does not have similar legal powers to those of the state:

Despite globalization, law is predominantly premised on the nation state as both the prime creator of legal obligations and in particular as implementer and enforcer. Even under the partly supranational structure of EU law, the individual member states are at the center of the law-making process, important interpreters, and almost exclusive enforcers of the law. In many ways, this makes states the Archimedean point or scale of reference in law.¹²⁵

Thus, I argue that the capacities of states to create, to make change or destroy, and to control and influence human behavior put them in a unique powerful position. Further, the direct influence of states over humans and human (economic) activities reflects an often under communicated reality. The dissertation takes the perspective of the state as a uniform and rational actor, although other perspectives certainly exist.¹²⁶

The essentially different power vested in different actors reflects their scope of authority. With some exceptions,¹²⁷ any scope of authority is a product of the delegation of state powers. For example, the scope of authority of a national ocean management regime is a product of the internal distribution of power where the state's authority is divided between sectoral and sub-national units (Paper I).

resources, plans and actions that result from those powers, mandates and responsibilities being actively exercised," p. 31 (reference omitted).

¹²³ UNCLOS, art. 192, imposes upon states a general obligation to protect and preserve the marine environment.

¹²⁴ Ibid, arts. 2, 56, and 77 define the sovereign and jurisdictional rights of the state and art. 193 recognizes the sovereign right of states to exploit their natural resources. Brownlie, *Principles of Public International Law*, p. 289, describes the principles of state jurisdiction over territory and the permanent population.

¹²⁵ David Langlet, "Scale, Space and Delimitation in Marine Legal Governance – Perspectives from the Baltic Sea," *Marine Policy* 98 (2018), p. 280 (references omitted).

¹²⁶ Edward Rubin, "Rational States?" *Virginia Law Review* 83, no. 7 (1997), p. 1433.

¹²⁷ Such as the high seas or the outer space which are not subject to the jurisdiction of any state.

Another example is the limited powers of a regional multi-state organization, which reflects the power that state parties confer to them by treaty. States, typically, do not delegate authority to manage humans, activities, or spaces to regional (multi-national) ocean management initiatives (Paper III). This is even seen in the EU, for example, as per the integrated management of the coastal zones of the Mediterranean, which includes procedural obligations, such as knowledge-sharing and coordination, and some restrictions that each state undertake on themselves.¹²⁸ Yet, an example of states' delegation of power over activities to the EU is the EU Common Fisheries Policy.¹²⁹

The different competence areas of different actors entails that they can contribute in very different ways to an objective or to the alleviation of a problem. Certainly, regardless of having any power everyone can advocate for change or instigate movements that can lead to change by having an impact on empowered actors, Greta Thunberg being the obvious example. Yet, this dissertation focuses on the different potential in formal power legally vested in states as management actors to deal with the problems and objectives of the ocean. This instrumental view on law (section 5.1) also reflects a way in which law can enrich management and governance studies by empowering and designating responsible actors and by concretizing their different potential. Because of the different potential in formal legal power, this dissertation aims for an abstraction level that is relevant to one type of management actor, as opposed to generalizing at a level disregarding the variance vested in this variable.

Based on the sovereign and jurisdictional powers vested in states, collectively they comprise the top level of the (formal legal) global management hierarchy. The 200 or so states are side by side at the top of the hierarchy. I argue that the states collectively are the responsible actors of the global state of affairs, as opposed to it being a “diffused” or international matter. In contrast, Gunningham, in discussing transnational climate governance, maintains that “‘governance’ conceives of state law as simply one node among many in a world of diffused power and responsibility.”¹³⁰ I question this conclusion. Gunningham certainly nuances the leading role of the state by pointing to these non-state actors: institutional investors and other financial market actors, business associations, corporations, cities, municipal networks, and various manifestations of civil society, including international non-governmental organizations (NGOs).¹³¹ Yet, many of these non-state actors are subject to the regulatory powers of their state. The state focus is further nuanced by van Erp et al., explaining, among other things, how

¹²⁸ “Protocol on Integrated Coastal Zone Management in the Mediterranean, to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean” and Paper III.

¹²⁹ “Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy” *OJ L 354*, 28.12.2013, P. 22–61.

¹³⁰ Neil Gunningham, “Smart Mixes, Non-State Governance and Climate Change,” in *Smart Mixes for Transboundary Environmental Harm*, ed. Judith van Erp, et al, Cambridge Studies on Environment, Energy and Natural Resources Governance (Cambridge: Cambridge University Press, 2019), p. 243.

¹³¹ *Ibid*, p. 243.

[t]raditional top-down command-and-control rules prohibiting or restricting environmentally harmful industrial activities have been supplemented by a diverse spectrum of regulatory approaches. Gradually, starting in the mid-1980s a shift took place in the way of thinking about environmental law, both on the international and domestic plane. The ascent of a neoliberal thinking gave birth to the assumption that environmental problems, previously thought to require direct state intervention, could also be solved by (combinations of) deregulation, privatisation, voluntarism, outsourcing, and/or the use of market and suasive mechanisms.¹³²

Further, departing from this and other assumptions and arguments, they explain how

[t]he idea behind smart regulation is that various regulatory and governance instruments, both public and private and both international and local, can be combined into mixes of complementary instruments and actors, tailored to the specific needs of the situation.¹³³

Subscribing to this idea is easy, as a mix of instruments from a range of actors seems more robust than a simplistic state intervention top-down management focus. Still, I challenge this idea to the extent that it undermines the important role of the state. For example, if the outcome of the efforts by the range of actors is not sufficient, there is good reason to have someone to monitor it in the first place, and to be responsible for increasing efforts if need be. Within the logic of sovereignty states, vesting the overall responsibility in 200 states seems beneficial in comparison with no one taking that responsibility. This position of the important role of the state, I argue, complements the position of many scholars of ocean governance and beyond that rather emphasize the range of relevant actors, the range of stakeholders, broad participation, and low-level distribution of power.¹³⁴

Emphasizing the role of the intervening state could appear to be a politically biased position. Certainly, different political positions exist regarding the role of the state and the optimum degree of state intervention, yet I attempt to focus on the management theoretical aspects of this, rather than the political. Whereas a focus on different actors, and different state intervention positions can be more or less politically desired, the question pursued is rather what is theoretically speaking possible for intervention of this actor based on its unique powers and capacities. The interventions available to states through their capacity to regulate humans and human activities, and their territorial and jurisdictional entitlements, can hardly be imagined undertaken by other actors (unless envisioning a fundamental reorganizing of peoples and formal power). Certainly, there are nuances to this view, one main argument being how (economic) activities and (economic) actors, although subject to one state, are embedded in a system of global economy and trade. As Häyhä et al. explains

¹³² Van Erp et al, “Introduction. The Concept of Smart Mixes for Transboundary Environmental Harm,” p. 4.

¹³³ *Ibid*, p. 5.

¹³⁴ For example, Gunningham, “Smart Mixes, Non-State Governance and Climate Change,” p. 243 and Tiina Häyhä et al, “From Planetary Boundaries to National Fair Shares of the Global Safe Operating Space — How Can the Scales Be Bridged?” *Global Environmental Change* 40 (2016), p. 61.

Importantly, decisions regarding environmental management and resource use are generally not made at the planetary scale, but by governments, businesses, and other actors operating at national, sub-national, and supra-national regional levels.¹³⁵

Nonetheless, undermining the unique powerful position of states is not fruitful as it could unintentionally bolster a perception of disempowered states (and state citizens).

4.1.3 Problem-based management

Both the terms governance and management could capture a specific type of management that I call problem-based (or goal-based) management, meaning: societal steering of humans collectively to contribute to an objective or tackle a problem.¹³⁶ This two-part meaning calls for specification with respect to the “societal steering of humans collectively” and “to contribute to an objective or tackle a problem.” The first part reflects the as previously mentioned anthropocentric position to management. Management is assumed to entail steering and modifying human behavior and activities, although it has important effects on the natural environment and although humans are embedded in nature.¹³⁷ Thus, the marine environment plays the passive role of a managed object, yet not an object over which humans have full control but one over which humans have influence.

The societal aspect of the definition entails that the steering is public (unlike, for example, corporate) and, further, that the objective reflects a societal need or problem. Overall societal objectives and problems, such as protecting the environment (and attaining to the social needs of people), relate to the continuous reiterative cycles of ecosystems and humans. Thus, they are objectives that are rarely met once and for all or are problems that are never ultimately solved but require constant attention over time. Because these objectives are not accomplished or achieved, I use the phrase “contribute to” an objective. Nonetheless, whereas these objectives and problems beg for constant attention and

¹³⁵ “From Planetary Boundaries to National Fair Shares of the Global Safe Operating Space — How Can the Scales Be Bridged?” p. 61.

¹³⁶ Similarly, Gunningham, “Smart Mixes, Non-State Governance and Climate Change,” “Within the social science literature, ‘governance’ is variously conceived of as ‘societal steering’ and the ‘management of the course of events within a social system’,” p. 243; Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 351 “Governance involves people making decisions, in keeping with human values, and in order to best meet human goals” (references omitted). A similar term, “strategic management” “encompasses the planning, implementation, evaluation, and updating of a strategic agenda aimed at maintaining the most viable fit between an organization and its external environment and moving into the future in a deliberate, purposeful manner,” see Theodore H. Poister, “Strategic Planning and Management in State Departments of Transportation,” *International Journal of Public Administration* 28, no. 13-14 (2005), pp. 1035–36.

¹³⁷ As suggested by many, including Charles Ehler and Fanny Douvère, “Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-Based Management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme,” in *IOC Manual and Guides No. 53, IACM Dossier No. 6*. (Paris: UNESCO, 2009), p. 18, and Christina Kelly et al, “Investigating Options on How to Address Cumulative Impacts in Marine Spatial Planning,” *Ocean & Coastal Management* 102 (2014), p. 145.

continuous contribution, they must not be confused with taking environmental concerns, which will be explained in sections 4.3–4.4.

The second part of the definition entails that direction and purpose are embedded in problem-based management. It is bringing about a desired future, such as alleviating a problem or contributing to an objective. In contrast, it excludes laissez-faire letting things take their own course, a disbelief in collective human ability to change, or perceiving problems as unmanageable.¹³⁸ Thus, it rests on a (perhaps naive) belief that managing for change is possible, that there are places to intervene even in an ocean governance system.¹³⁹ As per Meadows, within the existing paradigm, the most effective place to intervene in a system is the goals.¹⁴⁰ Whereas I do not suggest new objectives or changing objectives, I suggest a stronger focus on them: emphasizing existing objectives and understanding what each of them require. Framing it as a management objective (unlike a recommendation or direction of an existing norm) provides freedom to analyze the problem, unbound by existing concepts and norms.¹⁴¹ Further, such framing arguably highlights how pursuing protection of the marine environment is a matter of desire or value (rather than obligation) and how it is a (political) choice to prioritize that value. Unlike this approach, Voigt interprets and derives an absolute priority of protecting the ecosystem from the purpose of sustainable development.¹⁴² The focus on objectives entails that this dissertation focuses narrowly on problem-based management—the demands of problems and objectives, and the consistent management implications and mandates.

Other conceptualizations or theorizations exist that are similar to problem-based management. Problem-based management resembles (aspects of) the policy cycle theory, in which, for example, the agenda setting and formulation phases vaguely resemble the three approaches and relevant responses.¹⁴³ Further, aspects of strategic (public) management and strategic planning vaguely resemble problem-based management, yet take a broader view and do not focus particularly on

¹³⁸ Some rather consider certain environmental problems as unmanageable, such as Patricio Bernal et al, “Chapter 54. Overall Assessment of Human Impacts on the Oceans,” in *The First Global Integrated Marine Assessment - World Ocean Assessment I*, by Lorna Inniss, et al. (United Nations General Assembly, 2016), pp. 11–12, which in the last column of the table indicate that there are no successful management strategies to reduce the pressure of ocean acidification and changes in sea temperatures. Strategies do exist for the reduction of these pressures (framed as climate change), as Paper III explains.

¹³⁹ Donella Meadows, “Places to Intervene in a System (in Increasing Order of Effectiveness),” *Whole Earth*, no. 91 (1997), p. 83.

¹⁴⁰ *Ibid*, p. 83.

¹⁴¹ As opposed to, for example, discussing protection of the marine environment in light of the due diligence obligation and international rules and standards, as discussed in Alan Boyle, “Protecting the Marine Environment from Climate Change: The LOSC Part XII Regime,” in *The Law of the Sea and Climate Change: Solutions and Constraints*, eds. Elise Johansen, Ingvild Ulrikke Jakobsen, and Signe Busch (Cambridge: Cambridge University Press, 2020), p. 102.

¹⁴² Voigt, “The Principle of Sustainable Development: Integration and Ecological Integrity.” p. 152. Voigt considers this priority as integration.

¹⁴³ See, for example, Mark Bevir, *Key Concepts in Governance* (London: SAGE Publications Ltd, 2009).

consistency between objectives and implications of objectives and competence area.¹⁴⁴ Furthermore, strategic management also focuses on the (strategic) management process,¹⁴⁵ unlike problem-based management, which excludes process management, as further explained in the next section.

Interestingly, however, Klijn and Koppenjan question the role of strategic planning after the “governance revolution”.¹⁴⁶ One consequence they point to is that

[i]nstead of a rational planner, leaders are needed who know how to connect, motivate and commit actors, to bridge differences and to elicit ideas for innovative solutions and services that are acceptable for a wide range of actors.¹⁴⁷

In my view, whether to focus on the problems and what they “rationally” require or to focus on relations and participation depends on the research question (or the management issue). I argue that both perspectives are necessary. Envisioning planning without problem analysis of fundamental societal objectives and problems or without relational competence and inclusive processes is equally unattractive. Further, I argue that a proper problem analysis that rationally explains how problems are appropriately confronted facilitates acceptance by a wide range of actors.

Problem-based management does not focus on performance management (using performance information to advance an organization).¹⁴⁸ Nor does it focus on process management or management structures, as the next section explains. It only focuses on understanding the problem and consistent implications. Implementation and output is out-of-scope of this dissertation. The basic idea is that if a concept, policy, regulatory instrument, or management regime is not fundamentally designed to intervene in relevant problems and objectives, the management process including implementation and adaptation will not bring it on track.

4.1.4 Management structures and process management

One perspective of management (contrasting with more chaotic perspectives of governance) is that it takes place within a management structure within which (time-bound) management processes take place. The management structure imprecisely captures the system where management is conducted, including institutions and organizational entities. Inherent in any management structure of a certain

¹⁴⁴ Theodore H. Poister, “The Future of Strategic Planning in the Public Sector: Linking Strategic Management and Performance,” *Public Administration Review* 70 (2010); Höglund et al, “Strategic Management in the Public Sector: How Tools Enable and Constrain Strategy Making”; John M. Bryson, Lauren Hamilton, and David M. Van Slyke, “Getting Strategic About Strategic Planning Research,” *Public Management Review* 20, no. 3 (2018), who state that “Public-sector strategic planning ... consists of a set of concepts, procedures, tools, and practices that combine in different ways to create a variety of *approaches* to being strategic,” p. 320.

¹⁴⁵ Bryson et al, “Getting Strategic About Strategic Planning Research,” p. 320.

¹⁴⁶ Klijn and Koppenjan, “Debate: Strategic Planning after the Governance Revolution.”

¹⁴⁷ *Ibid*, p. 261 (reference omitted).

¹⁴⁸ Elio Borgonovi, William C. Rivenbark, and Carmine Bianchi, “Introduction to the Symposium on Exploring the Complexities of Performance Management,” *International Journal of Public Administration* 40, no. 10 (2017), p. 805.

size would be a risk of fragmentation, bad coordination, or a lack of interaction, which can be reduced by increased consultation, coordination, cooperation, or common instruction, which reflects various ways of enhancing integration structurally. An example of how scholars problematize this for ocean governance and management is that “while current management is largely fragmented, with most sectors managed by individual laws, agencies, or regulatory regimes, there are calls for integrated, cross-sectoral management approaches to achieve EBM [ecosystem-based management]”.¹⁴⁹

A simplified synthesis of the management process (Paper I) would include the following phases: knowledge gathering and analysis; policy and decision-making with regard to objectives and priorities, tools and strategies; implementation and monitoring; evaluation and adaptation.¹⁵⁰ In 2012, Quist and Hellström under the heading “Process management: an example of a travelling idea” describe how

[o]ne travelling idea about how organizations should be led and organized, and one that has spread across sectoral as well as national borders in recent decades, is “Process Management” (PM). PM has been described as one of the past two decades’ key management ideas, not only rapidly gaining ground in industry and the private service sector but also significantly involved in the ongoing transformation of public-sector bodies into what are sometimes called “post-bureaucratic” organizations.¹⁵¹

Thus, process management is an idea of our time. Whereas management processes are as old as management, focusing on these processes can certainly be enriching. However, at the outset, these processes and the aforementioned structural risks are no different if the matter is terrestrial, or if the formal authority of management is an organization, public entity or a company (Paper I).¹⁵² Certainly, these inherent structural risks and processes of generic management are also relevant to ocean governance.

¹⁴⁹ Klinger et al, “The Mechanics of Blue Growth: Management of Oceanic Natural Resource Use with Multiple, Interacting Sectors,” p. 356 (references omitted).

¹⁵⁰ For a simplified but essentially similar explanation of the management process for organizations, see Stuart Winby and Christopher G. Worley, “Management Processes for Agility, Speed, and Innovation,” *Organizational Dynamics* 43, no. 3 (2014). For corporate management processes, see, for example, Richard Lynch, *Corporate Strategy*, 2nd ed. (Harlow: Financial Times, 2000), p. 26. For similar but more extensive representations of management processes for marine spatial planning, see Vanessa Stelzenmüller et al, “Monitoring and Evaluation of Spatially Managed Areas: A Generic Framework for Implementation of Ecosystem Based Marine Management and Its Application,” *Marine Policy* 37 (2013). See also the Monitoring and Evaluation of Spatially Managed Marine Areas project, which addresses management processes relevant to marine spatial planning, including an evaluation framework: www.mesmacentralexchange.eu/analyses.html.

¹⁵¹ Johan Quist and Andreas Hellström, “Process Management as a Contagious Idea: A Contribution to Røvik's Virus-Inspired Theory,” *International Journal of Public Administration* 35, no. 13 (2012), p. 902 (references omitted).

¹⁵² *Ibid.*, p. 902.

Sometimes, only some aspects are highlighted. For example, Kelly et al., in an article on marine spatial planning, maintain that

the ecosystem based approach is a useful conceptual framework however, is [sic] considered too theoretical to be directly applied to managing social, economic and environmental objectives, or the ‘integral system’¹⁵³

Yet, if it is too theoretical to be directly applied, by the range of multiple management actors, what does it offer? Kelly et al. further explain that

[n]evertheless, an ecosystem approach which incorporates monitoring and evaluation as well as adaptation as part of its framework can promote understanding, provide data to scientists, inform policy making and help to make effective management decisions¹⁵⁴

Thus, Kelly et al. refer to phases of the aforementioned generic management process to substantiate the concept. Scholarship in ocean governance focusing on management processes is vast.¹⁵⁵ It remains to note that these scholars did not approach, specify, or delimit management or governance as per this section.¹⁵⁶ Nor is the cut between management processes and “substantive” management entirely clear. Although the first concept of IOM of Paper I finds management processes as a common denominator, the remaining parts of the dissertation does not focus on process management nor management structure. Rather, they look beyond a (perfect) ocean management process, to focus on the potential of ocean management to contribute to protection of the marine environment (was it

¹⁵³ Kelly et al, “Investigating Options on How to Address Cumulative Impacts in Marine Spatial Planning,” p. 144, references omitted.

¹⁵⁴ Ibid, p. 144, references omitted.

¹⁵⁵ Ehler, Zaucha, and Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” p. 1; Gilek, Saunders, and Stalmokaitė, “The Ecosystem Approach and Sustainable Development in Baltic Sea Marine Spatial Planning: The Social Pillar, a ‘Slow Train Coming’,” p. 162; Winther et al, “Integrated Ocean Management for a Sustainable Ocean Economy”; Riku Varjopuro, “Evaluation of Marine Spatial Planning: Valuing the Process, Knowing the Impacts,” in *Maritime Spatial Planning: Past, Present, Future*, ed. Jacek Zaucha and Kira Gee (Cham: Palgrave Macmillan, 2019); Gunnar Sander, “Against All Odds? Implementing a Policy for Ecosystem-Based Management of the Barents Sea,” *Ocean & Coastal Management* 157 (2018); Fred P. Saunders, Michael Gilek, and Ralph Tafon, “Adding People to the Sea: Conceptualizing Social Sustainability in Maritime Spatial Planning,” in *Maritime Spatial Planning: Past, Present, Future*, ed. Jacek Zaucha and Kira Gee (Cham, UK: Palgrave Macmillan, 2019), pp. 190–93; Kelly et al, “Investigating Options on How to Address Cumulative Impacts in Marine Spatial Planning.” Confirming that studies focusing on “realities” of ocean management are rare, see Peter J. S. Jones, L. M. Lieberknecht, and W. Qiu, “Marine Spatial Planning in Reality: Introduction to Case Studies and Discussion of Findings,” *Marine Policy* 71 (2016), p. 263.

¹⁵⁶ For example, a different than realistic ontological position could provide one explanation of a focus on the production and consumption process of documents, unlike their content, style, or structure. Justesen and Mik-Meyer, *Qualitative Research Methods in Organisation Studies*, pp. 121–22.

perfectly implemented). The consequences of the “substantive” problem-based approach for the process-based approaches will be dealt with in section 6.1.2.

4.2 A note on management objectives

The overall research question that inquires about the contribution only to the environmental objective entails separating it from economic and social objectives, unlike an all-encompassing approach. This illustrates the paradox of investigating broad and all-encompassing concepts such as IOM in that the research requires delimitations which results in the investigation of only aspects of them. However, the same applies to management efforts—they require delimitations too—and the question emerges which problem aspects should be highlighted if protecting the marine environment is the management objective.

It has been increasingly recognized, for example by states, how “humans ... are an integral component of many ecosystems”.¹⁵⁷ As section 4.1.3 has already mentioned, protecting the marine environment means protecting the continuous reiterative complex life cycles of marine ecosystems and their components, which are interconnected with larger socio-economic systems (Paper III). Presumably, protecting ecosystems is correspondingly difficult, demanding a complexity of management regimes and efforts.

The approach of this dissertation attempts to embrace the tension of, on the one side, the complex reality, and on the other side, the need for concretizing main aspects for management purposes. Any management actor has limited resources, thus main aspects must be specified in order to ensure that these are prioritized. The approach recognizes the complexity, yet approaches it one aspect at a time. Each aspect, neither individually nor in combination, captures the entirety. Pluralistic perspectives beyond those offered by this dissertation is needed, some broad, some focused. Nonetheless, the approach suggests some problem aspects of relevance to protection of the marine environment. Yet, first, those objectives that are out of the scope of the approach will briefly be outlined.

4.3 Brief sketch of economic and social objectives

A brief sketch of the economic and social objectives of ocean management will be provided for the purpose of drawing some borders and emphasizing some overlaps between these different objectives. While they are interconnected and embedded in complex socio-ecological systems, as per the previous section, the purpose here is to emphasize what separates them.

The economic objective of ocean management entails the facilitation of existing and expanding marine activities (Paper III). Facilitating existing and expanding activities “requires economic actors’ physical access to marine areas and resources (such as for operation and infrastructure, and for a depository for waste products)” (Paper III). Further, facilitation of activities also demands inter-actor and inter-sectoral distribution of space and resources between activities. Furthermore, facilitation includes providing financial access (to make investments in infrastructure, production facilities, and equipment) (Paper III). Facilitation of physical access to marine areas and resources, in particular for

¹⁵⁷ For example, as evident in UNEP/CBD/COP/DEC/V/6 “Ecosystem Approach,” 2000.

expanding activities, would result in physical occupation of habitats, emissions and waste, which are negative consequences for the marine environment. The question emerges whether a reduction of some of these negative consequences, for example, following an environmental impact assessment and an application of the integration principle (section 3.3), should be categorized as a modifier to a (primary) economic objective (section 6.2.1) or as a (secondary) environmental objective (Paper II).

The social objectives of ocean management are understood as meeting social (human) needs of coastal communities (Paper III). These social needs include the rough sub-objectives as outlined by Raworth¹⁵⁸ including food and water, energy and housing, access to health, education, income and work, peace and justice, political voice, gender equality, and networks. These sub-objectives roughly resemble “basic human rights of people,”¹⁵⁹ yet differ from approaches discussing these by the use of concepts (Paper III).¹⁶⁰ To the extent that the economic objective provides income, work, and monetary resources for people, to spend on, for example, housing, energy, education and health services, the economic objective partly overlaps with the social objective. This is one of the reasons why these are sometimes grouped as socio-economic objectives.

Other social needs diverge more from the economic objective, such as the political voice. It includes the need for information, transparency, and participation in the management of local and national affairs. Although providing for these needs could indirectly lead to an enhanced focus on environmental objectives, it could also lead to an enhanced focus on, for example, socio-economic objectives. For example, a recent conference providing input to the scientific basis of the Norwegian IMM plans, involved eight presenting stakeholders, of which five were environmental organizations, and three were industry or employee organizations.¹⁶¹ Eight written stakeholder submissions were submitted following the conference, of which three were from environmental organizations and five from industrial or employee organizations.¹⁶² The example shows how information, transparency, and participation may not necessarily lead to an increased focus on environmental objectives. In any event, for the purpose of this dissertation, information, transparency, and participation are regarded

¹⁵⁸ Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist* (London: Random House Business, 2018), p. 10.

¹⁵⁹ Henriette Grimm et al, “Integration of the Social Dimension into Marine Spatial Planning – Theoretical Aspects and Recommendations,” *Ocean & Coastal Management* 173 (2019), p. 142.

¹⁶⁰ Such as, “[g]iven the complexity of the marine spatial planning process and the variability across its application worldwide any understanding of ‘social dimension’ involves several different social concepts,” *ibid*, p. 140, and “[t]he social dimension in marine spatial planning includes but is not limited to concepts of social sustainability, social responsibility, social license, cultural valuation, social justice, equity and ethics,” *ibid*, p. 142; Saunders, Gilek, and Tafon, “Adding People to the Sea: Conceptualizing Social Sustainability in Maritime Spatial Planning,” pp. 190–93.

¹⁶¹ Website including the program and the submissions, <https://havforum.miljodirektoratet.no/medvirkning/seminar/innspillsmote-for-interesseorganisasjoner-14.desember-2020/>.

¹⁶² *Ibid*.

primarily as social objectives as they primarily reflect human needs. Accordingly, they are out of scope.

4.4 Problem-framing how to protect the marine environment

This section now returns to unpack the environmental objective of protecting the marine environment. Beyond separating it from economic and social objectives, the approach further entails separating objectives from responding to them, in contrast to, for example, conceptualizing problems and responses in one approach. The dual approach allows us, on the one hand, to embed some problem aspects within the complex objective, and, on the other hand, to take the position of certain management actors and investigate some implications relevant to them, such as relevant responses. Further, separating problems from responses allows for taking an socio-ecological position to understanding the problem (ecosystems under pressure by humans embedded in them) and an anthropocentric position to responding to the problem (by interventions that modify human behavior or activities).

The first part of the problem analysis focuses on the nature and scale of the problems of the marine environment, which are addressed, for example, in three scientific assessments and reports. The first, WOA1, is the outcome of the first cycle of a regular process reporting global assessment of the state of the marine environment performed under the auspices of the UN.¹⁶³ Under the heading the “[u]rgency of addressing threats to the ocean,” the WOA1 states how

[t]he greatest threat to the ocean comes from a failure to deal quickly with the manifold problems ... Many parts of the ocean have been seriously degraded. If the problems are not addressed, there is a major risk that they will combine to produce a destructive cycle of degradation in which the ocean can no longer provide many of the benefits that humans currently enjoy from it.¹⁶⁴

The second, the IPBES report, was issued on request by the COP of the CBD.¹⁶⁵ Concerning marine ecosystems, the report states that

[m]arine ecosystems, from coastal to deep sea, now show the influence of human actions, with coastal marine ecosystems showing both large historical losses of extent and condition as well as rapid ongoing declines (established but incomplete).¹⁶⁶

The third report is the IPCC special report. It states that

¹⁶³ Inniss et al, *The First Global Integrated Marine Assessment - World Ocean Assessment I*. The UNGA welcomed the assessment and approved its summary in UNGA/RES/70/235 “Oceans and the Law of the Sea,” (2015), in para. 266. World Ocean Assessment II is expected to be launched in spring 2021.

¹⁶⁴ Inniss et al, *The First Global Integrated Marine Assessment - World Ocean Assessment I*, p. 41.

¹⁶⁵ Díaz et al, “IPBES Summary for Policy Makers.”

¹⁶⁶ *Ibid*, p. 24.

[t]his assessment of the ocean and cryosphere in a changing climate reveals the benefits of ambitious mitigation and effective adaptation for sustainable development and, conversely, the escalating costs and risks of delayed action. ... This highlights the urgency of prioritising timely, ambitious, coordinated and enduring action (*very high confidence*).¹⁶⁷

These scientific assessments and reports indicate the seriousness of the degradation and decline of the ocean environment, resulting from the manifold problems and the influence of human actions, and the urgency of prioritizing and addressing these threats.

The question is now at which scale to approach human interference with the marine environment. As late as the 1970s, “[s]tates still assumed that impacts [from marine pollution] would be local and controllable by the State from which the pollutants emanated.”¹⁶⁸ Detrimental to this view, Paper II identifies the macroecological perspective as per Burger et al.¹⁶⁹ It is a global perspective of the entirety of the Earth’s environment and the human interference therewith, showing how human economies “extract energy and material resources from the environment and transform them into goods and services”.¹⁷⁰ “The production of energy, the exploitation of resources, the transformation into goods and services, and the consumption thereof occur at a global scale, as resources, production facilities and end consumers often reside on each continent” (Paper II). Throughout this process, waste products are created.¹⁷¹ Further, the capacity of the biosphere to absorb or detoxify the substances resulting from these global processes is also global in scale.¹⁷² Thus, Burger et al. question

Can the Earth support even current levels of human resource use and waste production? ... The emphasis on local and regional scales ... is largely irrelevant if the human demand for essential energy and materials exceeds the capacity of the biosphere to absorb or detoxify these substances.¹⁷³

Thus, the macroecological perspective questions the relevance of any but global scale. The environmental effects of the global processes of extracting energy and materials and relieving emissions and waste are largely known (we see the smoke leaving the chimneys). Impacts may, however, be spread out globally and may only be detected on an aggregated level (such as with the concentration of CO₂ in the atmosphere) if at all (it is absorbed somewhere). Thus, tracing all the

¹⁶⁷ Pörtner et al, “IPCC Summary for Policymakers,” p. 35.

¹⁶⁸ Elizabeth A Kirk, “Science and the International Regulation of Marine Pollution,” in *Oxford Handbook of the Law of the Sea*, ed. Donald R. Rothwell, et al. (Oxford: Oxford University Press, 2015), p. 519 (reference omitted). The assumption is also evident in Principle 13 of the Stockholm Declaration, cited p. 2, where “States should adopt an integrated ... approach ... to ensure the need to protect and improve the environment for the benefit of their population.” (author’s emphasis), UNGA/CONF.48/14/Rev.1 “Report of the United Nations Conference on the Human Environment (Stockholm Declaration).”

¹⁶⁹ Joseph R. Burger et al, “The Macroecology of Sustainability,” *PLoS Biology* 10, no. 6 e1001345 (2012).

¹⁷⁰ *Ibid*, p. 2.

¹⁷¹ *Ibid*.

¹⁷² *Ibid*, p. 4.

¹⁷³ *Ibid*.

concrete processes that have had an impact on the ecology of a confined area is impossible (Paper II). In light of this perspective, the local ecological scale has limited relevance. A geographically confined marine area is, nonetheless, to a more or less extent, impacted by different pressures depending on where it is located. In some areas, the local and regional pressures are the major problem, such as the “dead zone” (hypoxic zone) in the Gulf of Mexico caused primarily by runoff from the Mississippi River Basin.¹⁷⁴ This problem analysis does not focus on such zones where the concentration of local or regional pressures are particularly high. Nonetheless, provided they recover from the local or regional pressures induced, even these areas depend on the global ocean environment. Paper III further argues that the existence of global pressures, global capacity constraints, ocean currents, and the fluid nature of the sea substantiate that a confined marine area depends on the marine environment at larger scales, independent of where it is situated.¹⁷⁵

Having identified some premises of nature and scale of the problems of the marine environment, the next step is how to approach and intervene in the global processes from materials and energy to waste and emissions. This step that investigates the intervention potential is approached through the perspective of the state. As per section 4.1.2 and Paper II, the national scale is useful from an intervention perspective, as states have multiple jurisdictional capacities with which they could intervene in the global processes and global pressures.

Nonetheless, despite the capacities of states, the potential contribution of any nationally scaled environmental efforts can arguably be questioned. Papers II and III outline how national efforts respond to the global processes, from resources and energy to waste and emissions, as each state contributes to a proportion of the global pressures through national resource extraction and energy production, as well as through demand, import, production, export, and consumption of goods and services by national citizens and national public and private entities. While reducing this proportion equals the national potential for contribution, Paper II investigates the contribution of ocean management in the face of this potential.

Paper II and III both suggest identification of, and responding to, the main pressures on the global marine environment as one way of intervening with the global processes. Paper II also suggests two more approaches relevant to state-level ocean management. Next, section 4.5 explains these three approaches, before the former is developed in more detail, in section 4.6, including the extent to which it is evident in existing concepts and conventions, in section 4.7.

¹⁷⁴ Craig and Hughes, “Marine Protected Areas, Marine Spatial Planning, and the Resilience of Marine Ecosystems,” p. 105.

¹⁷⁵ Further, Winther et al. in a study of integrated ocean management highlight “the need to consider the totality of pressures on the entire ocean space,” Winther et al, “Integrated Ocean Management for a Sustainable Ocean Economy,” p. 1452.

4.5 Three approaches

Based on the problem analysis, Paper II suggests a threefold set of approaches reflecting three different problem aspects (or sub-objectives) relevant to state-level ocean management. These approaches are:

- (1) The mitigation approach that targets the reduction of human pressures on the marine environment regardless of where the impacts occur.
- (2) The impact approach that targets the combined impact of pressures on a smaller area such as a spatially defined marine area of a state.
- (3) The activities approach that targets the reduction of certain environmental harm caused by a confined set of activities operating within a marine area of a state.¹⁷⁶ (Paper II)

An assumption and one of the main points of Paper II is that whereas all three approaches contribute to improvement of the marine environment, their potential contributions or achievements differ. The mitigation approach targets the main threats to the environment, including overfishing, climate change, marine pollution, increased demand for space, and non-native species (section 4.6). Thus, when applied by a majority of states it may lead to long-term protection of the marine environment. The other two approaches contribute differently. As per Paper II, even if a majority of states apply the impact and activities approaches systematically, it would not lead to protection of the marine environment. These two only capture a selection of pressures that does not reflect the fundamental, the main, or the necessary pressures but those relevant to a different and more limited purpose (Paper II). Therefore, the impact and activities approaches are not designed to abate the fundamental threats to the environment (regardless of the harm reduction or environmental improvement), thus they will not lead to protection of the marine environment (Paper II).¹⁷⁷

The mitigation approach is relevant beyond Paper II, as it arguably targets an important problem aspect of (marine) environmental protection, relevant to any management actor. In contrast, the impact and activities approaches are tailored to the state-level marine management context of Paper II. Thus, the three approaches do not intend to have universal relevance to marine environmental management. They are tailored to the specific research question and management context of Paper II, unlike the mitigation approach which in comparison has broader relevance.

4.6 More on the mitigation approach

The mitigation approach reappears in Paper III, formulated as reducing environmental pressures. Reduction or mitigation is used interchangeably to broadly capture the reduction, hindering or

¹⁷⁶ These three approaches may resemble the DPSIR approach and derivatives, Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” Yet unlike DPSIR the three approaches emphasize the diverging implications of pressures and impact for management. Paper II elaborates this.

¹⁷⁷ A. D. Judd, T. Backhaus, and F. Goodsir, “An Effective Set of Principles for Practical Implementation of Marine Cumulative Effects Assessment,” *Environmental Science & Policy* 54 (2015), steps 1 and 2 on p. 260 vaguely resemble the impact and activities approaches yet investigate a different question.

prevention of the main environmental pressures. Recognizing the complexities of protecting the marine environment, Paper III argues that for protection of the marine environment, an important approach is to reduce the main environmental pressures (until healthy levels are restored):

reducing environmental pressures implies responding to environmental problems, unlike adapting to their consequences or assessing their impact. Whereas scholars generally subscribe to how ocean management is relevant to the protection of the marine environment, some scholars even specify, for example, that marine spatial planning is relevant to the mitigating of climate change as well as to “reducing non-climate stressors and pressures (for example, pollution, over-fishing and habitat loss”¹⁷⁸ (Paper III).

The WOA1 and the IPBES report include two scientific assessments of the main pressures or direct drivers on the global marine environment.¹⁷⁹ These reports identify, synthesize and categorize the main negative human pressures on or direct drivers in the marine environment in a manner that arguably is valuable for evaluation and structuring of intervention for protection of the marine environment.¹⁸⁰ The SDGs represent another categorization used for structuring management efforts.¹⁸¹ However, unlike WOA1, the SDGs capture a broad set of objectives that include economic and social objectives. Another categorization applicable to protection of the global (marine and terrestrial) environment is the planetary boundaries,¹⁸² which provide important points of reference regarding the status of the environment. The Ocean Health Index provides yet another categorization resulting in a numerical index, which is based on the identified status, trend, pressure (meaning

¹⁷⁸ Catarina Santos et al, “Integrating Climate Change in Ocean Planning,” *Nature Sustainability* 3 (2020), p. 4.

¹⁷⁹ Bernal et al, “Chapter 54. Overall Assessment of Human Impacts on the Oceans”; Díaz et al, “IPBES Summary for Policy Makers,” p. 9. Beyond providing such assessments, both the WOA1 and IPBES report include discussion and assessments related to a broader set of objectives. WOA1 uses “impacts” and “pressures” somewhat interchangeably in this Chapter, but introduces the taxonomy as a “taxonomy of the main sources of human pressures on the marine environment,” p. 1. The classification of direct drivers of the IPBES report is based on aggregated impacts, see p. 105. As will be explained in section 4.6, impacts align with pressures at the global scale.

¹⁸⁰ Bernal et al, “Chapter 54. Overall Assessment of Human Impacts on the Oceans”; Díaz et al, “IPBES Summary for Policy Makers,” p. 9, see also Chapter 2.1 pp. 105–21 of the full assessment report, E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (eds), *IPBES Global assessment report on biodiversity and ecosystem services*. Bonn, Germany: IPBES secretariat, 2019, available at https://www.ipbes.net/sites/default/files/ipbes_global_assessment_chapter_2_1_drivers_unedited_31may.pdf

¹⁸¹ UNGA/RES/70/1 “Transforming Our World: The 2030 Agenda for Sustainable Development”.

¹⁸² Johan Rockström, “Planetary Boundaries,” *New Perspectives Quarterly* 27, no. 1 (2010); Will Steffen et al, “Sustainability. Planetary Boundaries: Guiding Human Development on a Changing Planet,” *Science* 347, no. 6223: 1259855 (2015). Frank Biermann, “Planetary Boundaries and Earth System Governance: Exploring the Links,” *Ecological Economics* 81 (2012). p. 4, discusses amongst other issues how planetary boundaries (unlike a focus on human causes, pressures or drivers) “relate to governance,” thereby capturing multiple management aspects other than that of this article.

ecological and social factors that decrease status), and resilience of ocean health.¹⁸³ Amid these broader perspectives, the main pressures of WOA1 and the direct drivers of the IPBES report have the benefit of highlighting the environmental pressures on the marine environment at a given (global) scale.

The main pressures or direct drivers of WOA1 and the IPBES report will now be introduced, simplified to key words. WOA1 identifies seven main pressures: (1) climate change (including ocean acidification); (2) fishing and harvesting; (3) marine pollution; (4) increased demand for marine space; (5) underwater noise; (6) interfering structures; and (7) non-native species (as spread by shipping, aquaculture, and marine debris).¹⁸⁴ This taxonomy of the main pressures is roughly similar to what the IPBES report names the five direct drivers in the global marine environment: (1) fisheries and other harvesting of marine organisms; (2) change in area use on land and at sea, including development of infrastructure and aquaculture in the coastal zone; (3) climate change; (4) pollution and waste; and (5) invasive and alien species.¹⁸⁵ WOA1 does not rank the main pressures. The IPBES report considers the first direct driver (fisheries and other harvesting of marine organisms) as the one that has greatest impact on the marine environment, and change of area use is considered second.¹⁸⁶ As Paper III explains, the second direct driver (change of area use) of the IPBES report includes the sixth pressure of WOA1 (interfering structures), and the fourth IPBES direct driver (pollution) includes the fifth pressure of WOA1 (noise). Thus, these two sets of main pressures or direct drivers are roughly similar. Thus, I will refer to them in combination as main pressures as follows.

These sets of main pressures are rough categories, which are certainly subject to debate. Nonetheless, these scientific assessments are contributed to by hundreds of scientists, from many countries, representing various disciplines, building on regional, sub regional, and national, and thematic assessments.¹⁸⁷ Moreover, these pressures do not appear to be scientifically contested (at least not beyond the extent to which climate change is contested as a scientific fact).¹⁸⁸ Therefore, I argue that the main environmental pressures are neither contested nor “contentious.”¹⁸⁹ Necessarily, the

¹⁸³ On the Ocean Health Index (OHI), for overviews and scores see www.oceanhealthindex.org, for related scholarly studies see, for example, Benjamin Halpern et al, “A Global Map of Human Impact on Marine Ecosystems,” *Science* 319, no. 5865 (2008); Benjamin Halpern et al, “Patterns and Emerging Trends in Global Ocean Health,” *PLoS One* 10, no. 3: e0117863 (2015).

¹⁸⁴ Bernal et al, “Chapter 54. Overall Assessment of Human Impacts on the Oceans.”

¹⁸⁵ Díaz et al, “IPBES Summary for Policy Makers,” p. 9. See also Brondizio et al., *IPBES Global assessment report on biodiversity and ecosystem services*, pp. 105–21.

¹⁸⁶ Díaz et al, “IPBES Summary for Policy Makers,” p. 12.

¹⁸⁷ Inniss et al, *The First Global Integrated Marine Assessment - World Ocean Assessment I*, pp. 17 and 29. Similarly, about IPBES, see <https://ipbes.net/global-assessment>.

¹⁸⁸ Bernal et al, “Chapter 54. Overall Assessment of Human Impacts on the Oceans,” p. 2, discusses how structuring any taxonomy is subject to debate, yet does not problematize the main pressures as debated. Brondizio et al., *IPBES Global assessment report on biodiversity and ecosystem services*, Chapter 2.1, pp. 13–17, consider most findings as “well established” and some as “established but incomplete.”

¹⁸⁹ Elizabeth Fisher, “Executive Environmental Law,” *The Modern Law Review* 83, no. 1 (2020), p. 166.

pressures could change over time; thus, future research focusing on pressures must consult updated assessments and new knowledge. For example, a second assessment of the global marine environment (WOA2) is expected in spring 2021. In any event, it should be highlighted that the main pressures are generally known, but the required responses call for uncomfortable priorities that many would consider controversial or undesirable.

Paper III outlines the responses available to states in relation to each of these pressures. Two examples from this paper follow. The first is a sketch of relevant responses to marine pollution.

Management approaches to the reduction of pollutants entering the marine environment could target the design, production, import, export, and consumption of goods and services, and systems for reuse and proper waste management. Additionally, under the perspective that any sector should reduce waste and pollution to the extent possible, a sectoral approach guided by sectoral expertise could be complementary and appropriate. (Paper III)

The second is an example of responses available to states to reduce the pressure induced by fisheries and harvesting:

The range of measures to mitigate this pressure includes direct regulation of fisheries, import and export regulation, but also market mechanisms (such as influencing demand through labelling, informational or educational means) including by international cooperation (Paper III).

Based on these sketches, Paper III discusses the appropriateness of reducing these pressures within the framework of ocean management.

The mitigation approach resembles approaches to climate change, where scholarship often differentiate between climate change mitigation and climate change adaptation.¹⁹⁰ Thus, where a single environmental problem is in focus, differentiating between the problem, responding to it, and adapting to its consequences is commonplace (unlike conceptualizing two or three in one approach). The approach of this dissertation entails that climate change is one among many environmental pressures. Section 6.2.3 will address whether climate change should be dealt with as a “superior problem,” if protecting the marine environment is the premise. Adaptation is generally out of the scope of this dissertation, as it is primarily understood as a social objective (humans adapting to changing circumstances).

A final note is provided on the difference between targeting pressures and targeting impact. If impact is targeted at a global scale, responses to reduce impacts align with responses to reduce pressures. At a smaller scale, they would not. As mentioned, states assumed that impacts (of pollution) would be

¹⁹⁰ For example, Robin Kundis Craig, “Mitigation and Adaptation,” in *The Law of the Sea and Climate Change: Solutions and Constraints*, eds. Elise Johansen, Ingvild Ulrikke Jakobsen, and Signe Busch (Cambridge: Cambridge University Press, 2020).

local and controllable as late as the 1970s.¹⁹¹ Yet, more recent knowledge as set out in sections 4.4–4.6 shows how pressures are in many ways global. Global pressures play out differently in different areas, depending on the characteristics of ecosystems and concentrations of pressures.¹⁹² Even though the global pressures on the marine environment need to be reduced generally, the impact capacity of a specific area may vary, entailing that effects do not spread out evenly, some areas tolerate pressures more than others, whereas others suffer strongly under existing pressures (Paper II). Thus, the impact on a confined area may point to different pressures than the main global pressures.

4.7 The mitigation approach in concepts and conventions

The previous sections have argued for the relevance and importance of the mitigation approach, which is arguably an important aspect of the objective of protecting the marine environment. The extent to which the mitigation approach, alongside the impact and activities approaches, are embedded in an instrument of IOM is explored in Paper II. The extent to which the mitigation approach is compatible with an illustrative ocean management mandate is discussed in Paper III. This section briefly identifies if the mitigation approach is explicitly included (unlike being implicitly included by the objective of protecting the marine environment) by IOM and the concepts similar to IOM, or by international legal and policy instruments relevant to protection of the marine environment.

The questions is whether the mitigation approach, phrased as, for example, “identifying and addressing environmental pressures” or similar phrase, is explicitly captured by the two integrated concepts of ocean management in Paper I.¹⁹³ For convenience, these concepts are the framing of integrated ocean management as a management process for the protection and sustainable use of the marine environment, relying on the ecosystem approach; and the incorporation of environmental, economic, and social concerns into an (ocean management) policy (section 3.3 and 3.4). The first concept is based on commonalities of different instruments of integrated ocean management. An explicit reference to the mitigation approach is not a commonality across these instruments, but these instruments all touch on the topic with varying specificity and emphasis.¹⁹⁴ The second concept of

¹⁹¹ Kirk, “Science and the International Regulation of Marine Pollution,” p. 519 (references omitted).

¹⁹² Benjamin Halpern et al, “Evaluating and Ranking the Vulnerability of Global Marine Ecosystems to Anthropogenic Threats,” *Conservation Biology* 21, no. 5 (2007), p. 1302. Kelly et al, “Investigating Options on How to Address Cumulative Impacts in Marine Spatial Planning,” explains the difficulty that “several human activities can have the same or similar effects on the marine environment and its ecosystems. Attempting to attribute or distinguish each effect to a single use in multi-use areas has not been achieved convincingly to date. Similarly, distinguishing the effects of human activities from natural disturbance is also proving difficult,” p. 144 (references omitted).

¹⁹³ The (global) scale is not in focus in this section.

¹⁹⁴ PEMSEA, “The Integrated Coastal Management (ICM) Code and Framework” do in the guiding notes mention, as an example of a strategy, to “[m]itigate environmental risks that occur as a consequence of human activities,” see p. 4. “Protocol on Integrated Coastal Zone Management in the Mediterranean, to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean,” (ICZM) includes more vague phrases, such as in art. 6 (b) “to prevent the negative effects of (...) development”

Paper I does not specify how to include environmental concerns, thus it does not explicitly include such phrase.

Some variants of the ecosystem approach include a phrase similar to “identifying and addressing environmental pressures.” A definition by the Helsinki and OSPAR Commissions includes the phrase “in order to identify and take action on influences which are critical to the health of marine ecosystems”.¹⁹⁵ Other versions of the ecosystem approach are silent on this aspect, including the prominent CBD definitions.¹⁹⁶ The DPSIR (Drivers-Pressures-Status-Impact-Response) approach captures pressures and responses, yet by including other elements it does not emphasize the link between these two.¹⁹⁷ As per the preamble of the EU Maritime Spatial Planning Directive, collective pressures of human activities shall be kept within certain levels.¹⁹⁸ This statement could imply that these pressures should be identified and addressed if incompatible with the threshold. Yet, the

and art. 6 (j) to prevent and restore damage on the coastal environment. “Agenda 21 - Global Programme of Action on Sustainable Development.” (IMCM), Chapter 17, sections 17.28 and 17.30, identifies two pressures (pollution and physical destruction) by land-based activities where action should be considered. Further, it recommends to assess the need for additional measures to address degradation from sea-based activities of the marine environment, thus not capturing the mitigation approach in full. However, IMCAM, as per UNEP/CBD/COP/DEC/VII/5 “Marine and coastal biological diversity,” 2004, involves to “undertake direct action to protect the marine environment from negative impacts” from land-based and sea-based activities as one of two operational objectives, which is similar to the mitigation approach, yet does not involve the identification of main pressures/drivers.

¹⁹⁵ As expressed in a common statement by the Helsinki and OSPAR Commissions, created respectively under the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 2099 *U.N.T.S.* 195, and the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, 2354 *U.N.T.S.* 67. “First Joint Ministerial Meeting of The Helsinki and OSPAR Commissions (JMM)” Bremen: June 25–26, 2003, see <https://helcom.fi/wp-content/uploads/2019/10/First-Joint-Ministerial-Meeting-of-the-Helsinki-and-OSPAR-Commissions.pdf>. The International Council for Exploration of the Seas (ICES) has an expert group targeting human activities, pressures, and impact, however mostly (but not solely) with regard to their effect on marine ecosystems, see <http://www.ices.dk/community/groups/Pages/HAPISG.aspx>. Kirkfeldt, “An Ocean of Concepts: Why Choosing between Ecosystem-Based Management, Ecosystem-Based Approach and Ecosystem Approach Makes a Difference” provides an overview of which ecosystem approaches include a similarly aspect that Kirkfeldt names “impact management”.

¹⁹⁶ UNEP/CBD/COP/DEC/V/6 “Ecosystem Approach,” 2000; UNEP/CBD/COP/DEC/VII/11 “Ecosystem Approach,” 2004.

¹⁹⁷ See, for example, Sirak Robele Gari, Alice Newton, and John D. Icely, “A Review of the Application and Evolution of the DPSIR Framework with an Emphasis on Coastal Social-Ecological Systems,” *Ocean & Coastal Management* 103 (2015); Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?”

¹⁹⁸ “Directive 2014/89/EU Establishing a Framework for Maritime Spatial Planning,” paragraph 14 of the preamble. See also, “Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 Establishing a Framework for Community Action in the Field of Marine Environmental Policy (Marine Strategy Framework Directive),” *OJL 164, 25.6.2008, P. 19–40*, art. 1(3).

Directive includes no provisions on the threshold or its operationalization. Thus, the mitigation approach is not clarified or emphasized by this version of the concept of marine spatial planning.

The question remains whether identifying and addressing the main pressures are captured by some international legal and policy documents and instruments relevant to protection of the global marine environment. The targets of SDG no. 14 (to conserve and sustainably use the oceans, seas, and marine resources for sustainable development) do not fully capture this aspect but instead identify a selection of specific pressures and the effects of those pressures.¹⁹⁹ The CBD, however, requires states to identify and monitor “processes and categories of activities which have or are likely to have significant adverse impacts” on (marine and terrestrial) biodiversity, and to “regulate or manage the relevant processes and categories of activities” accordingly.²⁰⁰ Broadly speaking, these CBD provisions resemble the mitigation approach.

Another international example is the UNCLOS.

Its general provision to protect and preserve the marine environment could be interpreted to capture the mitigation approach,²⁰¹ yet the question is here if any of UNCLOS’ provisions includes to identify and address main pressures. UNCLOS includes specific provisions imposing upon states to adopt laws and regulations and to take other measures to prevent, reduce, and control pollution.²⁰² Thus, these specific provisions of UNCLOS require addressing some pressures, yet only those pressures that could be regarded as “pollution” (unlike, for example, (over)fishing and increased demand for space).

Now the first two themes of IOM and protecting the marine environment have been introduced. The next section discusses the third theme that concerns linking these two, as well as elaborating on other methods of the three Papers.

¹⁹⁹ UNGA/RES/70/1 “Transforming Our World: The 2030 Agenda for Sustainable Development.” In addition to SDG no. 14, SDG no. 13 on climate change captures one of the main pressures of this article. Jones Peter J. S., R. H. Murray, and O. Vestergaard, “Enabling Effective and Equitable Marine Protected Areas – Guidance on Combining Governance Approaches,” in *United Nations Environment Report* (2019), identifies the need to review impacts and influence human behavior accordingly, however seemingly only at a local scale, thereby not capturing the main global pressures.

²⁰⁰ CBD, art. 7(c) and art. 8(1). These requirements apply only “as far as possible and as appropriate.”

²⁰¹ UNCLOS, art. 192.

²⁰² *Ibid.*, art. 194 and arts. 207–12.

5 Methodology

5.1 Introduction and a note on law

The three methods and the Papers that employ them are the concept analysis of Paper I (section 5.2), the problem-based approach of Paper II and III (section 5.3), and the case study of Paper II (section 5.4). Section 5.5 explains how the methodology triangulates. The problem-based approach is novel and addresses the third theme of the dissertation. It is therefore discussed in more depth compared with the other two methods.

For convenience, the paper research questions and strategies will briefly be revisited. Paper I interrogates which formal norms, shared understandings, or guiding standards of IOM apply to state-level ocean management. Ruling out the existence of a legally binding specific norm on integrated ocean management, Paper I examines integrated concepts to ocean management in international legal and policy documents and instruments. The method employed, then, is a concept analysis. As the strategy indicates, Paper I perceives law as an articulated standard, which may be expressed as legally binding norms or as a concept of normative value. Section 5.2 explains the concept analysis in more detail.

The purpose of Paper II is to investigate how IOM is operationalized with regard to protection of the marine environment. By problem analysis, some premises of nature and scale of protecting the marine environment are identified. Problem aspects of protecting the marine environment are concretized and management implications for each problem aspect is deduced. Then, consistency between, on the one hand, problem aspects and implications, and, on the other hand, the case of IOM as per Paper II is assessed. Thus, Paper II employs a problem-based approach. Further, as Paper II applies the consistency assessment to a case, Paper II is also a case study, which section 5.4 discusses in more detail.

Paper III interrogates how an illustrative mandate of state ocean management contributes to protection of the marine environment. The interrogation requires to approach and concretize the complexities of protecting the marine environment. Paper III focuses on one problem aspect: to reduce the main environmental pressures. Then, Paper III identifies main environmental pressures and discusses whether the illustrative mandate is compatible with reducing each of the pressures. I consider the problem analysis and consistency assessments as employed in Papers II and III similar enough to be categorized as one method. Thus, Papers II and III both employ a problem-based approach. Section 5.3.1 elaborates on the employment. Section 5.3.2 explains how this method approaches complexity. Then, section 5.3.3 discusses how the method resembles (and differs) from some other methods and perspectives, yet is more suitable for the research questions posed.

The research strategies of Papers II and III take an instrumental view of law.²⁰³ Law is perceived as an instrument to govern or regulate behavior and activities for an objective.²⁰⁴ In Paper II, the instrumental view allows for discussion of how an existing management or regulatory instruments contributes to a particular objective. In Paper III, the instrumental view allows for discussion of the potential of and restrictions to an ocean management mandate in terms of its contribution to an objective. To discuss the potential and restrictions, Paper III outlines relevant regulatory responses theoretically available to reduce the main environmental pressures.²⁰⁵ Arguably, an instrumental view of law expands the research space for legal scholars, based on, for example, problem analysis. The responses to societal problems or objectives may be (partly) legal or regulatory and these responses may be limited by legal barriers or facilitated by new regulation. It could be noted that an instrumental view of law, embedded in management and governance,²⁰⁶ could be criticized as neoliberalism (as rational natural resource managerialism working on a global scale), for example, from a commons ontological position or through a biopolitical lens.²⁰⁷

5.2 The concept analysis

Concept analysis is one way of identifying and analyzing patterns; it is a generic qualitative research method.²⁰⁸ For convenience, the term concept means a set of abstract ideas (which may or may not be reconcilable in all aspects) that is constructed by high-level generalization. The construction through high-level generalization or abstraction is an exercise in finding pattern, thematic regularities,

²⁰³ Similarly, “instrumental views of law, which assess the contribution that law makes to the achievement of political or economic goals,” Wouter de Been, Sanne Taekema, and Bart van Klink, “Facts and Norms in Law: Interdisciplinary Reflections on Legal Method,” in *Facts and Norms in Law: Interdisciplinary Reflections on Legal Method*, ed. Sanne Taekema, Bart van Klink, and Wouter de Been (Cheltenham, UK: Edward Elgar Publishing, 2016), on p. 17. Also similarly, Cecilia Magnusson Sjoberg, “Introduction to Proactive Law,” *Scandinavian Studies in Law* 49 (2006), p. 1, describes how a proactive approach to law refers to “law as an instrument that can be shaped in a whole variety of ways, e.g. as a basis for legal risk analyses, legal system design and management.”

²⁰⁴ Law as governing behavior is captured as an element of a broader description of law by Little, “Developing Environmental Law Scholarship: Going Beyond the Legal Space,” on p 69, “law is one of society’s ways of mediating culture, articulating values and governing behaviour. It is therefore a key part of society’s attempts to frame, manage and communicate its response to global challenges, and legal and regulatory institutions are vital elements in societal governance and change.” Taekema and Klink, “Relative Autonomy: A Characterisation of the Discipline of Law,” p. 50 (implicitly) describes that law is also regulating activities.

²⁰⁵ Thus, providing normative recommendations, yet fleshing out recommendations’ provisional and tentative character in the problem analysis. See Burg, “The Need for Audacious, Fully Armed Scholars: Concluding Reflections,” p. 278.

²⁰⁶ Thus, arguably, this view of law could answer part of the vision of Larouche to position (a part of) legal scholarship in the middle of the other disciplines. Larouche, “A Vision of Global Legal Scholarship.”

²⁰⁷ Anna Grear, “Resisting Anthropocene Neoliberalism: Towards New Materialist Commoning?” in *The Great Awakening: New Modes of Life Amidst Capitalist Ruins*, ed. Anna Grear and David Bollier (Earth, Milky Way: Punctum Books, 2020), p. 324.

²⁰⁸ W. Lawrence Neuman, *Social Research Methods: Qualitative and Quantitative Approaches*, 3rd ed. (Boston: Allyn and Bacon, 1997), p. 421.

or “the general form for diverse objects that accounts for some kind of presumed identity between them,”²⁰⁹ for example, expressed as a concept. According to Davies, a “concept unifies things and provides coherence and the possibility for cognition of the objects of the world.”²¹⁰

Neuman explains “how qualitative researchers analyzes data by organizing it into categories on the basis of themes, concepts, or similar features.”²¹¹ Similarly, Paper I analyzes international legal and policy documents and instruments, identifies patterns and regularities, and organizes them into the category of normative concepts. The approach of Paper I fits the following description of generic qualitative studies of Locke et al., which explicate in a step-by-step manner how investigators approach this kind of research:

In most cases they follow these steps: (a) identify a conceptual model or theoretical framework for thinking about the research problem ..., (b) collect data through interviews, observations, or document analysis, (c) analyze the data through a process that identifies recurring patterns and thematic regularities, and (d) present conclusions in terms that use concepts from the initial framework.²¹²

This section will now explain how the concept analysis of Paper I was employed, structured by these steps, to find the normative concepts of integrated ocean management. As the steps by Locke et al. suggest, the conceptual model is identified in step (a). As the variants of the integrated concepts applicable to ocean management are many, the analysis required delimitation. I focused the analysis in three ways. First, the overall research question called for directing the analysis at combinations of “integrate” and ocean management, leading to one concept phrased as “integrated ocean management” or similar and another phrased as “integrate” or similar in combination with “concerns” or “considerations” (into an ocean management policy). Whereas these strong delimitations weaken the conclusions in Paper I, by excluding similar concepts phrased differently, they provided the analysis with a manageable scope. Second, the analysis was focused by taking a state perspective, which is particularly relevant in ocean management (Paper I and section 4.1.2). Third, the analysis focused on a normative perspective. The normative focus was chosen in an attempt to capture formal norms, shared understandings, or guiding standards relevant to states. Subject to these limitations, Paper I identified the integrated concepts applicable to ocean management as the object of analysis before the data (i.e. the international legal and policy documents and instruments) was examined, and the data were examined looking for those concepts. Thus, the approach was rather deductive, thinking

²⁰⁹ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 14.

²¹⁰ *Ibid.*, p. 14.

²¹¹ Neuman, *Social Research Methods: Qualitative and Quantitative Approaches*, p. 421. Further, Neuman states how “qualitative researchers form new concepts or refine concepts that are grounded in data. Concept formation is an integral part of data analysis and begins during data collection,” p. 421.

²¹² Lawrence F. Locke, Stephen J. Silverman, and Waneen Wyrick Spirduso, *Reading and Understanding Research*, 2nd ed. (Thousand Oaks, California: Sage Publications, 2004), p. 152.

about such concepts like a postulate to fill with content, unlike taking an inductive approach letting the data steer which conclusions to draw.²¹³

The delimitations and focal areas steered the data selection of Paper I, step (b), during which I primarily built on international legal and policy documents and instruments. These are essentially the implementation plan of the Rio Conference, Agenda 21, the CBD text and COP Decisions, the Integrated Coastal Zone Management protocol to the Barcelona Convention, and the Integrated Coastal Management Code and framework of the Partnerships in Environmental Management for the Seas of East Asia (section 1.1 and Paper I). In addition, I consulted scholarly legal literature. The investigation (for concepts of integration relevant to ocean management) in these documents and instruments revealed regularities of integrated concepts across the so-called hard and soft legal instruments.²¹⁴ As Paper I states, the form of these documents and instruments varies; some are treaty text, some treaty-like instruments, some goal-oriented policy documents, and some decisions providing guidance and recommendations for implementation. Yet, arguably all of them express the development of a shared understanding of the concept. Thus, I consulted all these documents and instruments insofar as they were relevant to the focal areas.

Relying on these documents and instruments, I argued in Paper I how a concept could be referred to as normative or a norm, provided it presented some normative characteristics. These normative characteristics were inspired by some of the legality criteria of Brunnée and Toope,²¹⁵ including broad support and endorsement, consistency over time, public availability, and congruence between a concept and official action (Paper I). Paper I was primarily inspired by those criteria that address the influence of a norm, unlike those that concern its content. I further argued that while “these criteria do not match those of a formal legal norm, they may sufficiently bolster the authority of the concept to justify characterizing it as a norm” (Paper I). Paper I assumed that because of these capabilities, states would desire to comply with them, and scholars would be interested to highlight them.

In the international legal and policy documents and instruments, the analysis revealed two different thematic regularities in step (c), equaling the two normative concepts of Paper I. These are (1) the framing of integrated ocean management as a management process and (2) the incorporation of environmental, economic, and social concerns into an ocean management policy. In the scholarly literature, neither these nor other single (or twin) integrated concepts of ocean management stood out. Rather, Paper I found that multiple variants existed and that integrated concepts to ocean management are broadly but not uniformly used. In the international legal literature, Paper I identified the

²¹³ J. B. Crozier, “Legal Realism and a Science of Law,” *The American Journal of Jurisprudence* 29, no. 1 (1984), p. 162, Davies, *Asking the Law Question*, p. 143.

²¹⁴ On soft and hard law, see for example, Dinah Shelton, “Soft Law,” in *Routledge Handbook of International Law*, ed. David Armstrong (London: Taylor & Francis, 2009), Lavanya Rajamani, “The 2015 Paris Agreement: Interplay between Hard, Soft and Non-Obligations,” *Journal of Environmental Law* 28, no. 2 (2016).

²¹⁵ Jutta Brunnée and Stephen J. Toope, *Legitimacy and Legality in International Law: An Interactional Account*, Cambridge Studies in International and Comparative Law (Cambridge: Cambridge University Press, 2010), p. 6.

regularity (or irregularity) that many scholars take their own analytical approach to integrated concept of ocean management, with varying premises and content. Thus, the selected premises influence the analysis more than any overarching pattern of integration in ocean management. This explains why the two norms of Paper I are not identified and discussed by other scholars (at least not in the same way). Other scholars rely on different data and select their focus and premises differently. Accordingly, finding these two normative concepts is a direct result of the selection of documents and instruments and choice of focus, rather than reflecting a uniform (or twin) integrated concept of ocean management.

My conclusions, step (d), of Paper I consist primarily of the identification of multiple concepts, emerging from the literature, and the two aforementioned norms or normative concepts based on the international legal and policy documents and instruments. Some disadvantages exist in searching and arguing for normative value of concepts, which section 6.2.4 will address.

5.3 A problem-based approach

5.3.1 Employment

This section explains how a problem-based approach is employed in Papers II and III. The approach consists of a problem analysis and a consistency assessment. The problem analysis of Papers II and III is largely presented in sections 4.4–4.6. The purposes of including it in this document are to show it, rather than describe it, and to enable readers to follow the reasoning and drawing of conclusions. Like section 4.4, Paper II focuses on the environmental objective, unlike the economic and social objectives, while Paper III briefly concretize the latter two. Further, having delimited the objective, the approach is to unpack some premises of nature and scale relevant to identifying problem aspects and implications. Then, when management intervention is discussed, the problem-study takes a state actor perspective.

The problem analysis led to the initial formulation of the mitigation approach that targets mitigation of the main pressures. It was formulated prior to the investigation of the IMM plans.²¹⁶ However, an initial investigation of the IMM plans could only fragmentarily identify the mitigation approach, which begged the question what was (were) the alternative approach(es) embedded in them? Therefore, the development and formation of the impact and activities approaches²¹⁷ spurred from the initial application of the mitigation approach to the IMM plans. Thus, the three approaches of Paper II are a result of a deductive–inductive analysis.²¹⁸ Combined with the problem aspects that

²¹⁶ See note 47 for details on these plans.

²¹⁷ The impact approach targets the combined impact of pressures on a smaller spatially defined area and the activities approach targets reduction of certain environmental harm caused by certain activities operating within a marine area, as per section 4.5.

²¹⁸ A deductive method investigates a posed hypothesis to be tested, as opposed to an inductive method where the hypothesis is created subsequent to observation and pattern recognition. See, for example, Peter Gavora, “The State-of-the-Art of Content Analysis,” *Education Sciences* 1 (2015), p. 15: “Direction of analysis is an essential constitutive component of content analysis. Deductive analysis employs the use of a priori set codes

Paper II deems out-of-scope (clean-up of already accumulated pollution and waste, the management of acute pollution risks, and some alternative measures to mitigation), the three approaches reflect a set of complementary problem aspects. They all require attention and response but contribute to protection of the marine environment in different ways.

Beyond identifying the three problem aspects, Paper II identifies, by deductive reasoning, implications of each of them in terms of scale, knowledge demands, and response. The deductive reasoning should not be confused with deduction as method. Rather, by deductive reasoning, I mean to implicate or draw as a logical conclusion consistency between a given element and an implication of it. In support of the reasoning, Paper II provides a rich description of what these implications entail and contrasts them. Whereas the resulting three approaches are exploratory, the argumentation is presented explicitly and transparently.

Having explained the three approaches, Paper II summarizes these in a table that is duplicated in Table 3.

<i>Approach</i>	<i>Target</i>	<i>Scale of target</i>	<i>Knowledge required (ideally)</i>	<i>Management response</i>	<i>Contribution</i>
(1) Mitigation	Pressures	Global Additional regional or local pressures in some areas.	Main pressures and how to abate them	Reduce pressures	Long-term protection and conservation of the global marine environment
(2) Impact	Impacts of pressures	Spatially limited area	Impact capacity of area, including ecosystems, natural systems, or single species	Locating, relocating, or restricting local manageable pressures	Reduce some environmental harm
(3) Activities	Certain effects of certain activities	Certain activities, for example operating in a spatially confined area	Combined effects of certain activities on certain ecosystems	Locating, relocating, or restricting activities	Certain local harmful effects are reduced

Table 3. Summary of the three approaches and their implications.

whereas inductive analysis involves code extracting from data. The former represents a top-down while the latter a bottom-up process.”

Each of the three approaches (column 1) has their distinctive target and scale (columns 2 and 3) as per their respective formulation (section 4.5). For example, as per the mitigation approach (row 2, column 1), to contribute to long-term protection of the marine environment (row 2, column 5) the IMM plans must target global pressures (row 2, column 2 and 3), therefore obtaining and providing knowledge on what these are and how to reduce them (row 2, column 4), and including responses that would reduce these pressures (row 2, column 5). One reason for compiling and contrasting these approaches is that they require distinct knowledge and responses. To analyze the contribution of the IMM plans to each of the approaches, Paper II investigated whether these implications were embedded in the case, which is explained in section 5.3. The degree of embedment enabled an assessment of whether the IMM plans adhere to the three approaches and consequently to which environmental objectives they contribute (column 6).

Paper III investigates the compatibility of a state ocean management mandate with mitigating the main pressures. The suggested and defined mandate or scope of ocean management capture the co-management of coastal communities, marine activities, and coastal and marine spaces. Paper III considers the mandate to be illustrative, in light of the choice of actor and a perception of what ocean management often captures.²¹⁹ Thus, Paper III explicates this restricted mandate in a transparent manner. Then, Paper III introduces certain environmental pressures. These pressures are caused by humans and human activities, which therefore fit with part of the mandate of ocean management (insofar as it concerns coastal communities and marine activities). Thereafter, Paper III discusses the extent to which co-managing coastal communities, marine activities, and marine spaces is the appropriate regime for reducing these pressures.

Accordingly, Paper II and Paper III are two examples of how a problem-based approach is employed to link (integrated) ocean management with protection of the marine environment to assess the contribution of the former to the latter. Paper II exposes a problem analysis and premises of protecting the marine environment (as per Table 3) to be aligned with a case of IOM. Paper III focuses on environmental pressures and exposes a scope of ocean management analyzing its compatibility with reducing those pressures.

5.3.2 Approaching complexity

The approach of this dissertation attempts to embrace the tension of duality of, on the one hand, to recognize the complexities of governance and of protecting the marine environment, and, on the other hand, to approach them one aspect at a time (problem-based management, choice of management problem/objective, problem aspect(s), intervention potential of one management actor, and

²¹⁹ For example, as per Craig and Hughes “Marine spatial planning or place-based management ... seeks to address all human uses of a particular marine environment in a comprehensive governance regime,” see Craig and Hughes, “Marine Protected Areas, Marine Spatial Planning, and the Resilience of Marine Ecosystems,” p. 113.

combining the latter two).²²⁰ The problem analysis of Paper II and the problem approach of Paper III are ways of approaching protection of the (marine) environment by concretizing and approaching problem aspects. This approach complements but differs from some scholars dealing with “environmental problems,”²²¹ “environmental issues,”²²² or “environmental management.”²²³ Fisher takes an approach highlighting complexity, stating that

[t]he polycentric, interdisciplinary, normative and scientifically uncertain nature of environmental problems leads to a body of environmental law in which it can be difficult to settle on a single frame for understanding a problem and thus to identify relevant parties, the relationships between them, and the courses of action that can be taken. Using Michel Callon’s terminology this can be understood as “hot situations” leading to “hot law.”²²⁴

I agree that settling on one frame for understanding a problem is difficult, as it would depend on, for example, existing knowledge on the problem and the purpose of approaching it (the research question posed) that depends on worldviews, ideals, and ontological and epistemological positions. Beyond Fisher, many scholars characterize environmental problems or issues as complex or similar. Patrício et al. claim that their “analysis shows that, because of its complexity, marine assessment and management constitutes a ‘wicked problem’”.²²⁵ Soininen also refers to “wicked environmental problems” as one of several perspectives.²²⁶ Kotzé refers to “the myriad complex regulatory challenges presented by the Anthropocene trope and its socio-ecological crisis.”²²⁷ Ruhl refers to the complexity of environmental issues/systems as a “mess.”²²⁸

²²⁰ Similarly, Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 4, “These constraints are questioned and we begin to come to terms with a post-binary world where apparent alternatives can both be true.”

²²¹ Elizabeth Fisher, “Environmental Law as ‘Hot’ Law,” *Journal of Environmental Law* 25, no. 3 (2013), p. 347; Daniel Bodansky, *The Art and Craft of International Environmental Law* (Cambridge, Massachusetts: Harvard University Press, 2010), prescribing diagnosis to the causes of environmental problems, p. 37, and “analytical tools (...) [that] could be applied to any environmental problem,” p. 57.

²²² Turner, “The Use of ‘Macro’ Legal Analysis in the Understanding and Development of Global Environmental Governance,” p. 254.

²²³ Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?”

²²⁴ Fisher, “Environmental Law as ‘Hot’ Law,” p. 347.

²²⁵ Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 1.

²²⁶ Niko Soininen, “The Structure, Form and Language of International Environmental Norms – from Absolute to Relative Normativity,” in *Research Handbook on Fundamental Concepts of Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2016), p. 249.

²²⁷ Kotzé, “Earth System Law for the Anthropocene,” p. 2.

²²⁸ J. B. Ruhl, “Thinking of Environmental Law as a Complex Adaptive System: How to Clean up the Environment by Making a Mess of Environmental Law,” *Houston Law Review* 34, no. 4 (1997), p. 935.

The question remains whether characterizing environmental problems as “hot,”²²⁹ “wicked,”²³⁰ or complex²³¹ invites an analysis of relevant responses. Research findings depend on how you define the problem,²³² and finding consistent responses to, for example, a wicked problem is likely to be extremely intricate or require high-level generalization (e.g., in the form of concepts). It remains to emphasize that the aforementioned scholars did not attempt to suggest relevant responses as per a problem-based approach. Rather, they approach the environmental problems or issues in a manner in suitable contrast to a problem-based approach. In comparison, Papers II and III concretize problem aspects based on problem-analysis.²³³ In the words of Bardwell (from a cognitive psychology and conflict management perspective):

Problem-framing emphasizes focusing on the problem definition. Since how one defines a problem determines one’s understanding of and approach to that problem, being able to redefine or reframe a problem and to explore the ‘problem space’ can help broaden the range of alternatives and solutions examined.²³⁴

Therefore, Paper II attempts to provide an overall problem analysis, and concretizes problem aspects, and Paper III builds on this approach.²³⁵ Aware that the approach could be criticized for being too simple, and at some point outdated, it provides an attempt of unfolding aspects of complexity, by a transparent problem account, thereby complementing more high-level generalizations.

The problem analysis could be accused of reductionism. I argue for the need for complementary approaches to those embracing complexity without falling into the trap of reductionism. Ruhl explains how reductionism

²²⁹ Fisher, “Environmental Law as ‘Hot’ Law,” p. 347.

²³⁰ Soininen, “The Structure, Form and Language of International Environmental Norms – from Absolute to Relative Normativity,” p. 249; Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 1.

²³¹ “[T]he complexities of the Anthropocene elude ‘the possibility of ‘solving’ it,” Vito De Lucia, “Rethinking the Encounter between Law and Nature in the Anthropocene: From Biopolitical Sovereignty to Wonder,” *Law and Critique* 31, no. 3 (2020), p. 338 (reference omitted).

²³² Bardwell, “Problem-Framing: A Perspective on Environmental Problem-Solving,” p. 605.

²³³ Aðalheiður Jóhannsdóttir, “The Value of Proactive Methodological Approaches for Understanding Environmental Law,” *Scandinavian Studies in Law* 59 (2014), p. 257, similarly says “how good understanding of environmental problems is without a doubt an asset,” relevant to some approaches to the challenges of methodology of environmental law.

²³⁴ Lisa V. Bardwell, “Problem-Framing: A Perspective on Environmental Problem-Solving,” *Environmental Management* 15, no. 5 (1991), p. 603.

²³⁵ Bodansky, *The Art and Craft of International Environmental Law*, also provides an overall problem account, p. 37, yet prescribes p. 57 a cure on the premise of an imaginary international environmental organization with what he claims as “broad authority” over environmental problems, unlike section 4.1.2, which focuses on a main actor, and section 6.2.3, which discusses appropriate intervention targets.

leads to the belief that an observable, complex phenomenon can be studied and fully understood by first reducing it to the simplest, indivisible subcomponents in operation during the phenomenon, then studying each of those subcomponents, and then reassembling them to gain a full understanding of the rules of operation of the whole phenomenon.²³⁶

Yet, I claim that we must also study the subcomponents without letting the complexity out of sight. This does not entail that identifying or studying each set of components is possible, or if it was, that it would provide a full understanding. This tension of opposites (of recognizing complexity yet studying components) resembles how systems thinker Pierson-Brown distinguishes between recognizing that “universal connectivity is a central tenet of systems thinking” and “raising ones conscious awareness of a discrete set of structures responsible for a behavior or outcome of interest” (author’s emphasis).²³⁷

Kotzé criticizes the “non-systems oriented approach” of IEL in a manner that could apply to a problem-based approach.²³⁸ Kotzé suggests three key problem characteristics of the Earth system:

(i) the all-inclusive nature of the Earth system; (ii) the complex interdependencies created by Earth system transformation; and (iii) the extreme complexity of Earth system transformations.²³⁹

Based on this, Kotzé envisions how Earth system law “would arguably have to fully embrace and respond to” these key problem aspects.²⁴⁰ Thus, Kotzé’s management response to the overall, and complex problem analysis is as complex as the problem, stating how “Earth system law must itself be a complex adaptive system that seeks to govern, in a mirror-like way, aspects of the Earth’s complex adaptive system.”²⁴¹ While the approach embraces the complexity of the Earth system, if this system cannot be approached in components, it appears analytically challenging if not impenetrable to me.

The point of departure of Kotze, alongside other scholars (many of which consider themselves Earth system law and Earth system governance scholars), is the Anthropocene.²⁴² Its many versions include a geological epoch that is characterized by human impact on the Earth’s geology and ecology but also versions similar to a problem analysis, such as “the rapid decline of Earth system integrity that is associated with a significant rise in greenhouse gas emissions, population growth, increased

²³⁶ Ruhl, “Thinking of Environmental Law as a Complex Adaptive System: How to Clean up the Environment by Making a Mess of Environmental Law,” p. 937.

²³⁷ Tomar Pierson-Brown, “(Systems) Thinking Like a Lawyer,” *Clinical Law Review* 26, no. 2 (2020), p. 534.

²³⁸ Kotzé, “Earth System Law for the Anthropocene,” p. 5.

²³⁹ *Ibid.*, p. 6.

²⁴⁰ *Ibid.*, p. 6.

²⁴¹ *Ibid.*, pp. 8–9.

²⁴² *Ibid.*

industrialization, urbanization and consumption, increased biodiversity loss, and possibly even a Sixth Mass Extinction”.²⁴³ Whereas Earth system law, somewhat similarly to this dissertation, departs from a problem analysis, in suggesting responses, the approaches fundamentally differ.

Nonetheless, I highlight the need for plural perspectives complementing each other in terms of abstraction level and which connections or components they embrace. As put by Meadows departing from a system perspective:

I don't think a systems way of seeing is better than the reductionist way of thinking. I think it's complementary, and therefore revealing. You can see some things through the lens of the human eye, other things through the lens of a microscope, others through the lens of a telescope, and still others through the lens of systems theory. Everything seen through each kind of lens is actually there. Each way of seeing allows our knowledge of the wondrous world in which we live to become a little more complete.²⁴⁴

I find this is the beauty of academic research—the refreshment from (and necessity of) different perspectives, reflecting “current intellectual preference, in favor of plural explanations (complexity, diversity, deconstruction).”²⁴⁵

5.3.3 Perspectives resembling a problem-based approach

A problem-based approach will now be compared with some existing approaches that it resembles to unwrap its further content and suitability for the research question, and to position it amongst existing literature. Little argues for developing legal scholarship, and classifies as “novel” legal scholarship (unlike “classic”) that which “seeks to analyze how governance and regulation interact with often highly polycentric environmental themes and phenomena.”²⁴⁶ Further, Little claims how such novel “legal scholars must develop ideas on how to interact with public policy and sometimes competing non-legal economic and social science concepts and methods.”²⁴⁷ Similarly, a problem-based approach seeks to analyze management and legal implications of environmental problems and interacts with social science concepts, such as governance, as well as the concepts of ocean governance. Furthermore, Little explains how it is

often difficult for this kind of scholarship to connect its analyses with the intellectual excitement of meta-level debates about the environment ... For while scholarship in environmental sciences, policy studies and economics can address big issues such as the causes of climate change and how society can and should react, legal research necessarily

²⁴³ Ibid, p. 3.

²⁴⁴ Meadows and Wright, *Thinking in Systems: A Primer*, p. 7.

²⁴⁵ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 11.

²⁴⁶ Little, “Developing Environmental Law Scholarship: Going Beyond the Legal Space,” p. 49.

²⁴⁷ Ibid, p. 58.

tends to focus narrowly on detailed, follow-up analyses of the legal/regulatory structures and processes that have been put in place to implement society's response.²⁴⁸

I do, however, embrace some of Little's big issues, or macro perspectives, through approaching how to protect the marine environment. It remains to specify that the macro perspective adopted by this dissertation is in terms of this "macro" management objective. Other facets of this dissertation are comparably "micro," for example the governance approach, which delimits the type of management and management actor it claims relevance for.

Turner inquires for the use of macro legal analysis in the understanding and development of coherent strategies to further global environmental governance,²⁴⁹ which the problem-based approach roughly responds to. Yet, Turner's macro legal analysis deviates from a problem-based approach, by seeking to understand how law influences the environment.²⁵⁰ The overall research question of this dissertation, however, seeks to, first, understand or concretize the environmental problems or objectives, then to identify basic premises of law and management consistent with these. Thus, the problem-based approach investigates how environmental problems should influence law, which is therefore, put simply, diametrically different in this aspect from Turner's investigation of how law influences the environment. Nonetheless, Turner includes as a core element that "in addressing the various legal disciplines applicable to the environmental issue or which have the potential to affect it, the elements of the law that are found to comprise the 'root causes' or 'drivers' of environmental harm need to be properly identified."²⁵¹ The latter part of this that points to root causes or drivers reflects, largely, the mitigation approach of Papers II and III.

Further, a problem-based approach bears resemblance to the policy approach as adopted by Bodansky.²⁵² This approach focuses on how the law should be including questions such as what the goal of international policy should be, who should promulgate the policy, what the legal form of the policy should be, what policy instruments we should use, and who these policy instruments should be directed at.²⁵³ A problem-based approach rather discusses what law could be (provided a certain problem is prioritized). Consistent implications of the problem such as scale, responses, or

²⁴⁸ Ibid, p. 59.

²⁴⁹ Turner, "The Use of 'Macro' Legal Analysis in the Understanding and Development of Global Environmental Governance," p. 238.

²⁵⁰ Ibid, p. 242, describes macro legal analysis as "the process of discovering and analyzing the full range of laws, legal institutions and quasi-legal initiatives that have an influence upon environmental outcomes." Similarly, Cary Coglianese and Catherine Courcy, "Environmental Regulation," in *The Oxford Handbook of Empirical Legal Research*, ed. Peter Cane and Herbert M. Kritzer, Oxford Handbooks in Law (Oxford: Oxford University Press, 2010), p. 460, discusses empirical research examining how behavioral change induced by environmental law has implications for environmental conditions.

²⁵¹ Turner, "The Use of 'Macro' Legal Analysis in the Understanding and Development of Global Environmental Governance," p. 253 (reference omitted).

²⁵² Bodansky, *The Art and Craft of International Environmental Law*, p. 6.

²⁵³ Ibid, p. 6.

competence area are identified.²⁵⁴ This entails that I, the author taking a problem-based approach, do not have to recommend a specific response but rather expose consistent implications for law and management of a specified problem. Somewhat in contrast, Bodansky states how “[i]deally, in developing a policy strategy, we would identify the range of options for each variable, evaluate their desirability, and decide which represents the best mix of ambition and realism.”²⁵⁵ Accordingly, a problem-based approach provides space to outline premises of law and management without demanding specific recommendations, which make it eligible for approaching the macro objective of protecting of the marine environment.²⁵⁶ Another difference between Bodansky’s approach and a problem-based approach is that I refer to some implications as regulatory rather than policy. One explanation of this difference is the state perspective I take, which means that I am discussing the options available to the actor with regulatory capacity.

Further, a problem-based approach has similarities to parts of the approach of Westerlund.²⁵⁷ Westerlund describes how sustainable development could be interpreted from an “internal legal approach,” meaning how it is expressed in international and national law and as expressed in various instruments of soft and hard law.²⁵⁸ Further, sustainable development could be considered from somewhere outside law, which is what Westerlund does by defining overall goals and sub-goals.²⁵⁹ Similarly, a problem-based approach considers protection of the marine environment from outside law unlike how it is expressed in international and national law. However, instead of defining goals (reflecting desired achievements) like Westerlund, the approach concretizes problem aspects in an attempt to target the problems.

Aspects of the mitigation approach of Papers II and III slightly correspond to how Fisher explains environmental problems as “collective action problems” requiring “choices to be made about what is an acceptable and unacceptable impact on the environment and whose activities must be curtailed or adjusted to deal with those impacts.”²⁶⁰ Further (noting that Fisher’s paper is on a national

²⁵⁴ Somewhat similarly, Seipel suggests probing or speculating law (“lex ponderanda”), yet points to how it is complex and controversial as “the issue of *who* speculates about the future is very close to the issue of *whose description* of the future should guide regulatory work”. For this reason, a problem-based approach makes the problem description explicit and transparent. See Peter Seipel, “Nordic School of Proactive Law Conference, June 2005 Closing Comments,” *Scandinavian Studies in Law* 49 (2006), pp. 362–63.

²⁵⁵ Bodansky, *The Art and Craft of International Environmental Law*, pp. 6–7.

²⁵⁶ *Ibid.*, p. 6.

²⁵⁷ Staffan Westerlund, *En Hållbar Rättsordning: Rättsvetenskapliga Paradigm Och Tankevänder* (Uppsala: Iustus, 1997). The Swedish title means “Sustainable Development and the Legal Order: Legal Scientific Paradigm and Trains of Thought” (author’s translation).

²⁵⁸ *Ibid.* p. 25.

²⁵⁹ *Ibid.*, on p. 43 onwards. Westerlund’s approach is also explained by Jóhannsdóttir, “The Value of Proactive Methodological Approaches for Understanding Environmental Law,” p. 249.

²⁶⁰ Fisher, “Executive Environmental Law,” p. 166. Unlike Paper II, which analyses the main pressures on the global marine environment to reach these findings, Fisher states this citing G. Hardin, “The Tragedy of the Commons,” *Science* 162 (1968), p. 1243.

environmental draft bill), Fisher points to states to address these problems.²⁶¹ Yet, Fisher discusses not only the legislative capacity of states but complements it with the public administrations and the courts, arguing that all arms of government must be involved for the purpose of legitimacy.²⁶² In contrast, this dissertation only discusses the regulatory capacity of states.

The focus on the regulatory capacities of states may bring associations with legisprudence, the theory on the creation of law or legislation.²⁶³ Legisprudence is a generic theory on legislation, including regulatory cycles and legislative techniques and styles.²⁶⁴ Much of its scholarship is un-specific to the regulatory need, and (seemingly) relevant to any objective or problem. In contrast, this dissertation investigates a specific objective or problem, to unearth consistent regulatory or management implications. However, it does not discuss the local legislative context of states but discusses regulatory needs and options on a non-state-specific overall level. Thus, this dissertation situates itself more “upstream” than legisprudence (or “post-national” as in the words of Larouche).²⁶⁵ By focusing on environmental regulatory needs, it captures only one of the streams of regulatory needs which legisprudence theorizes how to implement in legislation.

5.4 The case study

5.4.1 A note on the choice of category

This method is categorized as a case study primarily because it studies an operationalized case of IOM, in comparison with the concepts that Paper I studies and the illustrative mandate that Paper III studies. To some degree, the study adheres to the scope of a case study as a(n) (empirical)²⁶⁶ research method,²⁶⁷ in that it investigates the Norwegian IOM regime in-depth and within a real-world context of environmental problems and approaches relevant to states pursuing protection of the marine environment. The study is instrumental as the intent is to understand the problem of how ocean management of a state contribute to protection of the marine environment.²⁶⁸ Prior to the study, the boundaries between the regime and this problem are not evident.

²⁶¹ Ibid, p. 166.

²⁶² Ibid, p. 166.

²⁶³ Luc J. Wintgens, *The Theory and Practice of Legislation: Essays in Legisprudence*, (New York: Routledge, 2017), pp. ix–x.

²⁶⁴ See, for example, Ulrich Karpen, “Introduction,” in *Legislation in Europe: A Comprehensive Guide for Scholars and Practitioners*, ed. Ulrich Karpen, et al. (Oxford: Hart Publishing, 2017), pp. 3–4.

²⁶⁵ Larouche, “A Vision of Global Legal Scholarship,” p. 207.

²⁶⁶ Shari Seidman Diamond and Pam Mueller, “Empirical Legal Scholarship in Law Reviews,” *Annual Review of Law and Social Science* 6, no. 1 (2010), in the abstract, defines empirical scholarship as “the systematic organization of a series of observations with the method of data collection and analysis made available to the audience.”

²⁶⁷ Robert K. Yin, *Case Study Research and Applications: Design and Methods*, 6th ed. (Los Angeles: SAGE, 2018), p. 15.

²⁶⁸ Unlike focusing only on the case itself. John W. Creswell and Cheryl N. Poth, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, 4th ed. (Thousand Oaks, California: SAGE, 2018), p.

Yet, other features of the study do not immediately comply with those relevant to (empirical) case studies, as concerns the feature of reliance on multiple sources of evidence.²⁶⁹ Rather, the study captures the case of IOM primarily as it appears from the policy documents that explain and operationalize the Norwegian IOM regime, the IMM plans.²⁷⁰ In contrast, the study does not capture the phenomenon of IOM from multiple sources, nor from the sources typically associated with empirical research (observations, experiments, interviews). Nonetheless, as the approach has triggered questions regarding criteria of selection, representativeness, and some context-dependent elements, I find that it is appropriately framed as a case study.²⁷¹ Moreover, the study conforms with primary aspects of case studies that according to Miller “provide vital and unique contributions to law and social science research.”²⁷² Miller explains how inductive analysis is useful in case studies for theory building:

Where a researcher confronts a lack of systematic prior analyses, or believes conventional wisdom to be misleading or downright incorrect, case studies are a particularly useful approach for the kind of inductive analysis that theory building requires.²⁷³

Skeptical of conventional perceptions that IOM contributes to protection of the marine environment, Paper II has through the case study challenged existing theory on this point and addressed the need for greater theorization of protection of the marine environment.

However, from the perspective of the limited set of sources, the question emerges whether the case is rather an example, in terms of being an artificial or academic example to illustrate a point (or three), thus detached from its context in terms of context available through complementary sources. I focus on the IMM plans without including, for example, a full study of the regulatory context within which the Plans interconnect, their implementations, how they were prepared and are consumed, institutional or other contexts. The selection of the Plans in isolation from these contexts could be considered as artificial and academic, thus an example.

The research question interrogates for integrated ocean management as operationalized. As I argue in Paper II, the IMM plans stand out among regulatory instruments, in titling and presenting themselves as integrated or holistic management plans, aiming to connect and combine management

98–99; Larry S. Luton, *Qualitative Research Approaches for Public Administration* (Armonk, N.Y: M.E. Sharpe, 2010), p. 126.

²⁶⁹ Yin, *Case Study Research and Applications: Design and Methods*, p. 15.

²⁷⁰ Section 5.4.2 describes these plans in more detail.

²⁷¹ The flexibility of a case study includes approaching it as an enquiry strategy, method, or research strategy, and that it arguably is “defined not so much by the methods that you are using to do the study, but the edges you put around the case” Creswell and Poth, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, p. 96 (reference omitted).

²⁷² Lisa L. Miller, “The Use of Case Studies in Law and Social Science Research,” *Annual Review of Law and Social Science* 14 (2018), p. 385.

²⁷³ *Ibid*, p. 384.

measures for environmental and other purposes.²⁷⁴ In addition to the holistic self-presentation, the Plans do not indicate that they exclude some environmental objectives; therefore, they do not explicitly exclude the targets of my three approaches. Nonetheless, Norway has measures responding to, for example, important pressures on the marine environment that are not included in the IMM plans, and I refer to these in Paper II, although they are not embedded in the plans. Had I included a broader range of regulatory and management instruments that I deem relevant to protect the marine environment (such as companies and activities regulation, climate regulation, the pollution act, and education and biodiversity policies), the focus of the analysis would have shifted and expanded. It would have entailed a shift from an analysis of the potential of an ocean management policy to meet environmental objectives (which correlates to the research question), to an analysis of the potential of the state of Norway to protect the marine environment, (which does not correlate to the research question). Thus, despite the existence of complementary instruments, regulations, and other data, the research question supports the approach of mapping the delimited scope of the IMM plans and referring to regulation outside the plans where relevant.

5.4.2 Employment of the case study method

The reasons for choosing Norway as a case study are threefold as set out in Paper II. First, the Plans aim for protection of the marine environment by connecting and combining multiple management measures.²⁷⁵ Second, scholars applaud the Norwegian plans as best practice in its area,²⁷⁶ and the government's goal is "for Norway to be a pioneer in developing an integrated ecosystem-based management regime for marine areas."²⁷⁷ Third, the Plans adhere to the two international norms and standards of IOM that Paper I discusses. In combination, these reasons bolster the case of Norway as a critical case that has strategic importance in relation to the general problem.²⁷⁸ The third reason also supports the representativeness of the case of Norway to a broader range of states that adhere to these

²⁷⁴ Title of the most recent Plan in Norwegian is "Helhetlig forvaltningsplaner for de norske havområdene - Barentshavet og havområdene utenfor Lofoten, Norskehavet, og Nordsjøen og Skagerrak," which, as translated by the author, means "Integrated (or holistic) management plans for the Norwegian marine areas – the Barents Sea and ocean areas outside Lofoten, the Norwegian Sea, and the North Sea and Skagerrak."

²⁷⁵ For example, evident in the "vision to safeguard a clean and rich sea, so that future generations can continue to harvest the wealth of resources that the sea has to offer," in "Protecting the Riches of the Sea. Report to the Storting No. 12," (2001-2002), p. 7, and reiterated in each of the management plans; and in "maintaining a long-term, integrated marine environmental policy that is intended to facilitate value creation and at the same time protect the marine and coastal environment," "Integrated Management Plan for the Marine Environment of the Norwegian Sea, First Update. Report to the Storting No. 35," p. 5.

²⁷⁶ Charles N. Ehler, "Pan-Arctic Marine Spatial Planning: An Idea Whose Time Has Come," in *Arctic Marine Governance: Opportunities for Transatlantic Cooperation*, ed. Elizabeth Tedsen, Sandra Cavalieri, and R. Andreas Kraemer (Berlin, Heidelberg: Springer Berlin Heidelberg, 2014), abstract; Alf Håkon Hoel, "Integrated Oceans Management in the Arctic: Norway and Beyond," *Arctic Review* 1, no. 2 (2010), p. 188.

²⁷⁷ "Integrated Management of the Marine Environment of the North Sea and Skagerrak (Management Plan). Report to the Storting No. 37," p. 13.

²⁷⁸ Bent Flyvbjerg, "Five Misunderstandings About Case-Study Research," *SAGE Qualitative Research Methods* 12, no. 2 (2010), pp. 229–31.

norms and standards. The representativeness is further evident by the focus of Paper II on the generic macroecological perspective and the formal jurisdictional powers equally vested in states. Thus, these focal areas are relevant to all states, although the type of activities and marine areas and the priorities and available resources may vary from state to state.

The plan material include the seven plans that I refer to as the IMM plans.²⁷⁹ The most recent IMM plan was published on April 24, 2020.²⁸⁰ It updates the former ones, although not in the form of a replacement of the previous plans, but rather is a new plan that does not replace the previous plans entirely, but builds upon them.²⁸¹ The most recent IMM plan concerns the entire marine areas where Norway has extended entitlements in one plan, unlike its six predecessors, each of which approaches one of three geographically divided parts of these marine areas.²⁸² The management regime set out in the plans was first launched in the white paper *Protecting the Riches of the Seas* of 2001.²⁸³ The pile of partly uncoordinated documents underlying these before three sets of plans, now combined into one plan, is voluminous. Each plan build on a set of documents referred to as the factual or scientific bases of the IMM plans.²⁸⁴ These were also examined to the extent relevant to the research question (unlike, for example, those that concerned economic considerations of marine activities). The reasons for emphasizing these intricacies and the quantity of the plan material is, first, that analyzing it has been a demanding and time consuming part of the dissertation. Second, the plan material results in some risk that I may have overlooked or not perceived the full picture of parts of the Plans, or that the full picture of the IMM plans is not entirely uniform. Regardless, the pile of plans has allowed for a comparison of the text across the plans.

The IMM plans do not explicitly adhere to the three approaches, which is developed in Paper II, but include specific statements to this end as Paper II explains. Thus, contribution of the plans, assessed by the degree of embedment of the three approaches, is a result of content analysis²⁸⁵ of the IMM plans.²⁸⁶ A content analysis could be qualitative or quantitative. Although the categorization and alignment with the implications as per a problem-based approach vaguely resemble counting and measuring (as in quantitative analysis), the “measurement” requires complex interpretations.²⁸⁷

²⁷⁹ See note 47 for details on these plans.

²⁸⁰ “Integrated Management Plan for the Norwegian Marine Areas. Report Nr. 20 to the Storting.”

²⁸¹ *Ibid.*, pp. 13–14.

²⁸² *Ibid.*, p. 13.

²⁸³ “Protecting the Riches of the Sea. Report to the Storting No. 12.”

²⁸⁴ “Integrated Management Plan for the Norwegian Marine Areas. Report Nr. 20 to the Storting,” p. 11. The reports that constitutes the scientific bases are available at <https://havforum.miljodirektoratet.no/kunnskapsgrunnlaget/>.

²⁸⁵ Kristina Boréus and Göran Bergström, *Analyzing Text and Discourse: Eight Approaches for the Social Sciences* (London: SAGE, 2017), p. 24. Glenn A. Bowen, “Document Analysis as a Qualitative Research Method,” *Qualitative research journal* 9, no. 2 (2009), p. 32.

²⁸⁶ Boréus and Bergström, *Analyzing Text and Discourse: Eight Approaches for the Social Sciences*, p. 24.

²⁸⁷ *Ibid.*, p. 24.

Therefore, the analysis is relatively qualitative unlike quantitative. The content analysis will now be explained in more detail.

At the outset, I read the text of the plans relying on their literal meaning. As I argue in Paper II:

A fine line exists between vivid, visionary language and promises and commitments to objectives. Yet, one can interpret the IMM plans as a genuine attempt to protect the marine environment, as reflected not just in these formulations, but also in the scientific and administrative resources invested in the plan-making procedures, their adoption at the highest ministerial level, their political importance as reflected in their inclusion in majority government platforms, and the final endorsement of the plans by the Norwegian Parliament. (Paper II)

Thus, these plans are drafted to be read, used, and understood by a broad audience of bureaucrats, politicians, managers, and stakeholders, and these different actors must be able to rely on texts. The perception implicit in these arguments is that these documents have some “authority” (certainly reflecting the realistic tradition I come from).²⁸⁸ Even if this perception is useful when norms and regulations shall be adhered to and implemented uniformly by multiple persons and entities, the ocean governance scholar or legal scholar may certainly take a different position. Nonetheless, for the purpose of Paper II, the documents were relied on as relevant to and interesting for the investigation.

In a voluminous pile of documents like the IMM plans, less effort is invested in each single formulation. Thus, compared with how I, for example, would read a section of a statutory act, I read the text in a less literal manner, ensuring that the parts of the text that I rely on do not stand out compared with the section it belongs to, the plan at hand (including introductions and summaries), or compared with the other plans. For example, this way of reading made me realize that the IPBES four direct drivers described in the most recent plan were actually the five drivers as mentioned in the summary.²⁸⁹ Another example of a text section of the IMM plans that did stand out, is explained in footnote 77 of Paper II. As the footnote explains, certain formulations of the IMM plans were not interpreted literally. I did not consider it appropriate to make more of a point out of these formulations, exactly because of the uncertainty attached to their literal meaning that stood out compared with other sections and previous plans. Moreover, it could be noted that I did also search for evidence contradicting the deductively employed mitigation approach. This is evident in the conclusions that finds that it is only embedded in a fragmented way. Finally, it could be noted that some risk in the study is inherent both in the simplified criteria, requiring logical systematical application, which may

²⁸⁸ Unlike, for example, taking a constructivist approach to document analysis, in which a document cannot be detached from its social context, both its production and consumption process, as the document is nothing but a lifeless material without a social situation. Nanna Mik-Meyer and Lise Justesen, “Dokumentanalyse,” in *Paradigmer i praksis: Anvendelse af metoder til studier af organiserings- og ledelsesprocesser*, ed. Per Darmer (København: Handelshøjskolens Forl, 2010), pp. 283 and 285.

²⁸⁹ As explained in footnote 62 of Paper II.

not necessarily fit with the reality behind an instrument that is a political compromise. Further, risk is inherent in the interpretative alignment from which I conclude on the (limited) contribution.

5.5 Triangulation

I will now briefly describe how the methodology triangulates or combines as a process of cumulative validation²⁹⁰ in response to the overall research question. The overall research question – the potential of IOM to contribute to protection of the marine environment – essentially addresses three themes (where the third links the first and the second), as explained in section 1.2 and as illustrated in the tabular overview of the research design in section 2.3.

With respect to the first theme of this dissertation, Paper I provides a concept analysis of integrated approaches to ocean management including IOM.²⁹¹ Following this analysis, I was puzzled how the IOM concept could possibly contribute to a broad set of societal objectives including protection of the marine environment.²⁹² Then, the case study in Paper II showed that IOM contributed to that objective in a fragmented way. In the face of those different results, I adopted two strategies. The first was to conduct another investigation of the contribution of ocean management to protection of the marine environment, applied to a different “case” (the illustrative mandate of Paper III). Paper III supported the conclusion of Paper II, thus providing cumulative validation to this end. The second strategy was to investigate some characteristics of IOM and concepts similar to IOM more closely, including the critical investigation of sections 3.1 and 3.4–3.5 and the investigation of how such concepts relate to governance and basic features of management of section 4.1.²⁹³ In combination, these strategies indicate the robustness of the study.

For the second theme of protecting the marine environment, the problem analysis and the case study of Paper II have been vital. The case study provided a strong “force of example”²⁹⁴ as alternative to the conceptualization of problems and responses in one that does not specify problem aspects and implications. The in-depth analysis of Paper II of complex documents, in relation to a set of carefully developed categories, did not allow for a similarly comprehensive analysis in Paper III.²⁹⁵ Nonetheless, Paper III reinforced the mitigation approach as a core problem aspect of marine environmental protection, thus providing cumulative validation to this end.

²⁹⁰ Udo Kelle, “Sociological Explanations between Micro and Macro and the Integration of Qualitative and Quantitative Methods,” *Forum, Qualitative Social Research* 2, no. 1 (2001), p. 5. Similarly, Bowen, “Document Analysis as a Qualitative Research Method,” p. 28.

²⁹¹ Creswell and Poth, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, p. 48, note how beginning a study focusing on a single concept before advancing to relating factors is a feature of a “good” qualitative study.

²⁹² An evolving design is another feature of a “good” qualitative study, as per *ibid*, p. 47.

²⁹³ Using multiple levels of abstraction is another feature of a “good” qualitative study, *ibid*, p. 49.

²⁹⁴ Flyvbjerg, “Five Misunderstandings About Case-Study Research,” p. 228.

²⁹⁵ Nanna Mik-Meyer, “Metodekombination” (Combining Methods), in *Paradigmer i praksis: Anvendelse af metoder til studier af organiserings- og ledelsesprocesser*, ed. Per Darmer (København: Handelshøjskolens Forl, 2010), p. 336.

The third theme concerns the development of a problem-based approach as a means to assess the contribution of IOM to protection of the marine environment. The successful employment of this exploratory method to two different variants of IOM—a set of plans and an illustrative mandate—increases its validity. Moreover, this approach has certain analytical generalizability,²⁹⁶ in terms of the problem analysis, how it highlights different targets, how it separates between problem aspects, how it deduces implications of them, how it categorizes these implications,²⁹⁷ and how it assesses consistency.

²⁹⁶ Justesen and Mik-Meyer, *Qualitative Research Methods in Organisation Studies*, p. 42; Yin, *Case Study Research and Applications: Design and Methods*, p. 45.

²⁹⁷ Boréus and Bergström, *Analyzing Text and Discourse: Eight Approaches for the Social Sciences*, p. 30, on how analytical categories could be a main result in itself.

6 Theme Findings and Reflections

6.1 IOM and integrated approaches

This section now presents findings and reflections on the first theme regarding IOM and the integrated approaches to ocean governance. For convenience, I will briefly reiterate the terminology presented in sections 1.1 and 3.3. The integrated concepts or approaches to ocean governance are many and varied. IOM capture the kind of integration (of a concept or practiced manifestation thereof), which refers to the capacity to respond or contribute to a broad set of objectives relevant to marine management. Concepts similar to IOM that capture this kind of integration are (versions of) the ecosystem approach to ocean governance, marine environmental management approaches, and marine spatial planning. I will now provide some findings and reflections on some inherent properties of IOM and the concepts similar to IOM, some explicit and inexplicit premises of integrated approaches to ocean governance, and whether perceiving IOM as a imagined-practiced reality would influence these findings.

6.1.1 Mind the marginalized and excluded issues

Sections 1.1 and 3.1 has shown that the field of study of ocean governance feeds and breeds on its concepts and huge research investments rest upon them.²⁹⁸ Further, we have seen that integrated approaches to ocean governance and management are widely offered as responses to environmental, economic, and social objectives and problems (section 1.1, Paper III). Certainly, others have acknowledged weaknesses of concepts of ocean governance. For example, Craig notes how “it must never be forgotten that marine spatial planning is not a panacea that can resolve all marine governance issues.”²⁹⁹ Other scholars note the disadvantages of these concepts, letting them weaken but not steer the conclusions.³⁰⁰

Two reasons exist to be inherently skeptical about high-level conceptualizations of responses to societal objectives relevant to different management actors. The first reason, from a researcher’s

²⁹⁸ For example, “Since 1999, at least 27-research projects focusing on coastal and marine habitats have used (or are using) the DPSIR framework and/or derivatives as part of their conceptual development phases“, Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 6; the EU Horizon Europe proposed project as per Lamy et al, “Proposed Mission: Mission Starfish 2030: Restore Our Ocean and Waters.”

²⁹⁹ Robin Kundis Craig, “Ocean Governance for the 21st Century: Making Marine Zoning Climate Change Adaptable,” *The Harvard Environmental Law Review* 36, no. 2 (2012), pp. 349–50. Similarly, Ehler, Zaucha, and Gee, “Maritime/Marine Spatial Planning at the Interface of Research and Practice,” p. 13, “MSP is not a universal remedy.” Also similar, Craig and Hughes, “Marine Protected Areas, Marine Spatial Planning, and the Resilience of Marine Ecosystems.,” p. 136. Scott, “Integrated Oceans Management and Climate Change,” p. 311, “IOM in no case is fully comprehensive, and typically excludes fisheries management.”

³⁰⁰ For example, Kelly et al, “Investigating Options on How to Address Cumulative Impacts in Marine Spatial Planning,” p. 144, list the multiple difficulties of MSP’s potential to address cumulative impacts, then state how the concept is nonetheless deemed relevant despite the difficulties. Langlet and Rayfuse, “The Ecosystem Approach in Ocean Planning and Governance: An Introduction,” p. 2, explain that despite the challenge of complexity and universal relevance, an ecosystem approach to ocean governance is well established and “often seen as a prerequisite for successful management.”

perspective, is the questionable ability of such concept to be relevant to and appropriate for a range of different research questions concerning ocean governance or marine management. The second reason, from a governance perspective, is the questionable ability of such a concept to capture what is relevant to very different ocean management actors in response to potentially conflicting societal objectives. These actors and some examples of ocean-related considerations they could face are the Prime Minister of Singapore considering new land reclamations in a national strategy for industrial development, the Fisheries and Oceans Minister of Canada considering how to protect vulnerable whale species by coastal area-based restrictions, Greenpeace and the Arctic Council considering reduction of marine litter, and an administrative case worker in Iceland considering restrictions on certain fishing gear.

In light of Figure 3 (that illustrates the actor, the concept as a lens, and the problem or objective) one could imagine all these diverse actors on the left-hand side, all committed to “science-based” approaches, thus relying on the integrated concepts of ocean governance. The potential vested in their formal (and informal) powers vary starkly. Conflicting objectives are vested in all the considerations of the example. Thus, their knowledge need vary starkly. What would generalizing across these variables result in? It results in that the complex considerations of conflicting societal objectives and the different intervention potential of these actors is marginalized or excluded.

The exercise of abstraction “to unify things and provide coherence and possibility for cognition of the objects of the world”³⁰¹ reflects a knowledge need. Research is called on to provide knowledge on how to understand and intervene in confronting the problems of the ocean (section 1.1). Yet, any grand-scaled attempt to unify and provide coherence to this end would marginalize some variables and exclude others. The more high-level the abstraction, the more variables it captures that potentially would be marginalized or excluded. This is not a problem in itself, insofar as these premises are explicit and transparent. I argue that the demand for explicit and transparent premises is particularly strong if the approach, such as an integrated approach (to ocean governance), brings holistic or comprehensive associations (unlike reductive).

The challenge of complexity (sections 4.1 and 5.3.2) make it important to specify which issues integrated approaches to ocean governance can resolve and which are those excluded and marginalized issues that need to be attended to.³⁰² Concluding section 7 and Paper III set out some excluded and marginalized issues of IOM. Moreover, IOM and the concepts similar to IOM, as lenses pretending to be relevant to management actors to achieve societal objectives, do not magnify (or clarify) the conflicting objectives and the management options. What, then, is magnified? The lenses risk magnifying basic features of management framed as something more ambitious.

6.1.2 Explicit and implicit premises

The pretense-of-relevance to multiple management actors in response to multiple objectives, as sections 3.4–3.5 has shown, is one explicit premise of IOM and concepts similar to IOM. I argue that some other premises of integrated approaches to ocean management could generally be clarified in a

³⁰¹ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 14.

³⁰² *Ibid.*, p. 4.

transparent manner. The premises in mind include an unclear approach to governance that could lead to, for example, an exaggerated focus on process management and an unclear or intransparent problem perception or problem analysis. Governance is a dense term, rich with issues and variables, capturing the complexity of human (or ecosystem) interaction. Naturally, any integrated approach to ocean governance could only deal with it either on a high abstraction level or by tapping into just a few of these issues. Some reflections based on how this dissertation has approached this topic will now be provided.

The dissertation has taken an anthropocentric position to management, noting that an socio-ecological and ecocentric position risks to be analytically impenetrable or unavailable for some research questions, such as those investigated by this dissertation (section 4.1). A governance issue for which section 4.1 has made strong delimitations compared with the high-level abstraction of many concepts is the actor perspective. Whereas “governance” embraces the multiple actors and stakeholders at multiple levels, this dissertation has focused on the state. In contrast, however, if I had generalized across the different ways in which nation states, NGOs, coastal communities, international organizations, or a directorate underlying a state could intervene against the problems and objectives of the ocean, it would have resulted in strong simplifications. A common management process could have been an appealing solution, at least to make the generalization possible.

Another way of approaching a governance issue is to specify which type of management or governance a research question or management issue deals with. The “travelling idea of the time,” process management, occupies much of the ocean governance space (Paper III), alongside an implicit focus on management structures (section 4.1.4). Yet, as per section 4.1.4 and Paper I, any management could be perceived as a process of multiple phases vested in a management structure. Moreover, any organizational structure of a certain size involves a risk of fragmentation, bad coordination, or a lack of interaction, all of which could be reduced by increased structural integration. In theory, these process phases and structural risks are no different if the matter is terrestrial or marine, or if the management unit is a public entity, an organization, or a company (section 4.1.4, Paper I). Certainly, these inherent structural risks and process aspects of generic or basic management are also relevant to ocean governance. In ocean governance, not only are these structural risks and process aspects emphasized, sometimes integrated concepts of ocean management focus only on some of them, such as adaptive ocean governance³⁰³ or (sectoral) coordination,³⁰⁴ without discussing why that specific aspect of management is emphasized at the expense of others, whether it poses a specific problem in ocean governance, or what the limits of such an argument are (e.g., what the limits to adaptation and coordination are).

³⁰³ Considered by some as the “single most important weapon in our armoury.” Santos et al, “Integrating Climate Change in Ocean Planning,” p. 9.

³⁰⁴ For example, Charles, “People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems,” p. 352 and Scott, “Integrated Oceans Management: A New Frontier in Marine Environmental Protection,” p. 467.

Moreover, a problem-based approach brings substance to ocean management processes and structures.³⁰⁵ It illuminates how those structures and processes only concern some more concrete aspects of the problems and objectives of the ocean. For example, as Paper III discusses and preceding the conclusions of section 7, efforts to protect the marine environment by responding to environmental pressures, providing access to resources, and providing for social distribution are primarily subject to different processes than those of (integrated) ocean management. This conclusion is suitable to show the limits of adaptability and coordination. Adapting or coordinating for the purpose of including these main efforts would include expanding the scope from (integrated) ocean management to, for example, the management of economic activities and social issues. This would entail redefining ocean governance as general governance, thus, it could hardly be subsumed as adaptation or coordination of ocean governance. Therefore, to capture the complexities entails elevating the abstraction level even higher. Yet, management and governance demand categories and partition, within which to structure efforts for societal objectives. Arguably, plural perspectives are needed, each would be limited, none would be comprehensive (or integrated), and the premises and contribution of each should be specified.

One way to advance the use of integrated approaches to ocean governance is to replace the belief in them as universally relevant by thinking of, and explicating, “concepts as experimental explanations rather than universals,”³⁰⁶ resting on premises and problem perceptions which should be transparently accounted for. With such a caveat, concepts (understood as experimental explanations) are more likely to be subject to well-deserved critique and relevance tests. Without such a caveat, concepts of ocean governance could suffer from a pretense-of-knowledge condition.³⁰⁷ Further, section 6.2 will present the advantage of a transparent problem analysis, which contrasts integrated concepts that rely on an unclear or intransparent problem perception or problem analysis.

6.1.3 Concepts as imagined-practiced reality

A question emerging in light of this critique is whether it persists if these concepts, rather than abstractions, are understood as an imagined–practiced reality “oscillating” between the imagined and the practiced worlds to perfect and improve concepts.³⁰⁸ Papers I and II have shown how these concepts are manifest both in theory and practice. If the oscillation perspective is applied to this dissertation, it could be seen as starting from Paper I, where one normative concept of IOM maintains

³⁰⁵ Similarly, “critiques of [marine spatial] planning argue that planning is a process seeking a substantive basis. Tim Stojanovic and Kira Gee, “Governance as a Framework to Theorise and Evaluate Marine Planning,” *Marine Policy* 120:104115 (2020), p. 10.

³⁰⁶ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 14. Somewhat similar to experimental explanations, with regard to the ecosystem approach De Lucia, “The ‘Ecosystem Approach’ in International Environmental Law: A Biopolitical Critique,” p. 475, finds that “there is no *true* or *essential* ‘ecosystem approach’, but only the contingent and contested results that emerge, in the different regimes ...”

³⁰⁷ Unlike, Patrício et al, “DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?” p. 2, “Conceptual models are needed to collate, visualize, understand and explain the issues and problems relating to actual or predicted situations and how they might be solved,” providing no caveats to this end.

³⁰⁸ Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, pp. 15–16 (reference omitted).

to contribute to protection of the marine environment. Then, it oscillates to the practiced IOM reality, in Paper II, showing how IOM only contributes to protection of the marine environment in a fragmented way. Then, it oscillates back to Paper III, which provides theoretical refinements in terms of the limited contribution of ocean management, deeming it ocean management rather than integrated ocean management. This inherent limitation, I argue, has been under communicated both in the imagined and the practiced reality. Thus, I argue that understood as an imagined–practiced reality, the oscillation between these worlds could have aggravated as much as perfected the concepts. By persistently highlighting an unfounded assumption (contributing to a broad set of objectives), it could easily be taken for granted. In any event, the critique related to the concepts’ capacity to respond to societal objectives and problems, and the intransparent premises, still apply when the concepts are understood as an imagined-practiced reality.

6.2 Protecting the marine environment

This dissertation has approached protecting the marine environment as a management objective. The focused investigation of this environmental objective, detached from the economic and social objectives, has offered the environmental objective a well-deserved focus. Relying on a problem-analysis, the approach has interrogated problem aspects and some implications for management including options available to certain management actors. The problem analysis and the main pressures provide a transparent account of the premises of the analysis. While it is challenging to frame and expose, it is immediately available to be critiqued in light of different perspectives, values, and new knowledge. It illustrates how a problem account is but an experimental contingent explanation. As such, it has an advantage over conceptualizations with intransparent problem analyses. This section now provides some reflections based on the approach of section 4.

6.2.1 Refine how we talk about environmental efforts and objectives

In light of the problem analysis, protecting the (marine) environment is a matter of managing the global processes of extracting “energy and material resources from the environment and transform them into goods and services”³⁰⁹ generating emissions and waste products to be absorbed or detoxified by the biosphere. Importantly, protecting the marine environment is a matter of reducing or mitigating environmental pressures, in contrast to (yet complemented by) the integration principle (sections 4.4 and 4.5, Paper II). I challenge whether one can even call it protection of the marine environment without addressing main problems or pressures (Papers II and III) such as climate change, marine pollution, and the increased demand for space. Take the example of a plan for increased activities in a marine area, which under the guidance of the integration principle, reduces some of the negative environmental consequences. Despite the reduction, it leads to increased physical occupation or disturbance of habitats, outtake of ecosystem components, emissions, or waste products. The environmental outcome is net negative (Paper II). Could this still be framed as protection of the marine environment, as an environmental objective, or even as conducted for environmental purposes? I argue none of them and suggest that we refine our language on how we name and label “environmental” efforts. Certainly, the net negative effects could be a result of balancing environmental against economic or social objectives. However, such trade-offs and, more

³⁰⁹ Burger et al, “The Macroecology of Sustainability,” p. 2.

generally, efforts that result in net negative outcomes on behalf of the environment should in a more transparent and true manner not be framed as an environmental effort but as an economic or social effort.

Another example is impact assessments, which could be envisioned for multiple purposes. An impact assessment could be a step on the way to facilitating economic activities, thus primarily stemming from an economic objective (section 4.3 and Paper III). It could also be motivated by the need for a status of the environment to illuminate environmental problems (Paper II). As per the macroecological perspective, the status of a confined marine area has limited relevance for environmental purposes. It could reveal local or regional pressures that need attention. Otherwise, an environmental function is the contribution to the aggregated global status (section 4.6 and Paper II). Therefore, one should consider carefully whether to frame impact assessment, which may lead to increased negative effects on the environment, as environmental. It bears the risk of misleading decision-makers and stakeholders that efforts are invested in protecting the marine environment, whereas the assessment may be used for multiple purposes not all environmental.

A final example is the human (social) right to participation. An environmental activist citizen or organization could improve conditions for the environment following some political influence they pose. However, in the hands of industrial organizations or actors, participation could lead to improved economic conditions at the expense of the environment. Thus, I suggest we consider if such efforts should rather be labelled social objectives.

6.2.2 The macroecological perspective and the global scale

Any coastal state has a particular interest in the status of the marine areas to which it has entitlements and rights to exploit resources. Yet, from an environmental perspective, this marine area depends on the marine areas at larger scale (sections 4.4–4.5). Whereas the macroecological perspective and the biospheric capacity constraints are increasingly known,³¹⁰ the relevance of the global problem scale for ocean management has sometimes escaped attention. For example, the global problem scale invalidates the assumptions that protecting the marine environment of a confined area primarily involves managing the marine activities in that area (Papers II and III).³¹¹

At an even larger scale, the global oceans could be perceived as the “marine region” of the planet. Except for the main “marine regional” pressure of overfishing, the remaining main pressures threaten

³¹⁰ Scholarly suggestions of regulating the capacity constraints include Edgar Fernández Fernández and Claire Malwé, “The Emergence of the ‘Planetary Boundaries’ Concept in International Environmental Law: A Proposal for a Framework Convention,” *Review of European, Comparative & International Environmental Law* 28, no. 1 (2019); Voigt, “The Principle of Sustainable Development: Integration and Ecological Integrity,” p. 153.

³¹¹ Such as, “Through the establishment of MPAs, the total pressures on marine ecosystems may be controlled,” Ingvild Ulrikke Jakobsen, “Marine Protected Areas and Climate Change,” in *The Law of the Sea and Climate Change: Solutions and Constraints*, eds. Elise Johansen, Ingvild Ulrikke Jakobsen, and Signe Busch (Cambridge: Cambridge University Press, 2020), p. 235.

the environment both on land and at sea (section 4.6). The importance of the global scale, including that the scales of impact and pressures only align globally, challenges a fundamental premise of this dissertation. The premise is the focus on protecting the global marine environment, unlike protecting the global (terrestrial and marine) environment. As per the macroecological perspective, protection of the global (terrestrial and marine) environment is an even more appropriate objective than the socially defined “natural” system³¹² of the global marine environment, which does not match the global processes that cause the pressures upon it. Nonetheless, protecting the marine environment was a predefined premise of this dissertation that relates to its investigation of the objectives of ocean management. In light of the macroecological perspective, protecting the marine environment is not necessarily a pertinent delimitation, as the ocean is intertwined with terrestrial parts of the planet, as that environment is subject to the global processes and global pressures, and as the impact and pressures on the global marine environment do not align in scale. Yet, in the problem analysis of Papers I and II, the suggested approach in face of this knot was to focus on the main pressures on the global marine environment.

Regardless, protecting the marine environment is pertinent as per UNCLOS, which imposes upon states to protect and preserve the marine environment.³¹³ This obligation concerns the marine environment as an object of protection, reflecting the scope of application of UNCLOS. The obligation is directed at all states, not just coastal states.³¹⁴ If the obligation is interpreted as per the mitigation approach, fulfilling this obligation would demand states to reduce environmental pressures beyond pollution (section 4.7) in their jurisdictional capacities with which they intervene with them. These include state capacities as territorial and citizen sovereignty, procurers, market states, investors, and as members of the international community.³¹⁵ By addressing those global pressures, the global terrestrial environment would also improve.

Based on Papers I and III, section 4.4 has argued how the scale of environmental problems (global processes and global pressures) is predominantly global. Yet, the intervention scale is still predominantly national, as states reside on the top of the formal legal global management hierarchy (section 4.1.2). The national intervention scale could accordingly rather be described as local than global. Thus, intervention and responses remains to be initiated and implemented locally. However, against which pressures states should respond and to which extent, should arguably depend on the main global environmental problems and the global environmental status at any time. Adding to this, regional and local pressures must also be attended to. Certainly, the diverging problem scale and intervention scale challenge environmental management and regulation.

³¹² Langlet, “Scale, Space and Delimitation in Marine Legal Governance – Perspectives from the Baltic Sea,” p. 279.

³¹³ UNCLOS, art. 192.

³¹⁴ As per the word “States” in the convention text.

³¹⁵ Somewhat similar, Boyle argues that land based pollution is included in the obligation to protect and preserve the marine environment, Boyle, “Protecting the Marine Environment from Climate Change: The LOSC Part XII Regime,” p. 87.

6.2.3 Target and design of environmental management and regulation

The problem analysis of sections 4.4 and 4.5 has suggested some targets in managing and regulating the marine environment (Paper II and III). In light of the problem analysis, protecting the (marine) environment is a matter of managing the global processes that extract “energy and material resources from the environment and transform them into goods and services,”³¹⁶ resulting in waste products and emissions to be absorbed or detoxified by the biosphere. States contribute to these processes by resource extraction and energy production, and the demand, import, production, export, and consumption of goods and services by citizens and public and private entities (section 4.4, Paper II). Therefore, environmental management and regulation is first and foremost a matter of managing and regulating humans and human activities (unlike an area).³¹⁷ This questions the relevance of ocean management, as discussed throughout this dissertation. An example to show how this could be confused will be provided from a to-be-adopted component of the EU Horizon Europe research program.

The proposed component “to restore our oceans and waters” states that governance must be revamped to “create an integrated and participatory EU-system of ocean and water governance.”³¹⁸ The first of two reasons provided to this end is that the “integrity of Europe’s entire water system ... cannot be managed by dividing it into parts or administratively disconnecting fresh waters from the seas and the ocean.”³¹⁹ This is an argument of ecological connection (as well as disconnection from the land). This dissertation has highlighted multiple reasons for why it is not appropriate to group management efforts around a geographically confined (environmental) object of protection (Papers II and III). The ocean and waters are primarily where the scale of impacts play out, unlike the scale of the processes, pressures, and activities causing them (which is what needs management). The pressures on the oceans and waters permeate primarily from the soil and from the air (as the Proposed Mission report also confirms).³²⁰ The fact that eutrophication, climate change, overfishing, and pollution all inflict on this water system does not entail that these pressures are appropriately co-managed, although it reflects that they should all be restricted. Arguments for co-management would be, for example, that they need similar responses or expertise, or careful adjustments to each other. Thus, the example shows how targeting a “connected” environmental entity does not justify that pressures inflicting on the areas are connected and that management efforts for their intervention are appropriately co-managed as ocean governance.

³¹⁶ Burger et al, “The Macroecology of Sustainability,” p. 2.

³¹⁷ Contrastingly, for example, Jans, “Stop the Integration Principle,” p. 1541, implicitly recognizes an “environmental field” and an “environmental sphere” as something existing besides other sectors (which the integration principle however traverses). Also contrastingly, Bodansky, *The Art and Craft of International Environmental Law*, p. 57 prescribing a cure on the premise of an imaginary international environmental with what he claims as “broad authority” over environmental problems.

³¹⁸ Lamy et al, “Proposed Mission: Mission Starfish 2030: Restore Our Ocean and Waters,” p. 46.

³¹⁹ *Ibid*, p. 44.

³²⁰ *Ibid*, pp. 4 and 9.

The second reason for making ocean governance a strategic priority for the EU is that “environmental, economic, geopolitical and strategic challenges concerning the ocean are too big for the EU to not deploy its full clout in its own interests.”³²¹ Yet, any of these environmental, economic, geopolitical and strategic challenges have marine and terrestrial aspects. Separating marine issues from their terrestrial counterparts (e.g., marine geopolitics from terrestrial geopolitics) immediately seems counterintuitive, demanding some analysis or arguments to this end. If the terrestrial and marine aspects are not to be separated, we are no longer discussing “ocean” governance but the general governance of economic, geopolitical and strategic challenges. The report pinpoints many important problems that has an ocean aspect. They must surely be targeted. Yet, that does not entail that the marine aspects of each of these problems are appropriately co-managed or that they should be disconnected from their terrestrial aspect. Rather, further analyses are required to this end. Thus, this dissertation finds that the suggestion to “create an integrated and participatory EU-system of ocean and water governance” that “should be steered by the highest level of leadership in the EU, the European Council, framed by an Integrated Ocean and Water Plan for Europe and supported by a new European Ocean and Water Agency” is practically unfounded.³²² This example illustrates how designing and structuring management efforts or regimes around a geographically confined area, unlike managing and regulating humans and human activities, is not necessarily appropriate for environmental objectives.

The approach of Paper II and in particular Paper III is to sketch what each of the main pressures individually would require of responses, unlike combined responses to all pressures. Paper III outlines the responses available to states in relation to each of these pressures. Thus, this dissertation only sketches responses to specific pressures, therefore not commencing on the challenge of investigating or envisioning combined responses to multiple (or all) pressures that look beyond, for example, emission points or specific activities to the underlying structures of how activities are conducted, by whom, and how humans trigger global processes.³²³ Combined responses that would alleviate multiple pressures are not often highlighted in ocean governance literature, whereas responses to single pressures are (Paper III).³²⁴ One plausible explanation is that these responses are perceived as

³²¹ Ibid, p. 44.

³²² Ibid, p. 44.

³²³ For example, by promoting, facilitating for, standardizing and harmonizing activities with low negative environmental negative effects, in combination with phasing out activities with high negative environmental effects; by redefining the values and priorities of public and private actors; or by increasing environmental education and literacy. On redefining the priorities of corporate actors, see Beate Sjøfjell, “Redefining Agency Theory to Internalize Environmental Product Externalities,” in *Preventing Environmental Damage from Products: An Analysis of the Policy and Regulatory Framework in Europe*, ed. Carl Dalhammar, Eléonore Maitre-Ekern, and Hans Christian Bugge (Cambridge: Cambridge University Press, 2018). On eco literacy, see Daniel Goleman, Zenobia Barlow, and Lisa Bennett, *Eco Literate: How Educators Are Cultivating Emotional, Social, and Ecological Intelligence*, (San Francisco: Jossey-Bass, 2012).

³²⁴ For example Santos et al, “Integrating Climate Change in Ocean Planning.”; Katsanevakis et al, “Ecosystem-Based Marine Spatial Management: Review of Concepts, Policies, Tools, and Critical Issues,” p. 817 that consider climate change and geohazard risks.

too far off from ocean governance, thus reflecting the message that protecting the marine environment is too.

One could question why climate change should be listed among those other main pressures. Some research and management focusing on climate change seem to imply that it is a “superior” problem or a problem in its own league.³²⁵ Against this, from the perspective of the global marine environment, the IPBES report rather concludes that overfishing is the main threat followed by land-/sea-use change as number two.³²⁶ Moreover, the main pressures of section 4.6 indicate that climate change is one of several important environmental problems (if we pretend away climate change, the marine environment still suffers from other main pressures). This invokes the questions of which (main) pressures to address, how to distribute focus and resources to confront them between the different pressures, and, if responses exist that target all or more pressures. The latter two questions are outside the scope of this dissertation.

6.2.4 Problem-framing the principles of international environmental law

Section 4 and the theme findings and reflections invoke some questions concerning the concepts or principles of international environmental law (principles of IEL). The central role of the principles of IEL is highlighted also in the context of ocean governance. For example, Singh and Jaeckel in “Future Prospects of Marine Environmental Governance” explain that “no regulatory or governance framework exist to address biodiversity protection from the various human activities on and in the oceans” and

there is consensus on the fact that the gaps need to be addressed with a science-based, precautionary approach, with environmental legal principles at the core of any answer.”³²⁷

Thus, these scholars perceive principles of IEL at the core of protection of the marine environment. The importance of the principles of IEL is further reflected in a current discussion on the need to codify some principles of IEL as a means to strengthen international environmental law. In 2017, a “global pact for the environment” was proposed by a group of experts, to affirm principles of IEL in a treaty-like manner.³²⁸ In response to this initiative, the UN Secretary-General issued a report of 2018 stating that “[i]nternational environmental law and its effective implementation could be strengthened through such actions as the clarification and reinforcement of principles of international

³²⁵ For example, Richard Stafford and Peter J. S. Jones, “Viewpoint – Ocean Plastic Pollution: A Convenient but Distracting Truth?” *Marine Policy* 103 (2019).

³²⁶ Díaz et al, “IPBES Summary for Policy Makers,” p. 12.

³²⁷ Singh and Jaeckel, “Future Prospects of Marine Environmental Governance,” p. 630 (references omitted).

³²⁸ Fabius Laurent et al., “White Paper: Toward a Global Pact for the Environment,” (Paris: Le Club des juristes, 2017). The draft is available at <https://globalpactenvironment.org/uploads/EN.pdf>

environmental law.”³²⁹ Some have highlighted the contradiction of “freezing” dynamic (if not experimental) concepts and principles³³⁰ or criticized them from different perspectives.³³¹

One lesson that section 6.1.2 offers is to think of and explicate “concepts as experimental explanations rather than universals”³³² that rest on premises and problem perceptions that should be transparently accounted for. A question triggered by the problem analysis is whether the principles of IEL, as experimental explanations, have kept pace with the evolving knowledge on the nature and scale of the global environmental problems as per the 2020s. For reasons of scope, some overall reflections in response to this question will be provided with respect to four principles.

As per the report of the UN Secretary-General, principles of IEL that may fill gaps between the rules laid out in treaties include

the duty of States to [1] prevent significant environmental harm beyond their national boundaries, [2] exercise precaution in making decisions which may harm the environment, [3] provide reparation for environmental harm, [4] provide public access to information and decision-making involving potentially significant environmental harm and cooperate in environmental protection.³³³

Now the question is, in light of the approach of section 4, whether each of these principles have kept pace with the evolving knowledge on the nature and scale of the global environmental problems.

[1] The no-harm principle imposes on states to ensure that activities within their jurisdiction or under their control do not cause (significant) harm to the environment of other states or to areas beyond national jurisdiction.³³⁴ The principle makes sense in cases where the harm can be located, such as harm resulting from an oil spill. As per section 4.4, the global processes, in aggregation, cause “harm” or pressure on the environment. The negative effects of multiple activities spread out some locally,

³²⁹ A/73/419 UN Secretary-General, “Gaps in International Environmental Law and Environment-Related Instruments: Towards a Global Pact for the Environment,” (2018).

³³⁰ Christina Voigt, “How a ‘Global Pact for the Environment’ Could Add Value to International Environmental Law,” *Review of European, comparative & international environmental law* 28, no. 1 (2019), p. 22.

³³¹ For example, Louis J. Kotzé, “International Environmental Law's Lack of Normative Ambition: An Opportunity for the Global Pact for the Environment?” *Journal for European Environmental & Planning Law* 16, no. 3 (2019).

³³² Davies, *Law Unlimited: Materialism, Pluralism and Legal Theory*, p. 14.

³³³ UN Secretary-General, “Gaps in International Environmental Law and Environment-Related Instruments: Towards a Global Pact for the Environment,” p. 42 (numbering inserted by the author). These four principles are reflected in the global pact arts. 5, 6, 7, and 9 respectively, however as explained in connection with repair [3], this phrase deviates from the formulations of the draft global pact.

³³⁴ For example, as expressed in UNCLOS, art. 194(2). See, Karen N. Scott, “International Law in the Anthropocene: Responding to the Geoengineering Challenge,” *Michigan Journal of International Law* 34, no. 2 (2012), p. 333.

some globally, and some are absorbed or detoxified without being traceable. Thus, they are not easily detected and assessed as harm. Thus, the condition of significant harm and assessing how to prevent it entail that the principle has limited relevance in light of the problem analysis of section 4.4.

[2] The precautionary approach comes in multiple versions and includes several aspects. Whereas precaution should certainly be exercised in future decision-making, it is perhaps time to complement or substitute an aspect of this approach. One aspect, regarded by Sands et al. as the core of the principle,³³⁵ is expressed in Principle 15 of the Rio Declaration that dates back to 1992. It states that “[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”³³⁶ As per the macroecological perspective, the global state of the environment should be the main point of reference for making decisions on environmental responses due to the global capacity constraints regarding the existence of resources and the detoxification and absorption capacity, and the global processes and pressures (section 4.4). The three scientific reports cited in the problem analysis all indicate the urgency of taking action. Does it make sense to discuss “reason to postpone measures” when the “urgent need to take action” clearly signals that we are beyond the state of precaution? Even if these three science-based reports come with some uncertainty, this aspect of the precautionary approach appears outdated in the 2020s. Until future scientific assessments find that the deterioration of the global (marine) environment has been restored at healthy levels, measures should continuously and increasingly be undertaken from a perspective of urgency rather than precaution.

[3] The report suggests repair as a relevant response.³³⁷ The relevance of repair depends on what is considered as the problem and if the problem is repairable. Certainly, environmental harm or damage could be envisioned that is repairable to some extent, such as the removal of a hazardous wreck. Repair requires that the damage or harm is – to some extent – reversible, controllable or could be compensated for. Such harm is always relevant to repair. Yet, as per the problem analysis of this dissertation, the main problem of the global environment is the global processes or the global main pressures on the environment. Immediately, repair does not emerge as a relevant response to global scale extraction of materials, energy use, waste and emissions that continuously induce pressures on the environment. Neither does each of the main pressures (fisheries, increased use of space, climate change, marine pollution, and non-native species) of the IPBES report and WOA1 (section 4.6) appear as repairable (unless repair in a wide sense is interpreted as mitigation). The question arises which problems the UN Secretary-General had in mind when suggesting repair for harm as a relevant response. The report does not say. This illustrates the challenge of implicit problem perceptions: we do not know how the problem was perceived. Moreover, the many arguments in favor of the Anthropocene (section 5.3.2) further imply that much of the harm to the stability of the boundaries

³³⁵ Sands et al, *Principles of International Environmental Law*, p. 230.

³³⁶ UNGA/CONF.151/26 (Vol. I) “Rio Declaration on Environment and Development.”

³³⁷ Unlike the draft “global pact” that suggests, in art. 5, to prevent environmental harm, and in art.7, to ensure an adequate remediation of environmental damages, Laurent et al., “White Paper: Toward a Global Pact for the Environment.” The terms “environmental harm” and “environmental damages” raise similar questions.

of the global environment is irreversible.³³⁸ Thus, it indicates that in many ways we are beyond the stage of repair.

[4] As discussed in sections 4.3 and 6.2.1, the environmental effect of public access to information and decision-making is limited; thus, we should consider redefining them as social objectives.

Thus, I conclude that three of the experimental explanations presented in the report should be carefully reconsidered with regard to their limited relevance in light of the nature, urgency and scale of the global environmental problems.³³⁹ The fourth should be considered redefined as a social objective. Further, the principles should be complemented with an experimental explanation that puts relevant responses to the main environmental problems or pressures into focus.

The way in which the problem analysis conflicts with these principles of IEL shows the value of expressing concepts as experimental explanations that rely on certain premises and problem perceptions. It would more immediately invite critique and relevance tests. One reflection in this regard is to what extent, perceived from a legal perspective, the capacity of concepts as experimental explanations is more easily overlooked. One example is the method of the draft “global pact,” which was to “to select the most commonly recognized principles, and the most commonly used formulation of these principles.”³⁴⁰ This approach focuses on these concepts’ recognition and use (that may reflect historical realities), unlike treating them as experimental explanations, which could invite an up-to-date problem analysis. Another example is Paper I. It is a concept study that focuses, among other things, on the degree of normativity associated with the concepts. The terminology frequently used in IEL often reflects a similar focus, which, unlike being presented as a concept, is presented as “soft” law, non-binding norms, or legal principles. On the one hand, this focus on the normativity of environmental concepts reflects, amongst others, an unsurprising tendency of legal scholars to (re)search for something similar to hard law. On the other hand, the tendency to perceive concepts as norms may, however, entail that concepts are somewhat timeless and therefore not easily associated with experimental explanations. Thus, arguing for normative force in concepts may blur the experimental nature of those concepts.³⁴¹ On a final note, the potential of IEL to look beyond the

³³⁸ For example, “the complexities of the Anthropocene elude ‘the possibility of ‘solving’ it,” De Lucia, “Rethinking the Encounter between Law and Nature in the Anthropocene: From Biopolitical Sovereignty to Wonder,” p. 338 (reference omitted).

³³⁹ Similarly, Kotzé, “International Environmental Law's Lack of Normative Ambition: An Opportunity for the Global Pact for the Environment?” p. 213, maintains that IEL is not sufficiently ambitious to confront the Anthropocene’s socio-ecological crisis.

³⁴⁰ Fabius, “White Paper: Toward a Global Pact for the Environment,” p. 38.

³⁴¹ Some are more nuanced. For example, Sands et al. emphasize how principles of IEL have each “emerged in the context of sharp differences of view as to what they mean in practice, and what they should mean,” Sands et al, *Principles of International Environmental Law*. p. 248. Voigt, how “any attempt to codify legal principles needs to take account of the necessity of dynamism, abstractness, indeterminacy and generality inherent in principles,” Voigt, “How a ‘Global Pact for the Environment’ Could Add Value to International Environmental Law,” p. 22.

normativity of concepts, is vast. For example, IEL could explore how to approach environmental objectives and problems, such as, how to regulate and intervene in global processes or (multiple) environmental pressures and their underlying causes beyond those outlined in this dissertation.

6.2.5 A note on sustainable development and conflicting objectives

The internationally recognized policy objective (or concept) of sustainable development embraces fundamental societal objectives often expressed as environmental, economic, and social objectives (section 1.1). Sustainable development could be regarded as providing no direction concerning how to balance these different objectives, thus the balancing is arbitrary or an empty exercise without direction.³⁴² Some argue that sustainable development seeks to reconcile the requirement of environmental protection and that of development.³⁴³ Others suggest soft and hard sustainability to separate between different priorities, whether the economic pillar being considered as the foundation for the well-being of society (soft) or the natural systems and processes being vital for human existence (hard).³⁴⁴

In light of this broader set of objectives, investigating one of them, as in this dissertation, is clearly an academic exercise. Yet, it attempts to illuminate what one objective would require (of ocean management) if we had one only this one objective in mind. Investigating one societal objective separate from others has unpacked perspectives that could otherwise have been missed as a result of implicit balancing of objectives (Papers II and III, section 4.3). Thus, investigating one objective has clarified what this objective demands. The reduction of environmental pressures that the problem analysis has argued for clearly conflicts with the economic objective, as interpreted in section 4.3 to facilitate existing and expanding activities. Any effort to minimize the environmental effects of activities, whether at national, regional or international level, and whether targeting emission points, specific pressures, demand or consumption, or targeting standardization of activities or redesigned economic models, would limit and restrict the way in which economic activities could be conducted.

Based on the problem analysis, an argument in support of hard sustainability is how the environment reflects global capacity constraints (section 4.4). Unlike the humanly designed economic systems that are capable of redesign,³⁴⁵ the environmental capacities are fixed. Within such environmental limits,

³⁴² “The Principle of Sustainable Development: Integration and Ecological Integrity,” pp. 149–52.

³⁴³ For example, Yoshifumi Tanaka, *A Dual Approach to Ocean Governance: The Cases of Zonal and Integrated Management in International Law of the Sea*, Ashgate International Law Series (Farnham, UK: Ashgate, 2008), p. 240.

³⁴⁴ For example, Wanfei Qiu and Peter J. S. Jones, “The Emerging Policy Landscape for Marine Spatial Planning in Europe,” *Marine Policy* 39 (2013), p. 183.

³⁴⁵ Examples of modelling economics paying attention to environmental constraints include doughnut economics, for example, Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist*; biosphere economics, for example, Anne-Sophie Crépin and Carl Folke, “The Economy, the Biosphere and Planetary Boundaries: Towards Biosphere Economics,” *International Review of Environmental and Resource Economics* 8, no. 1 (2015); environmental economics, for example Stephen Smith, *Environmental Economics: A Very Short Introduction* (Oxford: Oxford University Press, 2011); and ecological economics, for example,

economic activities will have an essential role in providing for many of the social needs of humans (section 4.3). These conflicting objectives trigger the question of how IOM could possibly serve a broad set of conflicting objectives, yet this dissertation only responds to if IOM contributes to one of them, which will now be concluded on.

Fritjof Capra, “A Conceptual Framework for Ecological Economics Based on Systemic Principles of Life,” *International Journal of Social Economics* 44, no. 6 (2017).

7 Conclusion on the Research Question

This section now revisits the overall research question, which concerns the potential of IOM to contribute to protection of the marine environment. First, this section presents the conclusions of each of the Papers. Then, it draws a main conclusion and explains its analytical generalizability. Thereafter, some reflections are offered on what IOM and ocean management can and cannot contribute to and what protection of the marine environment demands.

Paper I has identified two normative concepts. The first is the framing of integrated ocean management as a management process for the protection and sustainable use of the marine environment, relying on the ecosystem approach. The second is the incorporation of environmental, (and economic and social) concerns into an ocean management policy. In a final comment, Paper I problematizes whether the premises of IOM match the demands of protecting the marine environment.

Paper II finds that the case of IOM captures some environmental problem aspects (the impact and activities approaches) but that it captures the mitigation approach that long-term protection of the marine environment necessitates only in a fragmented way. As per the IMM plans, the main pressures on the Norwegian marine areas at large are those threatening the global marine environment. However, the plans target only some negative environmental effects of a selection of maritime activities, unlike targeting activities that contribute to the main pressures. Although “the plans facilitate some reduction of environmental harm or improvement of the environment from these selected activities, their overall contribution to the protection of the marine environment is limited, if not negative” (Paper II). As the IMM plans facilitate an increase in activities, they likely lead primarily to an increase in negative effects on the marine environment, compared with if the increased activities had not been facilitated. The environmental contribution is in any event limited or negative.

Paper II argues that it is not only the trade-off against other objectives that has led to the limited environmental contribution, but also the scope and approach of the plans. The IMM plans focus on impacts on the marine environment of the marine area to which Norway has entitlements, and activities present there, rather than focusing on how Norway could respond to the problems facing the marine environment. The integrated approach could be part of the reason why this aspect is unfocused. Bearing in mind that the IMM plans also capture economic and social objectives, the case could be that certain aspects are excluded or marginalized when the approach is holistic and broad. For example, as these pressures are global in scale, responding to them could implicitly be regarded as an international matter or a “terrestrial” matter relevant to policies other than those regarding marine management. Nonetheless, it remains to note that the plans ambitiously aim for long-term protection of the marine environment.³⁴⁶ Whereas the conclusion on the limited or negative

³⁴⁶ This is evident, for example, in the “vision to safeguard a clean and rich sea, so that future generations can continue to harvest the wealth of resources that the sea has to offer” and in that the “management plans are a tool to (...) maintain the ecological values in the ocean areas,” “Integrated Management Plan for the Norwegian Marine Areas. Report Nr. 20 to the Storting,” pp. 5 and 11 (author’s translation). Further, with

environmental contribution does not necessarily have a bearing on ocean management regimes of other countries, the Norwegian IOM regime has been applauded as best practice in its area,³⁴⁷ and the government's goal (at least in 2013) was "for Norway to be a pioneer in developing an integrated ecosystem-based management regime for marine areas."³⁴⁸ I suggest that it should be refined how the Norwegian approach illustrates ways of co-managing economic activities while reducing some negative environmental effects. If, however, protecting the marine environment is the prioritized objective, I would recommend a different approach.

Paper III concludes that the contribution of ocean management to reduce or mitigate the main environmental pressures is limited. Multiple relevant management efforts for this purpose fall outside the ocean management scope despite scholars maintaining how ocean management is relevant to mitigation and reduction of climate change and non-climate stressors and pressures.³⁴⁹ The reduction or mitigation of the main pressures is more appropriately organized by approaches that go beyond coastal communities, co-management of marine activities, or marine spaces. More appropriate approaches include those designed for the scale and characteristics of each pressure, those targeting markets, citizens, or structures beyond coastal communities and marine activities, or sectoral approaches. Further, Paper III concludes that ocean management is appropriate for area-based measures relevant to reducing the pressure of the "increased demand for marine space" and to reducing limited aspects of other main pressures. In any event, the potential of ocean management to protect the marine environment is limited.

Accordingly, despite Paper I concluding that IOM, as a norm, is for the protection of the marine environment, both from the perspective of Paper II, investigating a case of IOM, and the perspective of Paper III, investigating an illustrative IOM mandate, **the potential of (integrated) ocean management to contribute to protection of the marine environment is limited.** Whether the latter conclusion has bearing beyond these two analyses depends on the variant of IOM, the approach to protection of the marine environment, and the extent to which they align. In any event, the conclusion entails that preceding a claim that ocean management contributes to protection of the marine environment should be an experimental explanation (with transparent premises), perhaps resulting from a problem analysis, of how the ocean management mandate, instrument, or concept possibly responds to the environmental problems and approaches that protecting the marine environment

"Integrated Management Plan for the Marine Environment of the Norwegian Sea, First Update. Report to the Storting No. 35," the Norwegian government is "maintaining a long-term, integrated marine environmental policy that is intended to facilitate value creation and at the same time protect the marine and coastal environment," p. 5.

³⁴⁷ Ehler, "Pan-Arctic Marine Spatial Planning: An Idea Whose Time Has Come," in abstract; Hoel, "Integrated Oceans Management in the Arctic: Norway and Beyond," p. 188.

³⁴⁸ "Integrated Management of the Marine Environment of the North Sea and Skagerrak (Management Plan). Report to the Storting No. 37," p. 13.

³⁴⁹ Santos et al, "Integrating Climate Change in Ocean Planning," p. 4; similarly, Winther et al, "Integrated Ocean Management for a Sustainable Ocean Economy"; similarly, Scott, "Integrated Oceans Management and Climate Change."

demands. Otherwise, an unfounded claim that ocean management leads to ocean protection³⁵⁰ could be misleading.

A regulatory or management instrument or conceptualization of prioritizing to protect the (marine) environment should explore the problem space and plan for intervention in the main problems of the environment (whether understood as global processes, main pressures, or other approach). Then, economic and social concerns could be included into the planning. This approach differs from the integration principle, and could stand in direct conflict with economic and social objectives although it could reduce some negative economic or social effects. (Marine) environmental law and governance approaches could benefit from clarifying this conflict.

For example, the environmental problems of (over)fishing and increased demand for space stand in conflict with economic and social objectives promoting fisheries or exploring and exploiting new marine mineral resources. In this example, integrating environmental concerns, as per the integration principle, could result in certain environmental conditions on the fisheries or new marine activities, such as avoiding vulnerable areas. Yet, the integration principle would not allow for a (temporary) phase out of certain harmful fisheries combined with a policy to facilitate for the marine and terrestrial nutrients that provide for lowest possible environmental effects. Neither would it allow for banning exploring and exploiting for new marine mineral resources until the full potential of exploring and exploiting reuse of existing resources, for example, in waste, is exhausted. As evident in these examples, neither the integration principle nor ocean management is the appropriate “integrated” frame for addressing these matters.

IOM is often promoted as a means to take into account cumulative impacts or combined effects of marine activities on a marine area (section 3.1). Yet, in light of the macroecological perspective, and as explained in Papers II and III, the relevance of this focus is questionable. In the words of Gissi et al., studying the combined effects of climate change and other local stressors:

This study provides the first comprehensive review of the combined effects of CC [climate change] and other LS [local stressors] on different levels of biological organizations in the context of cumulative effect assessments in the marine realm. At large, we found that the current knowledge is still very patchy and incomplete, despite the recognition that research on multiple stressors combining CC [climate change] is critical for marine conservation.³⁵¹

It is of no surprise that current knowledge is patchy and incomplete, in light of the global processes and because their impacts on a geographically confined marine area are impossible to assess in full (sections 4.4-4.6). Efforts to assess the impact status of a confined area would in any event be subject

³⁵⁰ Such as “The importance of the oceans cannot be underestimated; thus, effective ocean governance is imperative.” Bianca Haas et al, “The Future of Ocean Governance,” *Reviews in Fish Biology and Fisheries* (2021), p. 2.

³⁵¹ Elena Gissi et al, “A Review of the Combined Effects of Climate Change and Other Local Human Stressors on the Marine Environment,” *Science of The Total Environment* 755: 142564 (2021), p. 10.

to premises limiting its relevance. Further, any marine activity has multiple negative environmental effects throughout the life cycle of the product or service they provide, in terms of physical disturbance, occupation or use of space, resource extraction, emissions and waste products. Some of these effects are traceable at sea, some at land, and some only traceable in aggregation (such as CO₂) if at all traceable. Combining effects from different marine activities would only capture some of these effects. While reasons to assess combined effects exist, the approach has inherent limitations, thus it is not comprehensive (or integrated), and its premises and purposes should be specified.

Rather than searching for traces of smoke in the marine habitats for environmental purposes, I suggest that some focus is shifted to the smoke before it leaves the chimneys. It does not disappear despite becoming invisible to the eye. It gets absorbed or is detoxified somewhere in the biosphere. Certainly, we need global impact statuses as well as local and regional impact statuses to know of any main local or regional pressures as a basis for deciding when to increase intervention and when to relieve it. Yet, current scientific reports to this end leave little sign of progress but keep indicating the urgency of taking actions against the threats of the marine environment.³⁵² Thus, shifting some of the focus to the chimneys, which do most harm, the activities they belong to, and the human demands or needs that these chimneys are linked to should be considered.

The question remains whether IOM and the similar concepts of ocean governance could advance to include the marginalized elements of protecting the marine environment. However, this is not the case, as this dissertation has shown that protection of the marine environment relies on global processes and the mitigation of main environmental pressures (sections 4.4–4.6 and 6.2.3) rather than the management of marine activities, coastal communities and coastal and marine areas (Paper III). The challenge remains how to design and implement combined responses to reduce all main pressures and how to orchestrate, within the global ecological capacity constraints, this reduction while attending to other societal needs.

³⁵² Knol further highlights the importance of a reflective approach to environmental management pointing to how “scientific knowledge gives prominence to a restricted agenda of defined uncertainties – ones that are tractable – leaving invisible a range of other uncertainties” Maaïke Knol, “Constructing Knowledge Gaps in Barents Sea Management,” *Maritime Studies* 9, no. 1 (2010), p. 76.

List of Abbreviations

CBD	Convention on Biological Diversity
CO ₂	Carbon dioxide
DPSIR	Drivers-Pressures-Status-Impact-Response
EBM	Ecosystem-based Management
EU	European Union
IEL	International Environmental Law
ICM	Integrated Coastal Management
ICZM	Integrated Coastal Zone Management
IMCM	Integrated and Sustainable Management of Coastal and Marine Areas
IMM plans	Integrated Marine Management Plans
IOM	Integrated Ocean Management
IPBES	Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
MSP	Marine/Maritime Spatial Planning
NGOs	Non-Governmental Organizations
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PM	Process Management
PME	Protecting the Marine Environment
SDG	Sustainable Development Goals
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNGA	United Nations General Assembly

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Appendices

Paper I

Schøning, Lena. "More or Less Integrated Ocean Management: Multiple Integrated Approaches and Two Norms" *Ocean Development and International Law*, 51(2), (2019): 95-115.

Paper II

Schøning, Lena. "The Contribution of Integrated Marine Policies to Marine Environmental Protection: The Case of Norway" *International Journal of Marine and Coastal Law* 36, no 2 (2021; *In press*), doi:10.1163/15718085-bja10048

The Contribution of Integrated Marine Policies to Marine Environmental Protection: The Case of Norway

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Abstract

This article investigates the contribution of the Norwegian integrated marine management (IMM) plans to marine environmental protection and conservation. These plans have been described as international best practice, and the government's goal is 'for Norway to be a pioneer in developing an integrated ecosystem-based management regime for marine areas'. The plans pursue other objectives, including sustainable use and value creation, but this article focuses on their contribution to environmental objectives. By means of a problem analysis, the article outlines three approaches to 'marine environmental protection and conservation' that contribute thereto in profoundly different ways. The contribution of the IMM plans to each of these approaches is examined, leading to the conclusion that two are embedded in the plans, which therefore primarily contribute to some reduced harm, as opposed to contributing to long-term marine environmental protection. This suggests that integrated marine plans and policies are relevant for more restricted environmental objectives.

Keywords

marine spatial planning – marine ecosystem governance – integrated ocean management – environmental management

Introduction¹

The Norwegian integrated management plans for the marine environment (IMM plans)² have been described as best practice,³ and the government's goal is 'for Norway to be a pioneer in developing an integrated ecosystem-based management regime for marine areas'.⁴ This article critically investigates the plans' contribution to marine environmental protection and conservation. Although the plans also pursue objectives other than marine environmental protection and conservation, such as sustainable use and value creation, the analysis here focuses on their contribution to the environmental objective.

The national integrated marine plan (or policy)⁵ is framed within a broader ecological and international governance context. The hypothesis, which is scrutinized in the problem framing section, is that not all environmental problems or challenges can be addressed within the framework of a national integrated marine management policy. Thus, three environmental

¹ This research was financed by the KG Jebsen Foundation and UiT The Arctic University of Norway. The author thanks the anonymous reviewers and editor for highly appreciated feedback and all my friendly colleagues for discussions and comments on earlier drafts. The responsibility for errors of fact or judgement remains with the author.

² Government of Norway, Ministry of Climate and Environment, *Helhetlige Forvaltningsplaner for de Norske Havområdene [Integrated Management Plans for the Norwegian Marine Areas]*, Report No. 20 to the Storting (2019–2020) (in Norwegian) [Norwegian IMM Plans] (also referred to as the 'most recent IMM plans' in this article) available at <https://www.regjeringen.no/no/dokumenter/meld.-st.-20-20192020/id2699370/?ch=1>. All websites accessed on 24 August 2020 unless otherwise mentioned. The management regime set out in the plans was first launched in the white paper *Protecting the Riches of the Seas*, Report No. 12 to the Storting (2001–2002), available at <https://www.regjeringen.no/en/dokumenter/report-no.-12-to-the-storting-2001-2002/id195387/>. The Norwegian government originally adopted three integrated marine management plans, reflecting a spatial division of the ocean into three areas. These are (1) *Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands*, Report No. 8 to the Storting (2005–2006) available at <https://www.regjeringen.no/en/dokumenter/Report-No-8-to-the-Storting-20052006/id456957/?q=Integrated%20management%20Barents> [Barents Sea IMM Plan]; (2) *Integrated Management of the Marine Environment of the Norwegian Sea*, Report No. 37 to the Storting (2008–2009) available at <https://www.regjeringen.no/en/dokumenter/report-no.-37-to-the-storting-2008-2009/id560159/> [Norwegian Sea IMM Plan]; and (3) *Integrated Management of the Marine Environment of the North Sea and Skagerrak (Management Plan)*, Report to the Storting No. 37 (2012–2013) available at <https://www.regjeringen.no/en/dokumenter/meld.-st.-37-2012-2013/id724746/> [North Sea IMM Plan]. Prior to the most recent IMM plans, the plans for the Barents Sea (twice) and Norwegian Sea were updated: *First Update of the Integrated Management Plan for the Marine Environment of the Barents Sea-Lofoten Area*, Report No. 10 to the Storting (2010–2011) available at <https://www.regjeringen.no/en/dokumenter/meld.-st.-10-20102011/id635591/>; *Update of the Integrated Management Plan for the Barents Sea-Lofoten Area Including an Update of the Delimitation of the Marginal Ice Zone*, Report to the Storting No. 20 (2014–2015) available at <https://www.regjeringen.no/en/dokumenter/meld.-st.-20-20142015/id2408321/>; and *Update of the Integrated Management Plan for the Norwegian Sea*, Report No. 35 to the Storting (2016–2017) (Update of the integrated management plan for the Norwegian Sea) available at <https://www.regjeringen.no/en/dokumenter/meld.-st.-35-20162017/id2547988/> [Norwegian Sea IMM Update]. The official versions of these documents are in Norwegian, but English translations exist, as concerns all plans but the most recent document (Norwegian IMM Plans). This article will refer to the English versions and the pagination of the English versions except for the most recent IMM plans, which refers to the Norwegian version and pagination.

³ CN Ehler, 'Pan-Arctic marine spatial planning: An Idea whose time has come,' in E Tedsen, S Cavalieri, and RA Kraemer (eds), *Arctic Marine Governance: Opportunities for Transatlantic Cooperation* (Springer, Berlin, 2014) 199–213, abstract; a H Hoel, 'Integrated Oceans Management in the Arctic: Norway and beyond' (2010) 1(2) *Arctic Review on Law and Politics* 186–206, at p. 188.

⁴ North Sea IMM Plan (n 2), at p. 13.

⁵ The IMM plans, although referred to as plans, bear strong characteristics of policy by including description of goals, extensive descriptions of activities and ecosystems, and briefly and generally referring to the measures (which are elaborated on or concretised in other relevant documents). The terms *policy* and *plan* overlap to some extent, which is why both terms are used here, with plan referring to one of the plans, and policy when the plans are discussed as an example of a national instrument for integrated marine management.

sub-objectives or approaches relevant for the protection of the marine environment taking a nation State (State) perspective are suggested and outlined. All three approaches are relevant and necessary for States desiring to protect, conserve, or preserve the marine environment. The approaches focus on different targets or objects of management:

1. The mitigation approach that targets the reduction of human pressures on the marine environment regardless of where the impacts occur.
2. The impact approach that targets the combined impact of pressures on a smaller area such as a spatially defined marine area of a State.
3. The activities approach that targets the reduction of certain environmental harm caused by a confined set of activities operating within a marine area of a State.

The approaches have different implications in terms of necessary knowledge, relevant scale, and consistent responses. Moreover, the potential contributions to long-term protection of the marine environment differ depending on the approach. The IMM plans do not openly discuss which environmental problem aspects are appropriately addressed within their mandate. Nonetheless, the plans ambitiously aim for long-term protection of the marine environment,⁶ which requires adherence to all three approaches. To analyse the contribution of the plans to this aim, some essential implications of each of the three approaches are set out. Then the plans are analysed by content analysis⁷ to see if these implications are embedded in the plans. The degree of embedment enables an assessment of whether the plans adhere to the three approaches, and consequently to which of the approaches the plans contribute.

The question now is to which extent the case of Norway is relevant beyond the Norwegian context. Integrated marine management policies⁸ are not specific to Norway, but are part of a broad international trend. According to the national reporting system of the Convention on Biological Diversity (CBD), more than 30 countries have arrangements that fall under the heading of ‘integrated ocean management’ and at least 66 are developing arrangements for this type of management.⁹ However, ‘integrated ocean management’ has no uniform meaning, and may conceal multiple definitions and practical variants. Focusing on integrative concepts relevant for ocean management that use the term ‘integrate’, two international standards and norms exist.¹⁰ The first is the integration norm set out in Article 6 of the CBD and subsequent COP Decisions, which calls for integration of environmental, economic and social concerns

⁶ Protecting the Riches of the Sea (n 2), at p. 7, for example, states the ‘vision to safeguard a clean and rich sea, so that future generations can continue to harvest the wealth of resources that the sea has to offer’. This phrase is reiterated in each of the management plans, for example, in the Norwegian Sea IMM Update (n 2), at p. 5, ‘maintaining a long-term, integrated marine environmental policy that is intended to facilitate value creation and at the same time protect the marine and coastal environment’.

⁷ K Boréus and G Bergström, *Analyzing Text and Discourse: Eight Approaches for the Social Sciences* (Sage, London, 2017), at p. 24.

⁸ On the terms ‘policy’ and ‘plan’, see (n 5).

⁹ These figures are derived from the analysis tool based on the national reporting system under the Convention on Biological Diversity (CBD) (Rio de Janeiro, 5 June 1992, in force 29 December 1993) 1760 *UNTS* 79. According to the tool (Question 154), 33 countries have arrangements in place for the integrated management of marine and coastal ecosystems, six (of which two are landlocked States) have no such arrangements, 47 States consider themselves at the early stages of development of such arrangements, and 19 States consider themselves at an advanced stage of development. The analysis was conducted in August 2018, and the tool is available at <https://www.cbd.int/reports/analyzer.shtml>.

¹⁰ L Schöning, ‘More or less integrated ocean management: Multiple integrated approaches and two norms’ (2019) 51(2) *Ocean Development and International Law* 95–115, at p. 2.

into cross-sectoral policies and plans.¹¹ Encompassing all these concerns, the IMM plans meet this norm. The second norm is based on a combination of the provisions in Agenda 21; the Protocol on Integrated Coastal Zone Management of the Barcelona Convention; CBD COP decisions, strategies and reports; and the integrated coastal management concept of PEMSEA.¹² This norm provides that integrated ocean management plans and policies comprise management processes, rely upon the ecosystem approach, and aim for the protection and sustainable use of the marine environment.¹³ The Norwegian IMM plans also meet these criteria.

Despite the adherence to these international norms and standards bolstering the general relevance of the case of Norway, the plans are but a piece of a larger Norwegian context that may be more or less representative in comparison to other States. Nonetheless, the three approaches investigated here are general and have little bearing on country-specific factors. Moreover, although the jurisdictional powers vested in States to meet the environmental challenges are equal,¹⁴ the priorities and available resources may vary from State to State. Regardless, the scope of an integrated marine management policy will necessarily reflect a self-imposed restriction of these jurisdictional powers.¹⁵ These restrictions reflect how a State organises and delegates its affairs and the approach it applies. For example, Scott highlights that only Norway includes fisheries in its ocean management plans.¹⁶ Further, the IMM plans reflect the marine industrial interests (petroleum, marine food production, shipping, tourism,

¹¹ See, for example, CBD, COP Decision VII/II Ecosystem Approach, Doc UNEP/CBD/COP/DEC/VII/11, 13 April 2004, Annex 1, para 3, and Principle 5, at p. 12, available at <https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-11-en.pdf>; CBD, COP Decision IX/8 Review of implementation of goals 2 and 3 of the Strategic Plan, Doc UNEP/CBD/COP/DEC/IX/8, 9 October 2008, para 8(c) available at <https://www.cbd.int/doc/decisions/cop-09/cop-09-dec-08-en.pdf>; Schøning (n 10), at p. 12.

¹² United Nations Conference on Environment and Development (UNCED), *Agenda 21: Programme of Action for Sustainable Development*, UN Doc A/CONF.151/26/Rev.1 (Vol. I) (12 August 1992), Annex II; Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona, 16 February 1976, amended 10 June 1995, in force 24 March 2011) 1858 *UNTS* 402. Relevant CBD COP decisions, strategies and reports include COP Decision VII/5 Marine and coastal biological diversity, Doc UNEP/CBD/COP/DEC/VII/5, 13 April 2004, Annex 1: Elaborated Programme of Work on Marine and Coastal Biological Diversity, which adopts IMCAM in the first programme element, available at <https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-05-en.pdf>; COP Decision VIII/22 Marine and coastal biological diversity: enhancing the implementation of integrated marine and coastal area management, Doc UNEP/CBD/COP/DEC/VIII/22, 15 June 2006, available at <https://www.cbd.int/doc/decisions/cop-08/cop-08-dec-22-en.pdf>; Action Plan for the Sustainable Ocean Initiative (2015-2020), available at www.cbd.int/doc/meetings/mar/soiom-2014-02/official/soiom-2014-02-actionplan-en.pdf; AIDEnvironment, National Institute for Coastal and Marine Management/Rijksinstituut voor Kust en Zee (RIKZ), Coastal Zone Management Centre, The Netherlands, *Integrated Marine and Coastal Area Management (IMCAM) Approaches for Implementing the Convention on Biological Diversity*, CBD Technical Series No. 14 (Secretariat of the Convention on Biological Diversity, Montreal, 2004) available at www.cbd.int/doc/meetings/mar/imcam-01/other/imcam-01-cbd-ts-14-en.pdf; Secretariat of the Convention on Biological Diversity, *Integrated Coastal Management for the Achievement of the Aichi Biodiversity Targets: Practical Guidance for Implementation Based on Experience and Lessons Learned from Coastal and Ocean Governance in the Seas of East Asia*, CBD Technical Series No. 76 (2015) available at <https://www.cbd.int/doc/publications/cbd-ts-76-en.pdf>. The Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) integrated coastal management (ICM) concept is set out in the ICM Code: Integrated Coastal Management (ICM) Code (PEMSEA, Quezon City, 2015) available at www.pemsea.org/our-work/integrated-coastal-management/ICM-code.

¹³ Schøning (n 10), at p. 8.

¹⁴ Yet, the international and regional obligations undertaken by each State may vary.

¹⁵ Schøning (n 10), at p. 4.

¹⁶ KN Scott, 'Integrated oceans management: A new frontier in marine environmental protection,' in Donald R Rothwell *et al.* (eds), *Oxford Handbook of the Law of the Sea* (Oxford University Press, Oxford, 2015) 463–490, at p. 471. However, the IMM plans adopted after Scott's article was published include fisheries in a more generally framed category of marine food production (see for example, Norwegian IMM Plans (n 2), at p. 68).

and emerging marine industries) of Norway, as well as environmental interests.¹⁷ Moreover, applying these approaches will expose the scope of activities included in the plans. Nevertheless, the case of Norway illustrates how distinguishing between different environmental sub-objectives or problem aspects facilitates the investigation, structuring, and evaluation of contributions to marine environment protection and conservation.

Problem Framing

The problem analysis introduces a macroecological perspective, as per Burger *et al.*,¹⁸ before focusing on the national ecological and governance context. The macroecological perspective is a global perspective of the entirety of Earth's environment and human interference therewith. It shows how human economies 'extract energy and material resources from the environment and transform them into goods and services'¹⁹ (the process). The production of energy and exploitation of resources, the transformation into goods and services, and the consumption thereof occur at a global scale, as resources, production facilities and end consumers often reside on different continents, thereby adding transportation to the process. Further, Burger *et al.* note how human economies in the process 'create waste products that are released back into the environment'.²⁰

Can the Earth support even current levels of human resource use and waste production? ... The emphasis on local and regional scales ... is largely irrelevant if the human demand for essential energy and materials exceeds the capacity of the biosphere to absorb or detoxify these substances.²¹

Multiple scientific reports find that the state of the global ocean environment (constituting roughly 70 per cent of the Earth's surface) is alarming.²² The macroecological perspective therefore challenges the relevance of local and regional scales, and hence the national scale, in light of the biosphere's limited capacity.²³ To add to the complexity, whereas the environmental effects of these processes are largely known, impacts may be spread out globally, and may only be detected on an aggregated level (such as CO₂). This implies that detecting all the processes that have had impact on the ecology of a confined area is impossible. How nation States should approach the protection of the marine environment in light of the

¹⁷ Norwegian IMM Plans (n 2), at pp. 67 and 18 respectively.

¹⁸ JR Burger *et al.*, 'The Macroecology of Sustainability' (2012) 10(6) *PLoS Biology* e1001345.

¹⁹ *Ibid.*, at p. 2.

²⁰ *Ibid.*

²¹ *Ibid.*, at p. 4.

²² Group of Experts of the Regular Process, *The First Global Integrated Marine Assessment, World Ocean Assessment 1* (United Nations, 2016) [WOA1]; Intergovernmental Panel on Climate Change (IPCC), '2019: Summary for policymakers', in H-O Pörtner *et al.* (eds), *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (IPCC, in press); Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *The Global Assessment Report on Biodiversity and Ecosystem Services: Summary for Policymakers* (IPBES Secretariat, Bonn, 2019).

²³ The limited biosphere capacity is also reflected in research on planetary boundaries. See J Rockström *et al.*, 'Planetary boundaries: Exploring the safe operating space for humanity' (2009) 14(2) *Ecology and Society* 32; W Steffen *et al.*, 'Planetary boundaries: Guiding human development on a changing planet' (2015) 347(6223) *Science* 1259855. Further, this is evident in the IMM plans. For example, in the Norwegian Sea IMM Plan (n 2), Chapter 3.3.1 identifies the main source of long-range pollutants transported by air and ocean currents, and the Norwegian IMM Plan (n 2), at p. 58, holds that 'Norwegian marine areas are part of a connected ocean system, and what happens in other parts of the world's oceans also influences Norwegian marine areas. The development of Norwegian ocean management must build upon an understanding of how climate change and other large-scale changes influence and will change the oceans of the world' (author's translation).

macroecological perspective, where both human pressures and their effects play out at global scale, is not immediately clear. Therefore, it is suggested that management instruments and scholarly literature focusing on the protection of the (marine) environment reveal their understanding of the greater problem complex and link efforts to aspects of it that they address. This article serves as an attempt at such problem framing.

Although Burger *et al.* question the relevance of confined scales from a macroecological perspective, the national scale is certainly relevant for governance or management purposes. Within the global governance system, States are the actor with designated formal powers (jurisdictional capacities) over humans and their activities²⁴ that are relevant for addressing global processes from a macroecological perspective. Moreover, the United Nations Convention on the Law of the Sea requires States to protect and preserve the global marine environment.²⁵ Certainly coastal States have a particular interest in their 'own' marine areas, where they have extended entitlements, which serve as an important source of resources.²⁶ However, in light of global biospheric constraints, if global pressures are not relieved, long-term protection of the environment cannot be achieved at any scale.

Despite the powers and obligations vested in States, the potential contribution of any nationally-scaled environmental efforts arguably can be questioned. How can national efforts respond to global processes ranging from resources and energy to waste? Several approaches can be envisioned. Each sovereign State contributes to a proportion of the global pressures by national resource extraction and energy production, as well as by demand, import, production, export, and consumption of goods and services by its citizens and entities. Reducing this proportion, or the environmental effects of these activities or pressures, contributes to global environmental protection. Alternatively and additionally, an individual State can reduce concentrations of detectable pressures on a local area, if these pressures are under the jurisdiction of that State. A State can, for example, restrict resource-exploiting activities operating in a marine area in order to protect fragile ecosystems or to implement their duty to integrate environmental concerns into decision-making concerning those activities (the integration principle).²⁷ However, these activities may not constitute the main threat to the area. Finally, States can monitor impacts of pressures in local areas to assess status trends.

What is the potential environmental contribution of an integrated marine management policy of a State in the face of the complexity of this ecological and governance problem? The policy likely only addresses some aspects of the problem. Hence, in light of the problem complexity outlined above, the contribution to marine environmental protection of any State's integrated marine policy, including the Norwegian IMM plans, is limited. Moreover, the scope of an integrated marine policy likely covers only some of a State's range of environmental efforts. As most human activities have a direct or indirect effect on the environment, management efforts that may be deemed relevant for marine environmental protection may be spread across multiple regulatory and management instruments in the national system into which an integrated ocean management policy is embedded. This complexity demonstrates the appropriateness of a holistic account of the management efforts, such as an integrated ocean

²⁴ I Brownlie, *Principles of Public International Law*, 7th ed. (Oxford University Press, Oxford, 2008), at p. 289; United Nations Convention of the Law of the Sea (Montego Bay, 10 December 1982, in force 16 November 1994), 1833 *UNTS* 396 [LOSC], Articles 2 and 56, which define the sovereign and jurisdictional rights of the State, and Article 193, which recognises the sovereign right of States to exploit their natural resources.

²⁵ LOSC, *ibid.*, Article 192, which imposes a general obligation on States to protect and preserve the marine environment.

²⁶ *Ibid.*, Article 2, which provides a coastal State sovereignty over the territorial sea, and Article 56, which provides sovereign rights to living and non-living resources in the exclusive economic zone, as well as limited jurisdictional rights.

²⁷ CBD (n 9), Article 6(b); see also Schøning (n 10), at pp. 8–12.

management policy, to synthesise and combine the most relevant efforts. This analysis attempts to assist such instruments by bringing forward some important problem aspects and relevant approaches. Still, the complexity of national regulatory and management systems limits the relevance of the analysis of a single instrument. Yet, as the plans ‘clarify the overall framework ... for management of Norway’s sea areas,’²⁸ this limitation does not outweigh the benefits of aligning this overall framework with certain aspects of the problem. In any case, global ecological and governance complexity bolsters the need to unwrap problem aspects of marine environmental protection. Three of these and how States may approach them are discussed below.

Three Approaches to Marine Environmental Protection

The Mitigation Approach: Reducing Pressures

The mitigation approach targets the reduction or mitigation of human pressures on or threats to the marine environment regardless of where the impact occurs. Multiple scientific reports on the status of the global marine environment indicate the urgency of addressing human threats to the ocean,²⁹ and call for a reduction or mitigation of these pressures.³⁰ The mitigation approach faces the challenge of alleviating intolerable pressure on ecosystems caused by humans. It differs from approaches targeting the impacts on ecosystem as it focuses on the human pressures. Although the pressures and their impacts certainly are related, for some management purposes it may be relevant to separate them. Managing pressures allows for targeting, for example, of the main or fundamental pressures, in light of the macroecological perspective, or root causes thereof, as well as the pressures whose effects are spread out globally.

This approach targets all relevant pressures, not just climate change, although the concept of mitigation is frequently referred to in climate change law and management.³¹ This prompts the question: What are the relevant pressures beyond climate change? For States aiming to mitigate the pressures, understanding the main or fundamental pressures, or the pressures that need to be reduced, is vital *knowledge*. Further, the State perspective of the analysis begs the question of what the relevant *scale* is. In light of the problem framing, the scale of human interference with the environment is global.

The governance system’s vesting of formal power in 200 sovereign States prompts the question of whether it is a responsibility of States, such as Norway, to protect the global marine environment, and whether it appropriate for a single State such as Norway to consider threats to the global marine environment in the management of its ‘own’ marine areas. States are obliged to protect the global marine environment.³² Any marine area depends on protection at

²⁸ Norwegian IMM Plans (n 2), at p. 5; Norwegian Sea IMM Update (n 2), at p. 5.

²⁹ See WOA1, IPPC, and IPBES (n 22).

³⁰ Mitigation is used in the meaning ‘the act of decreasing or reducing something, or hinder or prevent something’, as per the American Heritage Dictionary of the English Language (Fifth Edition, Houghton Mifflin Harcourt Publishing Company, 2016). The IPCC uses mitigation in a similar fashion, defining mitigation of climate change as ‘a human intervention to reduce emissions or enhance the sinks of greenhouse gases’ (IPCC (n 2), Annex I at p. 692). In contrast, the United Kingdom Marine Monitoring and Assessment Strategy (UKMMAS) defines mitigation more narrowly, as something not capturing preventative measures (which would also reduce pressures), but as those controls that aim to reduce the impact of a change if it does occur (UKMMAS, ‘Marine online assessment tool, Cumulative effects of human activities’ available at <https://moat.cefas.co.uk/uses-of-the-marine-environment/cumulative-effects-of-human-activities/>).

³¹ However, only some entities define the term, for example, the IPCC (n 22), Annex 1, at p. 692: ‘Mitigation (of climate change) [means] a human intervention to reduce emissions or enhance the sinks of greenhouse gases (GHG)’.

³² LOSC (n 24), Article 192.

all scales, including global, regional, and local.³³ Furthermore, migrating species and ocean currents call for attention on a large scale if the aim is marine environmental protection, in spite of confined mandates. Thus, protection of the global marine environment is not just an obligation for States, but also an appropriate perspective in protecting and conserving the environment of a State's 'own' marine areas.

Each State contributes a proportion of the global pressures, which potentially can be reduced, even though each State cannot solve the problem alone. Thus, a pertinent management scale for a State is its contribution to the pressures and its jurisdictional capacities and roles providing opportunities to reduce them. These jurisdictional capacities include territorial and jurisdictional rights in a spatially confined area; authority over national citizens and activities; flag, port and market State capacities; and their role as a member of the international community.³⁴ Multiple *management responses* can be anticipated, such as reducing the environmental effects of national resource extraction and energy production, by management of demand, import, production, export, and consumption of goods and services by national citizens and entities.

The Impact Approach: Impact on a Limited Area

In contrast to the mitigation approach, the impact approach *targets* the impact of pressures, meaning pressures as determined by impacts on a certain area. This approach captures pressures that have detectable or assessable impact in a defined area or have an impact on certain species or ecosystem components. The relevant area could be a spatially defined marine area of a State. Each habitat may respond uniquely to each pressure since global pressures play out differently in different areas. Depending on the characteristics of ecosystems and concentrations of pressures,³⁵ ecosystems may be more or less vulnerable or robust to pressures. Even though the global pressures on the marine environment need to be reduced generally, the impact capacity of a specific area may vary, meaning that some areas tolerate pressure better than others.

The impact approach provides for assessing the status or impact capacity of ecosystems in terms of, for example, environmental status, vulnerable or robust habitats, species, ecosystems, or areas. The relevant *scale* depends on how effects play out in marine ecosystems, natural systems and on single species, the extent to which this is possible to assess, and the choice of scale. If the impact capacity is expressed as an environmental status, that status may depend on the choice of scale. For example, whereas the environmental status of the three Norwegian ocean areas vary (the Barents Sea is considered as good, the Norwegian Sea as good with a few exceptions, and the North Sea and Skagerrak as 'concerning and in some areas unsatisfactory'),³⁶ the status of the ocean areas combined are presented as 'in many respects good, but increasingly influenced by climate change'.³⁷

³³ As explained in the problem-framing section above.

³⁴ BS Halpern *et al.*, 'Managing for cumulative impacts in ecosystem-based management through ocean zoning' (2008) 51(3) *Ocean & Coastal Management* 203–211, at p. 209 refers to the relevance of jurisdiction in relation to scale, but by referring to jurisdictional boundaries, the jurisdictional capacities that are not spatially confined are left out.

³⁵ BS Halpern *et al.*, 'Evaluating and ranking the vulnerability of global marine ecosystems to anthropogenic threats' (2007) 21(5) *Conservation Biology* 1301–1315, at p. 1302.

³⁶ Environmental status of Barents Sea and Norwegian Sea, Norwegian IMM Plans (n 2), pp. 19 and 33, respectively. The status for the North Sea and Skagerrak was last described in general terms in the North Sea IMM Plan (n 2), at p. 19. The approach to environmental status as applied in the IMM plans is a Norwegian policy concept.

³⁷ Norwegian IMM Plans (n 2), at p. 18; see also the official environmental status pages of the Norwegian Environment Agency, available at <https://miljostatus.miljodirektoratet.no/tema/hav-og-kyst/>.

The *knowledge* required by the impact approach includes an overview of marine ecosystems in order to establish categories that enable managers to prioritise areas or to take any relevant measures to protect ecosystem components. Examples of these categories can be environmental status or vulnerable or robust areas or components. The establishment of categories requires knowledge both of the ecosystem as such and the cumulative pressures thereon, to the extent that such knowledge is possible to obtain. Generally, ecosystems are subject to multiple pressures, but while assessing which exact pressure an impact stems from is easy in some instances, in most it is challenging, if not impossible.³⁸ Any categorising or assessing of an impact on an area therefore always comes with some uncertainty. Using vulnerability or robustness as the criterion for categorising knowledge has implications for the burden of proof. Determining which natural systems are robust enough to tolerate a certain level of activity (for example, the existing level of activity or an expansion into new activities) requires knowledge indicating the robustness of that natural system. Determining which natural systems are vulnerable to activities calls for knowledge indicating the vulnerability of the natural system. Therefore, the choice of perspective may influence the categorisation of the status of an area, whether robust or vulnerable, given the uncertainty attached to establishing links between activities and their impacts.³⁹

In any event, some activities located in a designated area will fall under the authority of the management regime. Thus, for impact management purposes, one could focus on specific activities with traceable or assessable impact on the area or on components of the area. In light of the uncertainty attached to these assessments, no obvious *management response* exists, except restricting those specific activities with a traceable or likely impact on a vulnerable ecosystem or species, or relocating those activities to robust areas. Thus, the concentration of specific activities may be redistributed or reduced, even though these manageable pressures may not be the most harmful pressures on the ecosystems in question. In light of the uncertainty attached to categorisation and assessment of marine areas, any management response relying on categories or assessments of impacts or status should do so with (pre)caution.⁴⁰

The Activities Approach: Reducing Some Effects of Certain Activities

Unlike the mitigation and impact approaches, the starting point and the *target* of the activities approach are multiple activities operating within a geographically confined area (not environmental pressures or impacts). This approach facilitates the avoidance of the effects of certain individual or combined activities in that area on, for example, particular species or habitats. The set of activities included may be those activities occurring in a spatially defined area.

It is worth noting, however, that this approach primarily facilitates activities, which always results in some negative environmental effects. Secondly, it seeks to reduce some of those effects. In total, this means that an activities approach most likely increases negative environmental effects simply by increasing activities. Therefore, the activities approach has a net negative effect on the environment. Yet, reducing environmental harm in the context of an

³⁸ 'It is of course difficult, if not impossible, to experimentally control for all possible ecosystem drivers, and so we are left to make inferences from studies that examine one to at most a few threats'. Halpern *et al.* (2008) (n 34), at p. 208.

³⁹ In the context of the impact approach, the focus here is on (semantic) categories, not ecologically determined categories. The reason for this is a general hesitance to assume that one can deduce how management should respond on the basis of ecological knowledge of a small area in light of the macroecological perspective presented in the introduction above.

⁴⁰ N De Sadeleer, 'The risk of risk analysis' (2017) 8(1) *European Journal of Risk Regulation* 28–32, at p. 29, argues how 'the precautionary principle and the principles of scientific rigour are not antithetical, but rather mutually reinforcing'.

activities approach is certainly relevant. Including environmental concerns under this approach would further reflect the integration principle—while planning for activities, environmental concerns must be taken into account.⁴¹ The activities approach may coincide with other purposes of coordination, such as co-existence and distribution of spatial areas to maximise resource use and outtake. When taking an activities approach, the *scale* of selected activities and their selected effects can be adjusted to match, for example, an area where certain activities occur, that is, a spatially defined area within the administrative or jurisdictional boundaries a State that coincides with the scope of a marine management regime.

For States taking an activities approach, the optimal *knowledge* input would be the effect of those activities that have a detectable or assessable impact on the ecosystems within the confined area of the selected activities (however, assessing the impact that stems from a particular activity is easy in some instances, but challenging if not impossible in most).⁴² Excluded from the approach are pressures from the selected activities that have effects outside the area (which may be subject to different management regimes), and effects on the area by activities outside the scope of the approach.

Moreover, some effects may be deselected as inappropriate with regard to aggregation level. For instance, the detectable or assessable impact of petroleum production in a given ocean area include extraction of a non-renewable resource from the seabed; damage to the seabed; the disturbance caused by pipeline structures and platforms; exhaust and pollution from platforms, supply vessels, oil service industries and helicopters; and physical occupancy by coastal landing facilities. These impacts are more or less appropriate to target within the activity's context. If abating climate change is a concern, targeting the exhaust of single platforms is likely an inappropriately low level to regulate unless it forms part of an overall plan targeting energy source composition, energy consumption of a State, or energy produced or used by an industry. Seabed damage and pipelines may, however, be appropriately targeted alongside seabed damage caused by bottom trawling. *Management responses* should therefore target the reduction of environmental effects that are appropriately addressed within the confined scope and scale of the activities approach.

It should be noted that the activities approach separates knowledge input from management responses. This means that the 'measure' of obtaining knowledge is not a management response. This is a narrower interpretation than use of the term 'measure' in the IMM plans. As noted by Sander, knowledge gathering is by far the most frequent measure identified in the former IMM plan for the Barents Sea.⁴³ Yet, as recognised in the 2019 report on the scientific basis to the IMM plan for Norwegian marine areas,

increased knowledge related to mapping and monitoring does not always lead to an improved understanding of the status of the respective ecosystems. Neither is it immediately evident how increased knowledge can or should be used in the management of the ocean areas.⁴⁴

Thus, management responses under the activities approach do not encompass knowledge gathering.

⁴¹ CBD (n 9), Article 6(b).

⁴² Halpern *et al.* (2008) (n 34).

⁴³ G Sander, 'Against all odds? Implementing a policy for ecosystem-based management of the Barents Sea' (2018) 157 *Ocean & Coastal Management* 111–123, at pp. 116–117, investigating the Barents Sea and Lofoten IMM.

⁴⁴ Professional Forum for Norwegian Sea Areas, *Sammendrag av det faglige grunnlaget for revisjon og oppdatering av forvaltningsplanene for havområdene*, [Summary of the scientific bases for revision and update of the management plans for the marine areas], Report No. M-1350 (2019), at p. 46 (author's translation), available at <https://tema.miljodirektoratet.no/no/Havforum/Forside/Publikasjoner/publikasjoner-fra-Faglig-forum/>.

Compiling and Contrasting the Three Approaches

The mitigation, impact and activities approaches call for a different scale, knowledge input, and management response tailored to each of their targets. Whereas all three approaches contribute to improvement of the marine environment, their potential contributions or achievements differ. As it targets the main threats to the environment, the mitigation approach, when applied by a majority of States, may lead to long-term protection and conservation of the marine environment. The other two approaches may contribute to a relatively improved environment compared to where they are not applied. Even if applied systematically by a majority of States, the impact and activities approaches would not lead to long-term protection and conservation of the marine environment as they only capture a selection of pressures—a selection that does not capture fundamental, main or necessary pressures, but those relevant for a more limited purpose. Therefore, regardless of the harm reduction or environmental improvement, the impact and activities approaches are not designed to abate the fundamental threats to the environment; accordingly, they will not lead to long-term protection and conservation of the marine environment. Table 1 outlines the three approaches and some of their diverging implications.

TABLE 1 Comparison of the three approaches to marine environmental protection

Approach	Target	Scale of target	Knowledge required (ideally)	Management response	Contribution
Mitigation	Pressures	Global Additional regional or local pressures in some areas	Main pressures and how to abate them	Reduce pressures	Long-term protection and conservation of the global marine environment
Impact	Impacts of pressures	Spatially limited area	Impact capacity of area, including ecosystems, natural systems, or single species	Locating, relocating, or restricting local manageable pressures	Reduce some environmental harm
Activities	Certain effects of certain activities	Certain activities, for example, operating in a spatially confined area	Combined effects of certain activities on certain ecosystems	Locating, relocating, or restricting activities	Certain local harmful effects are reduced

Some other environmental problem aspects fall beyond the scope of the three approaches, such as the clean-up of pollution and accumulated waste; the management of acute pollution risks; and some alternative measures to mitigation.⁴⁵ Thus, the three approaches do not constitute a comprehensive system of management for marine environmental protection, but rather a set of complementary approaches. The mitigation approach is arguably fundamental and a generic approach to the most important problem aspect of (marine) environmental

⁴⁵ The alternatives to reducing pressures include measures that absorb or transform some portion of a pressure, for example, carbon capture and storage, kelp aquaculture and ocean iron fertilization.

protection. In contrast, the impact and activities approaches are tailored to the State-level marine management context. Thus, the three approaches are not intended to have universal relevance for marine ecosystem management. They are tailored to a specific research question and management context.

The three approaches are related and indivisible in some ways. Whether positive or negative, impact trends (outputs of the impact approach) may feed into the discussion of relevant management responses under the activities approach. Further, the reduction of pressures (management response under the mitigation approach), expressed for example in terms of which activities States should consider, could be relevant for deciding tolerated activities that are a premise for the activities approach. Furthermore, the impact and activities approaches mirror each other in terms of management response, but do not necessarily capture the same activities.

The three approaches may resemble the DPSIR (drivers-pressures-status-impact-response) approach and derivatives.⁴⁶ Yet, unlike DPSIR the three approaches highlight the diverging implications of pressures and impacts for management. Further, the uncertainty attached to the impact (and status) approach, and the subsequent lack of obvious management responses, highlights the need to focus on responding to the pressures, the environmental effects of which are largely known, as opposed to tracing impacts of combined or individual activities in the environment. Assessing impacts on a confined area or by a limited set of activities will contribute only to solving local, limited and short-term problems, as long as global pressures are defined as out-of-scope.

Application to the Norwegian IMM Plans

Identification of the applied targets, scales, knowledge bases and management responses allows for assessment of the contribution of each of these three approaches. The implications of each approach as embedded in the Norwegian IMM plans will be considered in turn following a brief introduction of these plans.

Introducing the Plans

The IMM plans do not endorse the categorisation of these three approaches, which is novel to this article. Yet, it is clear that the plans aim for the contributions resulting from all three approaches. The potential contribution of the mitigation approach is, for example, evident in the ‘vision to safeguard a clean and rich sea, so that future generations can continue to harvest the wealth of resources that the sea has to offer’,⁴⁷ and in the statement that ‘[t]he Norwegian marine areas shall be managed to preserve the diversity of ecosystems, nature types, species, and genes, and to maintain ecosystem productivity’.⁴⁸ Further, the contribution of the impact approach is evident in, for example, the goal that ‘the management regime will take special account of the need to protect vulnerable habitat types and species in particularly valuable and vulnerable areas’,⁴⁹ and that the ‘[p]opulations of endangered and vulnerable species and species for which Norway has a special responsibility will be maintained or restored to viable levels’.⁵⁰ Further, the contribution of the activities approach is reflected in the goals that

⁴⁶ J Patrício *et al.*, ‘DPSIR—Two decades of trying to develop a unifying framework for marine environmental management?’ (2016) 3 *Frontiers in Marine Science* article 177.

⁴⁷ Protecting the Riches of the Sea (n 2), at p. 7. Each of the management plans (n 2) reiterates this vision.

⁴⁸ Norwegian IMM Plans (n 2), at p. 15 (author’s translation).

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

‘activities shall be conducted in such manner that all ecological functions are maintained’⁵¹ and ‘the overall level of activity is adjusted to take account of environmental considerations’.⁵² This raises the question of whether the plans possibly contribute to these goals. A fine line exists between vivid, visionary language and promises and commitments to objectives. Yet, one can interpret the IMM plans as a genuine attempt to protect the marine environment, as reflected not just in these formulations, but also in the scientific and administrative resources invested in the plan-making procedures, their adoption at the highest ministerial level, their political importance as reflected in their inclusion in majority government platforms, and the final endorsement of the plans by the Norwegian Parliament.

As the plans attempt to protect the Norwegian marine environment, they call for some geographical and environmental elaboration. Norway’s vast and resource rich marine areas amount to more than two million square kilometres.⁵³ To manage these areas, Norway has adopted IMM plans for marine areas where it has extended entitlements.⁵⁴ The marine areas to which the IMM plans apply span from the intensively used Skagerrak and North Sea to the relatively less but still much used Norwegian Sea, to the less used areas of the Barents Sea. Until the most recent IMM plans were adopted in 2020, previous plans spatially divided these ocean areas into three individual plans for the North Sea and Skagerrak (North Sea), Norwegian Sea, and the Barents Sea and Lofoten (Barents Sea) respectively.⁵⁵ The division, which is based on ecological and administrative considerations, is still evident in the recent plans and in the description of the Norwegian policy concept of environmental status of the areas. Excluded from the plans’ scope are, broadly speaking, internal waters, coastal areas and fjords.⁵⁶ The plans build on so-called scientific bases or factual bases for the plans.⁵⁷ Naturally, the plans and factual bases are mutually dependent on each other. The knowledge provided sets premises for and gives direction to the plans, for instance, with regard to whether a plan focuses on reducing pressures, or considers the impact of pressures or certain activities.

The IMM plans are but a piece of the Norwegian environmental and activities management and regulatory system.⁵⁸ Relying on existing instruments, institutions, and budgets, they constitute an overview and offer an overarching regulatory layer by repeating, yet connecting and coordinating management measures aimed at marine environmental protection and conservation. The plans have a wide set of ambitions, such as sustainable use of the areas, facilitating the operations of industries and their co-existence, and contributing to employment in coastal regions.⁵⁹ More implicitly, plan-making procedures result in knowledge production, function as a coordination instrument for ministries and directorates, and provide for

⁵¹ *Ibid.* Expressed in relation to certain marine nature types.

⁵² Norwegian Sea IMM Plan (n 2), at p. 12.

⁵³ The territorial sea, exclusive economic zone and fisheries protection zones around Svalbard and Jan Mayen amount to 2,031,734 square kilometres, according to the Norwegian Mapping Authority (<https://www.kartverket.no/Kunnskap/Fakta-om-Norge/Sjoarealer/Sjoomrader/>; accessed 29 October 2018).

⁵⁴ See LOSC (n 24).

⁵⁵ North Sea IMM Plan (n 2); Norwegian Sea IMM Plan (n 2); Barents Sea IMM Plan (n 2).

⁵⁶ Norwegian Sea IMM Plan (n 2). One exception is part of the Vestfjorden, which is included due to its ecological importance.

⁵⁷ The scientific or factual bases consist of multiple documents that assess the socio-economics activities operating in the marine areas and the effects of these activities on the environment, and provide ecological assessments and summaries thereof. The reports (in Norwegian) are available at <https://havforum.miljodirektoratet.no/kunnskapsgrunnlaget/>.

⁵⁸ The IMM plans comprise one set of instruments of a larger regulatory system. On the Norwegian regulatory system, and how a set of instruments cannot exhaustively depict the law, see JC Fløysvik Nordrum, *Bedre Regulering?: Årsak-Virkningsanalyser I Norsk Reguleringsprosess*, 1st ed. (Gyldendal, Oslo, 2019), at pp. 106–107 (in Norwegian).

⁵⁹ Norwegian IMM Plans (n 2), at p. 15.

parliamentary review of Norwegian ocean policies. Nonetheless, the analysis here focuses on the IMM plans' contribution to environmental objectives in terms of the mitigation approach, the impact approach, and the activities approach.

The Mitigation Approach of the IMM Plans

The Norwegian IMM plans do not explicitly target the general reduction of pressures in the sense that reduction of pressures is not set out as an aim. Nonetheless, the plans identify some pressures and capture certain measures. The extent to which these efforts align with the mitigation approach in terms of target, scale, knowledge, and management response is examined below.

The IMM plans proclaim to be a tool for the preservation of the Norwegian marine areas. Yet, these areas nonetheless depend on preservation at all scales as per the macroecological perspective. The recent IMM plans explicitly acknowledges this, pointing to how the Norwegian marine areas are part of a connected ocean system affected by what happens in other parts of the world's ocean, and 'that the entire system is exposed to climate change and other large-scale influences'.⁶⁰

Further, the IMM plans refer to how the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report on the global assessment of biodiversity and ecosystem services has identified five direct drivers or main pressures on the global marine environment.⁶¹ These are (where the first and second are ranked as those with greatest impact):

1. Fisheries and other harvesting of marine organisms;
2. Change in area use on land and at sea, including development of infrastructure and aquaculture in the coastal zone;
3. Climate change;
4. Pollution and waste; and
5. Invasive and alien species.⁶²

Although the IMM plans list these pressures, they do not explicitly subscribe to them. Rather, they identify climate change as the pressure with greatest impact on Norwegian marine areas, and move on to focus on its impacts.⁶³ Further, the plans assess the pressure of certain local activities on the marine areas.⁶⁴

The IMM plans, as mentioned above, explicitly identify the third pressure (climate change). Although the main focus is on the impact of this pressure, the plans also briefly

⁶⁰ *Ibid.*, at p. 58 (author's translation).

⁶¹ The IPBES report (n 22) (at p. 12) list of five direct drivers could be aligned with the main pressures on the global marine environment as per the WOA1 (n 22). Chapter 54 of WOA1 identifies seven main pressures: climate change; fishing; marine pollution; increased demand for marine space; underwater noise; interfering constructions; non-native species. In alignment, these are roughly similar considering that the second of the IPBES report direct drivers include interfering structures, and since pollution as IPBES report direct driver includes noise. Because the direct drivers of the IPBES report align with the main pressures as per WOA1, they are both categorized as main pressures for the remaining of the analyses. The reference in the Norwegian IMM Plans (n 2) document to the IPBES report at p. 7 (the summary) mentions all five direct drivers, whereas at p. 59 only four are mentioned (invasive and alien species are excluded). It is assumed here that the latter is an error. The full IPBES report, in Chapter 2.1.12 overview of direct drivers, at p. 105, provides details on these five direct drivers (available at https://ipbes.net/sites/default/files/ipbes_global_assessment_chapter_2_1_drivers_).

⁶² IPBES report (n 22), at p. 12.

⁶³ Norwegian IMM Plans (n 2), at p. 59.

⁶⁴ *Ibid.*, at p. 74, 81, and 88. However, this document does not include a description of the collective impact of these selected activities. Assessing the collective impact on a limited area is challenging using the macroecological perspective.

describe and refer to some knowledge, some potential management efforts, and some implemented management efforts in response to climate change.⁶⁵ The plans clearly identify the fourth pressure (pollution and waste) in the descriptions of environmental status of the different ocean areas.⁶⁶ The plans include only some management responses to this pressure, referring, amongst others, to how many of these inputs are transported from other countries. How Norwegian citizens or activities contribute to these inputs is not problematised.⁶⁷ Further, the plans identify the fifth pressure (invasive and alien species), and include one measure to reduce the number of Pacific oysters,⁶⁸ noting, however, that former plans included further measures to this end.⁶⁹

The plans also identify the first pressure (fisheries and harvesting). The IMM plans state that fisheries have a great impact on ecosystems,⁷⁰ and a former plan has stated how the ‘human activity that currently puts most pressure on the Norwegian Sea during normal activities is the fisheries’.⁷¹ Yet, the plans do not discuss the global scope of this pressure, how it affects Norwegian fisheries management, and the many ways beyond fisheries management that Norway could influence this global pressure. Nonetheless, a former IMM plan does refer to some responses to this global pressure, such as illegal, unreported and unregulated (IUU) fishing measures, port State and market State measures, and international cooperation.⁷²

Whether the IMM plans identify the second pressure (change in area use on land and at sea, including development of infrastructure and aquaculture in the coastal zone) is difficult to evaluate. Generally, the plans call for increased use of the ocean by existing and emerging industries, including marine aquaculture, in all marine areas.⁷³ The plans also include restrictions on certain activities, such as banning petroleum activities from some areas and facilitating protected marine areas.⁷⁴ Regardless, the increased use of, for example, the North Sea, ‘Norway’s most intensively used sea area and one of the most heavily trafficked in the world’,⁷⁵ is not problematised in the discussion of or responses directed at reducing the intensity of uses. Rather, the plans promote the strengthening of ‘continued value creation through use

⁶⁵ *Ibid.*, at pp. 59–66, 130, and 90 respectively. Beyond the IMM plans, certain goals for the purpose of climate change mitigation are included in the Act relating to Norway’s Climate Targets (Climate Change Act) (LOV-2017-06-16-60). Existing measures to meet these goals are spread across multiple regulatory instruments, including the Greenhouse Gas Emission Trading Act of 17 December 2004 and the Act relating to Tax on Discharge of CO₂ in Connection with Petroleum Activities on the Continental Shelf of 21 December 1990. A climate change policy has yet to be adopted with measures to achieve these aims while targeting emissions of multiple sectoral activities.

⁶⁶ Norwegian IMM Plans (n 2), at pp. 20, 40, 47, 49. Beyond the IMM plans, measures to reduce pollution and waste include the Act concerning Protection against Pollution of 13 March 1981 and concerning Waste and the White Paper on Waste Policy and Circular Economy (Meld. St. 45 (2016–2017)).

⁶⁷ Norwegian IMM Plans (n 2), at p. 139.

⁶⁸ *Ibid.*, at pp. 39, 139.

⁶⁹ With regard to ballast water, the North Sea IMM Plan (n 2), at chapter 3.2.10, refers to response measures set out in the international regulations under the Ballast Water Management Convention. Further, the IMM plans refer to some measures concerning inputs and clean-up of marine (plastic) pollution (e.g., North Sea IMM Plan (n 2), chapter 4.2), but do not discuss the range of measures available. Beyond the IMM plans, the Act No. 100 relating to the Management of Biological, Geological and Landscape Diversity of 19 June 2009 includes restrictions on the introduction of alien species.

⁷⁰ Norwegian IMM Plans (n 2), at p. 74.

⁷¹ Norwegian Sea IMM Plan (n 2), at p. 55.

⁷² *Ibid.*, at p. 133.

⁷³ Norwegian IMM Plans (n 2), at p. 136 (referring to areas opened for petroleum exploration as per the award of licenses for the production of oil and gas for 2019) and at pp. 134 and 137 (indicating where areas will be opened for renewable energy production). Beyond the IMM plans, sectoral instruments exist that facilitate increased use, for example, Act No. 7 of 2019 on Mineral Activities on the Continental Shelf.

⁷⁴ *Ibid.*, at pp. 131, 138.

⁷⁵ North Sea IMM Plan (n 2), at p. 7.

and harvesting of the area'.⁷⁶ The most recent IMM plans mention increased use of marine areas as a pressure, framing it as a consequence of adopting climate change mitigation measures: 'measures that shall give necessary emission reduction will increase the need to use the ocean areas' and 'when the ocean to an increasing extent is put to use to reduce the global emissions of climate change'.⁷⁷ In any event, the pressure is identified by the IMM plans, although economic concerns may have outweighed it, as, overall, the IMM plans primarily facilitate increased ocean use.⁷⁸

With regards to providing relevant knowledge for the mitigation approach, the plans, including their scientific bases, do not discuss pressures (as opposed to their impact) on the global marine environment or how these pressures fall under Norwegian jurisdiction and influence. Such knowledge is likely rendered beyond the scope of the plans. Individually and in fragments, the plans do provide information on some individual pressures, such as fisheries (management strategies of unhealthy fish stocks, IUU fishing measures, port State and market State measures, and international cooperation). Beyond that, the plans focus on the pressures of activities operating locally, primarily food production, shipping, and petroleum exploration and exploitation.⁷⁹

Although the IMM plans capture certain management responses to mitigate pressures, they do not attempt to address pressures systematically, or discuss common or root causes of pressures to suggest consistent measures. Such attempts are likely considered beyond their scope. Moreover, for the pressures that are identified, the plans adopt measures that are limited in scope. Consequently, while the IMM plans do identify some global pressures on the marine environment, they do not target them systematically, in terms of obtaining knowledge about the pressures and discussing the range of relevant Norwegian responses to them. Further, the IMM plans only capture a limited set of responses to some individual main pressures. Therefore, a mitigation approach is embedded in the plans only in fragments.

The Impact Approach of the IMM Plans

The IMM plans assess environmental status of the three marine areas, categorising some areas as particularly valuable and vulnerable, and some habitat types and species as vulnerable.⁸⁰ All these types of categories reflect assessments of impact. However, the analysis focuses on the most elaborate of these, namely, vulnerability analysis. Although vulnerability analysis is part of a value and vulnerability analyses, only the vulnerability analysis is considered here, because value analysis appears to have objectives beyond environmental considerations.⁸¹

⁷⁶ *Ibid.*, at p. 13.

⁷⁷ Norwegian IMM Plans (n 2), at pp. 64–65 (author's translation). If these statements are to be taken literally, some goals of the plans should be adjusted. Seemingly the goal is to increase the use (and thereby pressures) for the purpose of reducing climate change emissions. Such a strategy could benefit from a transparent discussion, including a thoroughly account of the how the reduction of emissions is to be achieved.

⁷⁸ See note 74.

⁷⁹ Professional Forum for Norwegian Sea Areas, *Samlet påvirkning og miljøkonsekvenser: Faggrunnlag for revisjon av forvaltningsplanen for Barentshavet og havområdene utenfor Lofoten* [Scientific basis of 2019 to the coming revision of the Integrated Plan for the Barents Sea], Report No. M-1299 (2019) (in Norwegian), at p. 29, available at <https://www.miljodirektoratet.no/publikasjoner/2019/april-2019/samlet-pavirkning-og-miljokonsekvenser/>.

⁸⁰ As per all of the IMM plans (n 2). A new classification system of ecological status is being developed. See Norwegian IMM Plans (n 2), at p. 17.

⁸¹ O Irish, 'Identifying ecological hotspots in the United States and Norway: Turning ecosystem-based management into practice?' (2018) 98 *Marine Policy* 65–76, at pp. 68–71, identifies the steps of the process leading to a value and vulnerability analysis.

Vulnerability in the IMM plans means ‘sensitivity of the identified ecological areas in relation to the human activities fishing, shipping, petroleum, and external influences’.⁸² Thus, the vulnerability analysis targets the impacts of pressures on a certain area. Moreover, the delimitation or scale of a vulnerable area depends on how effects play out in marine ecosystems, natural systems and on single species, as expressed in the IMM plans. However, while the 2005 vulnerability analysis for the Barents Sea identified sixteen vulnerable areas or types of areas,⁸³ only seven of these, including the four most vulnerable, were included in the plan. Why the remaining nine were not included in the plan is unknown to the author.⁸⁴

The next question to consider is which management responses can be associated with the vulnerability analysis. The North Sea IMM Plan holds:

The designation of areas as particularly valuable and vulnerable does not have any direct effect in the form of restrictions on commercial activities, but indicates that these are areas where it is important to show special caution. To protect particularly valuable species and habitats, it is for example possible to use current legislation to make activities in such areas subject to special requirements.⁸⁵

Therefore, vulnerable areas in the plans are not regarded as providing limitations to activities as such, but as indicators of special caution when undertaking activities. This understanding is also evident in practice, for example, in Norway’s opening of new areas for petroleum production very close to and even inside vulnerable areas,⁸⁶ and allowing fisheries activities in these areas.⁸⁷ Special caution is exercised in vulnerable areas for these activities, for example, the requirements banning exploratory drilling during certain time periods⁸⁸ and environmental requirements applicable to certain activities.⁸⁹ Thus, the management responses relevant for the impact approach relate to the capacity of being vulnerable. However, the IMM plans and their scientific bases provide no assessment of robustness to support whether these areas might tolerate existing activities (and new activities facilitated by the plans). A more reasoned and explicit robustness test would be particularly interesting for the North Sea and Skagerrak area in light of this area’s unsatisfactory environmental status. Nonetheless, it is clear that an impact approach is embedded in the IMM plans.

⁸² E Olsen, ‘Identifying particularly valuable and vulnerable areas: A key tool for the integrated management plans for the Barents Sea and Norwegian Sea,’ ICES CM 2008/E:14 (2008).

⁸³ Irish (n 81), at p. 70; M Knol, ‘Mapping ocean governance: From ecological values to policy instrumentation’ (2011) 54(7) *Journal of Environmental Planning and Management* 979–995, at p. 986.

⁸⁴ These analyses are under reassessment as per the Norwegian IMM Plans (n 2). Similar numbers for the Norwegian Sea and North Sea are unknown to the author.

⁸⁵ North Sea IMM Plan (n 2), at p. 41; similarly, Norwegian IMM Plans (n 2), at p. 7.

⁸⁶ E Johansen, ‘Norway’s integrated ocean management: A need for stronger protection of the environment?’ 32 *Ocean Yearbook* 239–263, at p. 261. Johansen shows how identification as a vulnerable area (and significant gaps in knowledge) does not hinder Norway from opening new areas for petroleum production very close to such an area. Since 2016, Norway has opened several areas for petroleum production within vulnerable areas. For 2019, see Ministry of Petroleum and Energy, ‘TFO 2019: Stor interesse for norsk sokkel’ Press Release No. 044/19 (4 September 2019) available at <https://www.regjeringen.no/no/aktuelt/tfo-2019-stor-interesse-for-norsk-sokkel/id2667425/>.

⁸⁷ See, for example, M-1299 (2019) (n 79).

⁸⁸ See, for example, Norwegian Sea IMM Update (n 2), at pp. 95–97.

⁸⁹ See, for example, the environmental requirements applicable to the 2019 award of licenses for the production of oil and gas. Norwegian Petroleum Directorate, ‘TFO 2019: Miljø-, HMS-, og fiskerivilkår’ available at <https://www.npd.no/globalassets/1-npd/fakta/utvinningstillatelser/konsesjonsrunder-nor/tfo-2019/miljo-hms-og-fiskerivilkar-tfo-2019.pdf>.

The Activities Approach of the IMM Plans

The activities targeted by the IMM plans include the existing and expanding petroleum industry,⁹⁰ shipping, and marine food production (including commercial fisheries) in the area.⁹¹ The plans capture a selection of environmental effects related to the petroleum industry, including emissions into the air and sea during production, noise from seismic surveys, and physical disturbances. Implicitly, other effects are beyond the scope of the IMM plans. Therefore, the IMM plans do not address potential negative effects of the related offshore supply and service industries, except to the extent that these are captured by shipping (note that coastal areas are excluded from the scope of the IMM plans). The plans expect petroleum production to increase in the coming years,⁹² yet do not state generally whether environmental effects are expected to increase or decrease.

The environmental effects of shipping in the areas captured by the IMM plans include emissions to air, the spread of non-native species via ballast water or biofouling, and noise. The IMM plans project an increase in shipping traffic of 41 per cent by 2040,⁹³ yet expect emissions of climate gases to decrease.⁹⁴ The environmental effects of the marine food production industry captured by the plans include the removal of fish resulting from fisheries, bottom trawling, accidental by-catch, marine waste, and underwater noise. Moreover, the plans capture certain effects of the emerging offshore aquaculture industry. Finally, the plans briefly describe the tourism industry and emerging marine industries (including offshore wind power, marine bioprospecting, seabed mining, and carbon capture and storage) and some of their environmental effects.⁹⁵

The scale of these activities is, seemingly, those operating in or those that may operate in the Norwegian marine areas in the future. Certainly none of these industries exist and operate only in these waters, as they have port and land-based facilities and transport and export products elsewhere. Thus, all these industries have negative environmental effects throughout their life cycle that are implicitly beyond scope of the IMM plans. It should be noted, however, that at least some of these effects could be subject to other (sectoral) management regimes.

The knowledge in the scientific bases of the plans captures the petroleum, shipping, and commercial fisheries sectors, and the aforementioned environmental effects in Norwegian marine areas.⁹⁶ Earlier versions of the IMM plans provided descriptions of the cumulative impact of the captured activities in each of the three marine areas. Whereas the most recent IMM plans highlight the importance of understanding the collective impact of all activities, the plans do not provide such a description, referring to the need for more knowledge and the need to develop methods to this end.⁹⁷ This supports the argument made herein that assessing which exact pressure an impact stems from is easy in some instances, but is challenging if not impossible in most.⁹⁸ Knowledge on each of the targeted activities, as well as on the impact of

⁹⁰ Norwegian IMM Plans (n 2), at p. 82.

⁹¹ *Ibid.*, at pp. 77, 68.

⁹² *Ibid.*, at p. 82.

⁹³ *Ibid.*, at p. 77.

⁹⁴ *Ibid.*, at p. 81.

⁹⁵ *Ibid.*, pp. 92–99.

⁹⁶ See note 58.

⁹⁷ Norwegian IMM Plans (n 2), at p. 55. Interestingly, section 10 of the Act No. 100 relating to the Management of Biological, Geological and Landscape Diversity of 19 June 2009 imposes an obligation on authorities to take into account the total load upon an ecosystem when considering one pressure on an ecosystem. Yet, as set out in section 2 of this Act, this obligation only applies ‘as appropriate’ (author’s translation: ‘*så langt de passer*’) to the continental shelf and exclusive economic zone of Norway.

⁹⁸ Halpern *et al.* (2008) (n 34).

climate change and long-range transport of pollution on the Norwegian marine areas, is nonetheless included in the plans.⁹⁹

The next question to consider is the extent to which the IMM plans include management responses that target the reduction of environmental effects within the confined scope and scale of the activities approach. Management responses that call for the relocation or restriction of activities for environmental reasons include the designation of certain areas as vulnerable (and valuable) and the proposed establishment of marine protected areas.¹⁰⁰ Another concrete management response includes the geographical constraints on the expansion of the petroleum activities. Whereas the plans facilitate the expansion of petroleum exploration and exploitation, only the constraints are deemed relevant for this environmentally focused analysis. (This fact illustrates how an activities approach increases negative environmental effects simply by facilitating an increase in activities.)

Another management response of the plans is the ambition to halve greenhouse gas emissions from national marine transport and fisheries by 2030.¹⁰¹ A framework for offshore aquaculture within an environmentally sustainable framework will be developed.¹⁰² The plans state that in opening areas and determining conditions for offshore renewable energy production, further knowledge on seabirds will be appreciated.¹⁰³ Finally, the plans call for working towards a tightening of the ship safety regime and looking into the possibility of limiting the extent of cruise tourism around Svalbard.¹⁰⁴

Beyond the aforementioned area-based management responses, responses are few, and many are vague.¹⁰⁵ Yet, many relevant and important responses exist in Norwegian sectoral and cross-sectoral regulations, such as harvesting rules for fisheries and emissions regulations for all sectors. The plans do not make clear why some are included while others are not. The plans seemingly only capture new responses applicable to these marine areas. Where the plans include management responses, alternatives are not openly discussed, making it difficult to evaluate whether these responses take appropriate account of environmental concerns.

The IMM plans identify some of the environmental effects of petroleum activities, fisheries, and maritime transportation, while disregarding other negative effects of the included activities as likely beyond their scope. The knowledge in the scientific bases of the plans captures these sectors and considers their selected environmental effects. The plans include some relevant responses. Consequently, an activities approach is embedded in the IMM plans.

As noted above, the activities approach alone—even if applied by all States—will not lead to long-term conservation and protection of the marine environment. The activities approach, as embraced by certain statements in the IMM plans, in contrast, seemingly considers that such an approach will contribute to conservation and protection of the marine environment. For example, ‘[t]he management plans ... manage the use of the ocean so that ecosystems maintain their natural functioning and deliver ecosystem services’¹⁰⁶ and ‘[i]n marine habitats that are particularly important for the structure, functioning and productivity of ecosystems, activities will be conducted in such a way that all ecological functions are maintained.’¹⁰⁷

⁹⁹ Further, the factual base for the Barents Sea provides an assessment of combined effects per ecosystem component. See M-1299 (2019) (n 79).

¹⁰⁰ Norwegian IMM Plans (n 2), at p. 138.

¹⁰¹ *Ibid.*, at p. 130.

¹⁰² *Ibid.*, at p. 131.

¹⁰³ *Ibid.*, at p. 137.

¹⁰⁴ *Ibid.*

¹⁰⁵ As discussed above, obtaining information is not considered a response under the activities approach.

¹⁰⁶ Norwegian IMM Plans (n 2), at p. 12.

¹⁰⁷ *Ibid.*, at p. 15. Yet, at p. 54 it is stated that there is uncertainty as to how activities within a defined (valuable and vulnerable) area affects the ecology and biodiversity of that area.

Regardless of how strict the activities captured by the IMM plans are managed (even if they were banned), management of these activities alone cannot ensure that ecological functions are maintained. Other pressures on these marine areas, such as climate change and long-range transported pollution, would and will hamper management attempts unless such pressures are concurrently mitigated by relevant management regimes. Norway is not alone in designing integrated marine policies that promise more than they contribute to. The European Union Marine Spatial Planning Directive takes a similar approach by targeting marine activities in a confined marine area, yet aims for the preservation, protection and improvement of the marine environment.¹⁰⁸ By capturing only certain marine activities, in other words a selection of pressures that arguably does not reflect fundamental, main or necessary pressures (for example, as aligned with the IPBES list or WOA1 taxonomy of pressures), but those relevant for a more limited purpose, the directive cannot possibly contribute to long-term protection and conservation of the marine environment as per the mitigation approach.

Discussion and Concluding Remarks

The IMM plans have collected and connected information on marine activities and some management efforts to preserve Norwegian marine areas based on sectoral and topical policies, plans, and management efforts. The overview they provide has made evaluation of different approaches to marine environmental protection possible. Now the time has come to clarify and refine the environmental approaches captured by the IMM plans.

Based on this analysis of the three approaches, the IMM plans take a mitigation approach only in fragments. The plans do refer to a set of main human pressures on the marine environment, but they do not link these with relevant management responses within the jurisdictional capacities of Norway (and the more limited scope of the plans). The plans could further consider the pressures jointly in order to address them systematically and target any common root causes of these pressures. Yet, it must be reiterated that Norwegian environmental efforts relevant to the mitigation approach exist beyond those captured by the IMM plans. Seemingly, the plans have deemed these efforts as beyond their scope.

The impact approach is vested in the IMM plans in terms of, for example, vulnerability analysis. The knowledge sought under this approach supports vulnerability, unlike robustness. The implied robustness of the remaining marine areas, in support of existing and expanding activities, could benefit from a transparent and adequate explanation.

The activities approach outlined here is embedded in the IMM plans. They embrace some environmental effects of a selection of activities, primarily petroleum production and fisheries. Although some restrictions are imposed on these activities, contrary to statements in the IMM plans, these responses alone cannot maintain ecological functions. Rather, they reduce some environmental harm or result in some environmental improvement. To avoid potential misconceptions by politicians, managers and stakeholders, no aims beyond those possibly achievable by the activities approach should be included in the plans. Designing integrated marine policies that aim for more than they can possibly accomplish is not unique to Norway. The EU Marine Spatial Planning Directive takes a similar approach by targeting marine

¹⁰⁸ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257 (28 August 2014), Articles 5 (2). Similarly, Article 1 of the Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 (25 June 2008) calls for Member States to adopt marine strategies (programmes of measures) to achieve or maintain good environmental status of the marine environment.

activities in a confined marine area, yet aims for objectives beyond those possibly achievable by this approach.

The IMM plans capture the impact and activities approaches, but capture the mitigation approach only in a fragmented way. As per the IMM plans, the main pressures on Norwegian marine areas at large are those threatening the global marine environment, meaning that the contribution of Norway to the conservation and protection of the marine environment would be relatively small, as Norway is but one of 200 sovereign States. It must be highlighted that Norway is a major contributor to some of these global pressures.¹⁰⁹ However, the IMM plans do not target pressures resulting from Norway or Norwegian citizens or activities generally, only some of the effects of a selection of activities. Although through their approaches the plans facilitate some reduction of environmental harm or improvement in the environment from these selected activities, their overall contribution to the protection of the marine environment is limited, if not negative. By facilitating an increase in activities, the IMM plans likely lead to an increase of negative effects on the marine environment. The IMM plans should clarify the environmental objectives they aim for and the limited contribution they make to marine environmental protection arising from their limited scope.¹¹⁰ In any event, the plans and the plan-making procedures provide knowledge on the status and trends of national marine ecosystems that could and should be important premises of management. The activities approach is further demanded by the integration principle.¹¹¹

The IMM plans aim for a broad set of objectives beyond that of protecting the environment. In light of the problem analysis and the three approaches discussed above, this author questions whether it is not only the trade-off against other objectives that has led to the limited environmental contribution, but also the scope and approach, of the plans. For example, regulatory efforts to mitigate global pressures exist, yet these are not recognised by the plans.

Could the IMM plans rightfully be issued in the name of ecosystem management given their limited environmental contribution? Many versions of the ecosystem approach¹¹² capture all or one of the three approaches discussed here. It illustrates how such approaches could capture both net-negative contributions and small contributions to the environment in terms of the activities approach and the more considerable contributions of the mitigation approach. Both conceptualisation and management of the marine environment could benefit from refinement with regard to these differences. The diverging implications outlined in these three approaches calls for cautiousness in combining them. Otherwise, holistic ambitions, whether in the name of marine ecosystem governance, integrated management or both, may easily miss their target or aim for more than they can possibly accomplish.

Environmental ambitions (including that of this article) can be full of pitfalls, even following a problem analysis, especially if the problem analysis is not explicit. Norway is not alone in having environmental ambitions. The IMM plans blend ambitions across the three

¹⁰⁹ For example, with regard to per capita carbon dioxide emissions, Norway ranks number 8 in Europe and number 29 in the world. Gapminder, 2017 figures (the most recent figure available in February 2021).

¹¹⁰ Johansen (n 86), at p. 262, notes the IMM plans otherwise '[r]isk being used to legitimize the process as integrated and well-balanced'.

¹¹¹ CBD (n 9), Article 6(b)

¹¹² See, for example, D Vousden, 'Large marine ecosystems and associated new approaches to regional, transboundary and "high seas" management' in R Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Edward Elgar, Cheltenham, 2015) 385–410; D Langlet and R Rayfuse (eds), *The Ecosystem Approach in Ocean Planning and Governance: Perspectives from Europe and Beyond* (Brill, Leiden, 2019); E Domínguez-Tejo *et al.*, 'Marine spatial planning advancing the ecosystem-based approach to coastal zone management: A review' (2016) 72 *Marine Policy* 115–130; V De Lucia, *The 'Ecosystem Approach' in International Environmental Law: Genealogy and Biopolitics* (Routledge, Abingdon, 2019); P Singh and A Jaekel, 'Future prospects of marine environmental governance' in M Salomon and M Till (eds), *Handbook on Marine Environment Protection: Science, Impacts and Sustainable Management* (Springer International Publishing, Cham, 2018) 637–657.

approaches outlined here with a management scope that is only consistent with parts of two of these approaches. The case of Norway offers an example of an integrated marine policy that is a ripe for remaking. Integrated marine policies may provide local ecological assessments, give guidance on future status trends, and be an instrument for applying the integration principle on combined effects (to the extent possible). These aspects may be useful premises for activities planning. However, mitigation is perhaps too big a topic, too demanding in scope (with regard to prioritisation between national interests) and too different from marine activities planning to be included in such policies. If this is the case, integrated marine policies will never lead to long-term conservation and protection of the marine environment, but will maintain their relevance for more restricted environmental objectives.

Paper III

Schøning, Lena. "If Ocean Management is your Regime, which Objectives are Consistent with its Scope?" *Submitted manuscript*

If Ocean Management is your Regime, which Objectives are consistent with its Scope?

Abstract: This analysis looks beyond the ocean management process to discuss which aspects of societal objectives is compatible with ocean management. Regimes and concepts of ocean management are associated with high ambitions to achieve environmental, economic, and social objectives, yet ocean management involves a confined scope. This analysis investigates the objective of protecting the marine environment through the reduction of environmental pressures, and assesses to what extent this is consistent with the scope of ocean management. Further, the consistency of certain economic and social objectives are briefly outlined. On this basis, the paper draws some conclusions on the potential of ocean management.

Key words: integrated ocean management, marine spatial planning, ecosystem-based ocean management, ocean governance, marine ecosystem management

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1. Introduction

We are standing on the verge of the UN Decade of Ocean Science for Sustainable Development (2021-2030) [1], while important research programs, such as the proposed EU Horizon Europe, target healthy oceans [2] and ocean governance [3]. Multiple concepts and regimes concern the management of a coastal and marine area [[4] p.95, [5] p.468 and 473], whether in the name of integrated ocean management [[5], [4]], or marine spatial planning [[6], [7]]. High ambitions are associated with these concept and regimes.

The question remaining is why it is appropriate to group management efforts in a regime premised on a geographically confined coastal and marine area. Which societal objectives are appropriately addressed by compartmentalizing the co-management of coastal communities, marine activities and a marine space in one regime? Generally, ocean management concepts and regimes are explained as important for overall societal objectives, often expressed as sustainable development [[7] p.1, [8] p.160], sustainable ocean economy [[9], [10]], conservation and sustainable use in an equitable way [[11], [12] p.37] or a threefold set of environmental, economic and social objectives [[7] p.1, [4] p.100]. For example, the EU Marine Spatial Planning Directive defines marine spatial planning as a “process ... to achieve ecological, economic and social objectives” [6]. Yet, the assumption of this analysis is that management efforts systematized in ocean management regimes are no universal remedy [[7] p.13, [13] p.349-350], but may be appropriate for dealing with some limited aspects of such broad objectives. The potential objective to be scrutinized in this paper is the protection of the marine environment through the reduction of environmental pressures. Further, the analysis will briefly outline the extent to which certain economic and social objectives are compatible with the ocean management regime.

Consequently, the analysis looks beyond a (perfect) ocean management process, to focus on how ocean management (was it perfectly implemented) has the potential to contribute to aspects of societal objectives. The scholarly literature often focuses on procedural aspects of ocean management [[7] p.1, [8]p.162, [10], [14], [15], [16] p.190-193, [17], [12] p.36], as the “process ... to” [6] part of the EU Marine Spatial Planning Directive definition also suggests. Studies focusing on “realities” of ocean

management are rarer [18] p.263. This analysis aims to complement these studies by exposing what those processes concern.

Yet, one could question why the analysis discusses objectives in generalized terms, since the “ecological, economic, and social objectives (...) are usually specified through a political process” [19] p.18, and management objectives are a matter of societal choice, *e.g.* as proclaimed by the first Malawi principle of the ecosystem approach [11]. In a recent study discussing integrated ocean management (IOM) and drawing lessons from a set of case studies, Winther et al. state how

A final lesson is that due regard needs to be given to context. It is critically important to tailor IOM to the characteristics and needs of the region in question. The concrete economic activities, community needs, societal goals and environmental pressures should be the point of departure for the development of IOM. This is a shared experience across all the case studies [10] p..

Winther et al. hold that integrated ocean management should be tailored to the characteristics and needs of the region in question, which this paper certainly endorses. Nonetheless, across communities, community needs and societal goals have many similarities. For example, all communities are facing environmental pressures of a global scale. Moreover, whether the needs and objectives are particular or generic, only some of them are compatible with the scope of ocean management.

Ocean management concepts and regimes often position the environmental objective prominently, whether phrased as protection of the (marine) environment [[20] p.39, [8] p.160, [4] p.100, [14] p.417], or as ensuring the resilience of marine ecosystems [10] p.1. For reasons of space, this analysis focuses on a core aspect of the environmental objective – the reduction of environmental pressures. Yet, it should be noted that in ocean management the focus on reducing environmental pressures in ocean management is a vast topic in itself. Consequently, the analysis provides a helicopter perspective that is low in resolution (details unfocused), and ought to be read as such.

Next, section 2 introduces the mandate or scope of ocean management, before section 3 introduces the environmental pressures, and section 4 discusses the compatibility. Then, section 5 provides a brief outline of the consistency of some economic and social objectives with the scope of ocean management, before section 6 concludes the analysis.

2. The Scope of Ocean Management

Ocean management is often conceptualized as integrated [21] p.3, holistic [12], interconnected [22] p.352, or ecosystem-based (considering “the entire system” [23] p.142). For some, “management efforts (...) structured around a single place or ecosystem, with the health and productivity of that ecosystem or group of ecosystems as the nucleus of management” amounts to ecosystem-based management [[24] p.356, [25] p.465]. While these conceptualizations may leave the impression that they are all-encompassing, ocean management certainly does not contribute to environmental objectives alone. Rather, all management efforts have some more or less, direct or indirect, environmental effects. Accordingly, management efforts that may be deemed relevant for environmental objectives may be spread across the entire larger management complex of regimes in which the ocean management regime is embedded. This complexity explains the usefulness of a exposing what ocean management is and the specific objectives to which it contributes.

A primary focus of ocean management is activities taking place at sea [26] p.31. A place-based approach is often highlighted [27], such as per Craig and Hughes stating how “[m]arine spatial planning or place-based management ... seeks to address all human uses of a particular marine environment in

a comprehensive governance regime” [28] p.113. Similarly, yet more specifically, the ocean management that this analysis investigates captures the management of coastal communities, the co-management of marine (or maritime) activities of a confined coastal and marine space, and the “managing” of a geographically confined coastal and marine area. The marine activities include, for example, fisheries, tourism, offshore aquaculture, seabed mining, and offshore energy production. Shipping, however, enjoys privileges at sea that make this marine activity less eligible for co-management [29]. The co-management of marine activities captures ways of integrating management of marine activities stretching from cooperation to common instruction. The “managing” of the coastal and marine space involves a mandate to restrict activities present in that area. One alternative to ocean management is sectoral management. Another is management of activities, communities, and areas combined and co-managed according to a different combination than that of ocean management, such as combining coastal and non-coastal communities, marine and land-based activities, or marine and terrestrial space.

This analysis takes a narrow approach to management as that which is based on formal legal authority. The actors with legal authority over humans and human activities [30]p.289, and consequently over coastal communities and marine activities, are nation states (states). States are also the actors with legal entitlements over coastal [30]p.289 and marine spaces [31] (subject to some restrictions concerning shipping etc. [29]) except for the high seas, where states enjoy such rights collectively [32]. Accordingly, this analysis approaches management as management conducted by states or through the delegation of state power [4] p.3. States typically do not delegate authority to manage humans, activities, or spaces to regional ocean management initiatives, *i.e.* those involving more than one state. For example, the integrated management of the coastal zones of the Mediterranean includes procedural obligations such as knowledge-sharing and coordination, and certain restrictions that each state undertake upon themselves [33]. Yet, an example of states’ delegation of power over activities to the EU is the EU Common Fisheries Policy [34].

On the high seas, where no state enjoys sovereignty [35], any mandate to manage collectively on behalf of states is positively defined by subject-matter, such as the regional fisheries management organization ICCAT, which manages Atlantic tuna fisheries [36]. Nonetheless, international and regional arrangements are less relevant in light of the set scope of ocean management that concerns the co-management of humans, human activities, and marine spaces. Subject to the limits of their mandate, each arrangement could coordinate efforts that they manage individually. Thus, the management approach is relevant to the extent that these arrangements facilitate ocean management to be implemented by states.

In addition to the limited scope of ocean management, any individual ocean management regime is constrained by the framework of constitutional, institutional, cultural, ideal, and regulatory context [20] into which it is embedded [[4] p.97, [22] p.354]. The framework might be more or less crowded [20] or strong [9] p.27–28 depending on national and regional regulatory density, leaving less space for a scope of ocean management. These specific frameworks restrict the scope and consequently affect the potential of ocean management beyond those inherent restrictions that are a consequence of the limited scope.

Thus, the questions to be pursued is why a management regime would co-manage coastal communities, marine activities, and marine spaces. Sections 3 and 4 discuss whether the purpose is to protect the marine environment by reducing environmental pressures.

3. Introducing the Environmental Pressures

Protecting the marine environment means protecting the continuous reiterative complex life cycles of marine ecosystems and their components that are interconnected with larger socio-economic systems. Their continuous cyclical nature implies that protecting the marine environment is an objective that will not be met once and for all, but rather requires constant attention. Emphasizing the complexity of environmental issues, scholars have described them as a “wicked problem” [37], “a mess” [38], and a “hot situation” [39]. Consequently, protecting marine ecosystems is correspondingly difficult, demanding a complexity of management regimes and efforts. Although this analysis recognizes these complexities, in order to address it the analysis focuses on a single aspect of arguably high importance, *i.e.* the reduction of environmental pressures.

Multiple scientific reports on the status of the global marine environment indicate the urgency of addressing human threats to the ocean [40], [41], [42], calling for a reduction or mitigation (used interchangeably to broadly capture the reducing, hindering or preventing) of these threats or pressures. Therefore, reducing environmental pressures implies responding to environmental problems, unlike adapting to their consequences or assessing their impact. Whereas scholars generally subscribe to how ocean management is relevant for the protection of the marine environment [*e.g.* [4], [9], [14], [20]], some scholars even specify, for example, that marine spatial planning is relevant to the mitigating of climate change as well as to “reducing non-climate stressors and pressures (for example, pollution, over-fishing and habitat loss” [43] p.4. Finally, focusing on the environmental pressures (which results from humans and human activities) is beneficial for the analysis, which will assess the compatibility of these with ocean management. Per the definition, ocean management also captures certain humans and human activities (coastal communities and marine activities).

Any defined marine area subject to ocean management is impacted to some extent by different pressures. Exactly what these are depend on where the area is located since a dominant pressure could be local or regional. Nonetheless, due to the existence of global pressures [[40],[41]], global capacity constraints [[44], [45]], ocean currents, and the fluid nature of the sea, any confined marine area, regardless of where it is situated, depends on the marine environment at a larger scales. The macroecological perspective even questions the relevance of anything but the global scale [46]. Similarly, in a study of integrated ocean management Winther et al. highlights “the need to consider the totality of pressures on the entire ocean space” [10] p.1452. Thus, the pressures to be assessed for consistency with ocean management is the main environmental pressures on the global marine environment (which, however, also captures some local pressures as will be explained).

Building on two scientific reports, this section now briefly identifies these pressures. These are the First Global Integrated Marine Assessment, also known as “World Ocean Assessment I” (WOA1) [40] and the IPBES Global Assessment on Biodiversity and Ecosystem Services (IPBES report) [41]. Other ways of categorizing problems and objectives exist, such as the Sustainable Development Goals [47], the Ocean Health Index [48] and earth system governance [49] (building on planetary boundaries [44]). Compared to these broader and more complex perspectives, WOA1 and IPBES have the benefit of highlighting environmental pressures on the marine environment at a given scale.

WOA1 identifies seven main pressures that are not ranked. Simplified to key words, these seven are: (1) Climate change; (2) Fishing and harvesting; (3) Marine pollution; (4) Increased demand for marine space; (5) Underwater noise; (6) Interfering constructions; and (7) Non-native species [40] ch. 54. In alignment, this taxonomy of main pressures is roughly similar to what the IPBES report consider as the direct drivers on the global marine environment. These five direct drivers are: (1) Fisheries and other harvesting of marine organisms; (2) Change in area use on land and at sea, including development of

infrastructure and aquaculture in the coastal zone; (3) Climate change; (4) Pollution and waste; and (5) Invasive and alien species [41] p.105. The first direct driver (fisheries and other harvesting of marine organisms) is considered by IPBES as the one with greatest impact on the marine environment. Considering that the IPBES second direct driver (change of area use) include the sixth pressure of WOA1 (interfering structures), and since the fourth of IPBES direct driver (pollution) includes the fifth pressure of WOA1 (noise), these two sets of main pressures or direct drivers are roughly similar. These sets of main pressures or direct drivers are rough categories, which are certainly subject to debate. They are nonetheless based on scientific assessments, which is why this analysis relies upon them.

Biodiversity loss is not listed in any of the taxonomies, despite its importance and current alarming status [41] p.3. However, biodiversity loss is excluded due to the approach, which focuses on the environmental pressures on the marine environment rather than their impacts. Biodiversity loss is certainly important and likely to be a consequence of all the main pressures or direct drivers, yet remains beyond the focus of this analysis.

Further, beyond these lists of main pressures on the global marine environment, the confined area could be subject to regional and local pressures, dependent on its location. One example of a regional pressure not included amongst the aforementioned pressures is the eutrophication of the North West Pacific region [50] and the Baltic Sea [51]. Yet, for reasons of scope, regional dominant pressures not included amongst the aforementioned pressures are not included in the analysis. Local pressures are, to some extent, included. Some scholars include local pressures within a broader category of local stressors that include “two types: potential drivers of change (human activities such as fishery, shipping, mining), or pressures (such as pollution, human-induced introduction of alien species, change in predator density)” [[52] p.3, [53]]. The second type capture pressures broadly similar to those aforementioned pressures (which result from the aggregation of local pressures), thus they will not be discussed separately. In this analysis, the first type (human activities such as fishery, shipping, mining) are not included merely because they are present in the confined marine area, but in so far as they constitute or induce main pressure. Nonetheless, the mere presence of local activities constitutes a pressure on its own simply by the occupation of space. The aforementioned “increased use of space” pressure capture this aspect.

Last, the analysis will assess the compatibility of the totality of (or collective or cumulative) pressures on the confined area and the extent to which mitigating these pressures collectively is consistent with the scope of ocean management.

4. Compatibility of Pressures with Ocean Management

This section now analyses the extent to which reducing each of these environmental pressures falls inside or outside the boundaries of ocean management. Thus, the question is whether co-management of coastal communities, marine activities and marine spaces is a scope suitable to reducing or mitigating each of those pressures.

Based on the WOA1 and IPBES taxonomies in combination, and as the IPBES report identifies it as the top one with greatest impact, arguably the one main environmental pressure for a management regime concerned with protection of the marine environment, is fisheries and the harvesting of marine organisms. Is reducing this pressure compatible with ocean management: to co-manage fisheries with other marine activities, coastal communities, and marine spaces? It might immediately appear practical to manage a pressure stemming from one sector sectorally – as opposed to co-managing it alongside, for example, tourism and renewable energy production – in order to benefit from, for example, sectoral expertise. In practice, Scott highlights how “typically, fisheries management is

excluded from oceans policy at both the national and regional levels” [5] p.467, and Jansen et al. how “fisheries are usually not or not fully integrated into today's marine spatial plans” [54] p105.

Further, ocean management captures only parts of the available responses and mechanisms to reduce the pressure caused by fisheries and harvesting. The range of measures to mitigate this pressure includes direct regulation of fisheries, import and export regulation, but also market mechanisms (such as influencing demand through labelling, informational or educational means) including by international cooperation. As ocean management only includes citizens of the coastal communities of our confined marine area, it does not extend to markets and citizens beyond those coastal communities, to the larger community and state into which it is embedded. Nonetheless, one area-based approach relevant to ocean management does exist, which targets protecting the fish as opposed to managing fisheries. Where fisheries and other marine activities present in the confined area induce pressures on, for example, a vulnerable area such as a spawning or nursery area, area-based restrictions could be envisioned. An example of such measure is the Norwegian Marine Management Plans, where petroleum exploration is restricted in such areas in the Norwegian Sea [55] p.132-134. Area-based measures designed for this purpose, such as a marine protected area, could accordingly be relevant for marine activities beyond fisheries. If placed in the territorial sea or EEZ, area-based measures could be authorized by the coastal state. On the high seas, however, such measures demand a mandate by states over the relevant activities. In any event, area-based measures, relevant for fisheries and other marine activities, could be compatible with the scope of ocean management. Beyond such measures, reducing the pressure caused by fisheries and harvesting generally is more appropriately managed outside the scope of ocean management.

Beyond fisheries, most of the WOA1 main pressures and IPBES direct drivers do not stem solely from marine activities or do not concern marine space alone. Three of the direct drivers as per the IPBES report (change in area use on land and at sea; climate change; pollution and waste) and four of the WOA1 main pressures (climate change; marine pollution; increased demand for marine space; interfering constructions) stem from both land-based and marine activities. The question emerges of whether it is appropriate to consider reduction or mitigation of these pressures as caused by the marine activities, in combination within ocean management, thus separate from the land-based pressures and as opposed to taking a sector-specific approach. This is now discussed for each of these pressures.

Climate change is increasingly being included into marine management, and from multiple perspectives [[52], [43]]. Yet, the specific question here is whether mitigation of climate change suits the scope of ocean management. Some scholars claim that ocean management can help close mitigation gaps [[56] p.1372, [57] p.311] while others consider how marine spatial planning can support climate change mitigation “if properly considering the climate dimension” [43] p.4-5. Yet, in contrast, others emphasize how effective climate mitigation action requires different [than place-based marine ecosystem management] and international solutions”[13] p.350. In all likelihood, multiple approaches are relevant, yet the question is whether ocean management is one such appropriate approach. Under the perspective that any sector should mitigate or reduce CO₂ emissions, a sectoral approach guided by sectoral expertise is one appropriate approach. Yet, where sectors provide substitutional goods or services, such as food from the sea and food from land, sectoral approaches are appropriately complemented by cross-sectoral approaches. Some claim that ocean-based climate change mitigation “could contribute as much as 21% of the emission reduction required in 2050 to limit warming to 1.5°C and 25% for a 2°C target”, yet these “Ocean-based mitigation options must be accompanied by deep cuts in emissions across terrestrial GHG sources.”[58] p.4. Thus,

complementary approaches across the land-sea interface are relevant, yet also outside the scope of ocean management.

Further, scholars argue that ocean management could mitigate climate change by promoting the allocation of areas for renewable energy infrastructures or production [[43] p.6, [57] p.306]. Unlike the economic objective of facilitating new activities, if expansion of renewable energy shall lead to reduction of emissions, it must be embedded in an overall plan showing a carbon budget with declining emissions, for example, combining the expansion with the phasing out of fossil fuels used for energy [58] p.4. Such an overall plan on the composition (and consumption) of energy sources is outside the scope of ocean management as such a plan includes non-marine activities, citizens, and infrastructure beyond the coastal communities. Furthermore, Santos et al. argue that ocean management could mitigate climate change by prioritizing areas for eco-friendly use and restricting them for polluting activities [43] p.6. Yet, the appropriate level of prioritizing activities may not be between marine activities, but between sectors providing substitutional goods and services.

Furthermore, beyond emission reduction, “fundamental knowledge (...) [exist] to justify the inclusion of blue carbon protection, restoration and creation” [59] p.9 in climate change mitigation. Blue carbon is organic carbon that is captured and stored by the oceans and coastal ecosystems. Therefore, the confined marine area of ocean management provides potential for natural carbon sequestration to the extent that ocean and coastal ecosystems are protected, restored or created. To the extent that the restricting or banning of activities and expanding communities, such as through area-based measures, is done appropriately within the geographical boundaries of the confined marine area, there exists potential for this climate change mitigation approach in ocean management. If, however, such area-based measures are more appropriately planned for and implemented at a larger scale, such as nationally or by region, it extends beyond the marine and coastal area that is included in the scope of ocean management.

The next pressure to be assessed concerning compatibility with ocean management is pollution. Several types of pollution exist relevant for the confined area, such as toxic substances and plastics [40], many of which are transported over a long range. Management approaches to the reduction of pollutants entering the marine environment could target the design, production, import, export, and consumption of goods and services, and systems for reuse and proper waste management. Additionally, under the perspective that any sector should reduce waste and pollution to the extent possible, a sectoral approach guided by sectoral expertise could be complementary and appropriate. These approaches demand implementation at scales beyond ocean management. Nevertheless, some phases of the life cycles of pollutants may coincide with our confined marine area, as in the case of riverine inputs [60] or already accumulated waste. Approaching these could be relevant for ocean management.

The next pressures to be investigated in light of ocean management are those categorized by WOA1 as “increased demand of coastal and marine space” and “interfering constructions” and by IPBES as “change in area use on land and at sea, including development of infrastructure and aquaculture in the coastal zone”. To the extent that the coastal communities and marine activities induce such an increasing demand on the area, reducing this pressure could suit the scope of ocean management. The extent to which the demand and use of the confined area should be restricted (or transformed), and by which activity, concerns the co-management of marine activities, coastal communities and marine space, and is therefore a relevant topic for ocean management. To the extent that the pressure extends beyond our confined area and could be more appropriately co-managed with adjacent land or marine areas, if falls beyond the scope of ocean management.

The remaining main pressures or direct drivers result from marine activities. These are the two WOA1 pressures “underwater noise” and “distribution of non-native species”, and the last direct driver of the IPBES report (invasive and alien species), which is similar to the latter WOA1 main pressure. As per WOA1, the underwater noise stems from shipping, sonar, and seismic activities [40] p.2. The question remains of whether the shipping, sonar and seismic activities should be co-managed for the purpose of mitigating this pressure. As ship source pollution is subject to global scale standardization [61], it seems demanding to co-manage it with activities subject to state authority. Under the perspective that any activity should reduce the noise it generates, a sectoral approach relying on sectoral expertise is appropriate. If the goal is to ensure, for example, that the total level of noise in certain parts of the confined area does not exceed some tolerable level, ocean management could be relevant. Thus, establishing the tolerable level and “distributing” the tolerated noise between the activities, for example, through area-based restrictions, is compatible with co-managing marine activities and coastal communities for ocean management.

As per WOA1, non-native species are introduced in a large part through aquaculture, shipping, and marine debris [[40] summary p.32, ch. 12 p.13, ch. 16 p.34, and ch. 25 p.5–6]. Marine debris coincides with the pollution pressure, as discussed earlier in this section. Aquaculture and shipping induce this pressure in very different ways (such as escaped farmed fish vs. ballast water disposal), thus a sectoral approach seem more appropriate. Yet, as with the previous pressure, under the perspective that establishing a level of tolerability for all or parts of the confined area is reasonable, establishing the tolerable level and potentially restricting the activities so that they stay within the level could be envisioned as a relevant topic for ocean management.

The final pressure category to be discussed is the totality of pressures; thus, the question remains of whether reducing the totality of pressures on the confined marine area is consistent with the scope of ocean management. As the discussions so far has shown, only a selection of approaches to reducing or mitigating main environmental pressures is compatible with the scope of ocean management. Thus, a combined approach to these pressures is equally inappropriate with managing the coastal communities, marine activities, and marine spaces. Yet, behind each pressure are several indirect drivers that are more or less generic for all pressures. For example, IPBES categorizes values, demography, technology, economy, and governance as indirect drivers [41]. Targeting these fundamental issues underlying the pressures could lead to their mitigation and reduction, yet these issues seem more appropriately targeted beyond the scope of ocean management.

To summarize, this overall account has shown that the scope of ocean management is consistent only to a limited extent with mitigating main environmental pressures. Management efforts to mitigate or reduce many of the main pressures fall outside the ocean management scope. These are more appropriately organized by an approach that extends beyond coastal communities, co-management of marine activities, or marine spaces. Rather, sectoral approaches, approaches designed to the scale and characteristics of each pressure, or approaches targeting designers, producers, importers, exporters, markets, citizens or structures beyond coastal communities and marine activities are more appropriate.

The environmental pressures that ocean management could reduce or mitigate are the area-based measures relevant for the “increased demand of marine space” pressure. Moreover, area-based measures are relevant to the reduction of limited aspects of the other main pressures. Yet, it should be noted that authority over coastal and marine space, at least in regions of strong governance, is subject to sectoral and regulatory frameworks, including licensing and concession regimes that may leave little space for ocean management. In any event, the potential of ocean management to protect marine ecosystems is limited [[4], [62]].

5. A Brief Outline of Economic and Social Objectives

This analysis has focused on the environmental contribution of ocean management. Yet, it remains to emphasize that ocean management regimes are not just an environmental vehicle but embrace a threefold set of societal objectives, also including economic and social objectives. Further, it is “not possible to give equal priority to all aspects of sustainable development”[[63] p.8, [8] p.186] in ocean management. Some rather emphasize ocean management mainly as “vehicles for economic growth” [[9] p.9, [64]], although these vehicles still requires understanding ecological sustainability [64] p.625. Thus, a brief sketch of how contributing to economic and social objectives is consistent with the scope of ocean management will now be provided.

The economic objective could be understood as the facilitation of existing and expanding marine activities. Such facilitation requires economic actors’ physical access to marine areas and resources (such as for operation and infrastructure, and for a depository for emissions and waste products), which at least in regions of strong governance depends on sectoral and regulatory frameworks comprising, for example, sectoral concession regimes, safety standards, tax regimes, emissions and waste regimes. Unless sector-specific concession regimes are delegated to ocean management, physical access to marine areas are in large part outside the scope of ocean management. Facilitating activities also demands inter-sectoral distribution between activities (unlike actors) that roughly resembles concepts of multi-use [64] or integrated-use [18] p.261. The interactions that result from the use of the same area by multiple activities could be consistent with the ocean management scope [65] p.19. Some argue that “it may be impossible to characterize and quantify all the different interactions and subsequent tradeoffs between sectors.” [24] p. 361. For the specific ocean management regime, those interactions and tradeoffs should be specified to the extent possible, as they may comprise the main justification for ocean management. Other aspects of the economic objective, such as facilitating financial access (to make investments in infrastructure, production facilities, and equipment) fall outside the scope of ocean management. Thus, this overall outline indicates that some economic aspects could be consistent with ocean management, whereas others are subject to different regulation.

If social objectives are understood as meeting social (human) needs, they could include the rough sub-objectives as outlined by Raworth [[66], [9] p.10] that capture food and water, energy and housing, access to health, education, income and work, peace and justice, political voice, gender equality, and networks (roughly resembling “basic human rights of people” [23] p.142, yet different from discussing social dimensions through the use of concepts [23] p.142 and [67]). As the scope of ocean management includes only coastal communities, the social objective only captures the needs of these peoples. To the extent the coastal communities depend on marine or coastal resources for, typically, food, water and energy, income and work, these sub-objectives could fit with ocean management. Distribution of these or other resources between coastal and other communities fall outside the scope. Further, the remaining categories of health, education, peace and justice, political voice, gender equality, and networks are likely more appropriately are dealt with outside the scope of ocean management, for example, sectorally or organized under a larger regime such as a national regime [23] p.142. If more in-depth studies would support this brief outline, it could indicate that social objectives have a marginal place within ocean management, suitable only to specific topics for specific communities.

6. Conclusions and Outlook

This analysis has highlighted the limited scope of ocean management including the inherent property that it is premised on a geographically confined marine area. Yet, ocean management regimes are associated with high ambitions, most prominently environmental ones. Arguably, a core component

of the environmental objective is to respond to environmental problems or, as specified for the purpose of this analysis, to mitigate or reduce environmental pressures. The analysis concludes that ocean management is consistent only to a limited extent with mitigating main environmental pressures, thus its potential to protect the marine environment is limited.

This conclusion could question the relevance of ocean management, insofar as the scope is similar to that of this analysis, as a regime less important and less suitable to environmental objectives, which are more appropriately pursued by other approaches. If ocean management is your regime, then its likely environmental objective is some more restricted environmental aspects that could and should be exposed and explained. If the arguable core component of marine environmental protection that is to respond to environmental problems (unlike adapting to their impacts [62]) – is out-of-scope, this should be specified.

Further, the outline of economic and social objectives has questioned the limited relevance of ocean management. In any event, ocean management's potential to meet a threefold set of societal objectives is limited. Yet, the analysis has not focused on procedural aspects of ocean management. Kidd et al. explain the importance of process:

Related to this multiple integration ambition and the various challenges that result is the view that the MSP [Marine Spatial Planning] process may be more important than the output of MSP as such, not least with respect to issues related to fairness and representation. [68] p.2 (reference omitted).

The conclusions of this analysis have a bearing on these processes. The fairness and representation that those processes lead to is restricted to the scope. Thus, ocean management could provide for fairness and representation with regard to some area-based measures, relevant to some aspects of reducing environmental pressures, as well as certain economic and social aspects. Contrastingly, other efforts to respond to environmental pressures, to provide access to resources, and social distribution are subject to different processes.

Although specific questions relevant for ocean management certainly deserve attention, management, and research, the limitations in the scope and potential of ocean management is not always clarified. On the contrary, ocean management is often conceptualized as integrated [21] p.3, holistic [12], interconnected [22] p.352, or ecosystem-based (considering "the entire system" [23] p.142). These conceptualizations do not emphasize the inherent limitations of ocean management revealed by this analysis. Yet, the integrated or holistic dimension may implicitly refer to other dimensions. In any event, these concepts generally refer to a threefold set of environmental, economic, and social objectives or a combined objective such as sustainable development or sustainable ocean economy (and the "holistic range of strategic objectives that it should pursue" [9] p.9). This analysis concludes that not all problems or objectives are relevant for an ocean management regime.

Consequently, if ocean management is a pre-defined premise, attention should be paid to the specific framework into which it is embedded and the scope or mandate vested in it. Paying attention to these subject-matter boundaries could avoid leaving the impression of an ambitious regime beyond what it mandates.

If, however the predefined premise is societal objectives or environmental pressures, then these should arguably steer the choice and boundaries of one or more management regimes. A consequent question remains: What are the relevant management regimes for environmental pressures? This question demands analysis of environmental problems beyond the brief helicopter view analysis of this paper, targeting both individual pressures, common causes of these pressures, and how the global

capacity constraints [[44], [45]] could be managed by the multiple management regimes of the world. Arguably, these (non-marine) questions demand stronger focus from research councils, researchers, and decision-makers inside and outside ocean management.

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