



The transformation of the oceans and the future of marine social science

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Abstract

The oceans have become a juncture of great visions of blue growth as well as strong environmental concern. This paper discusses the essential role of the social sciences as the oceans increasingly emerge as a contested social arena. The marine social sciences have generated a vast knowledge about the development of fisheries and the implications of fisheries policies on coastal communities. We review this heritage and show that it makes the marine social sciences well qualified to address contemporary challenges raised by the increasing ambitions of exploiting and conserving the world's oceans. However, with the current transformation of the oceans as sites of comprehensive industrialization, captured in the concept of blue growth, we argue that marine social scientists need to rethink their research objectives. This requires a reflection on the lessons learned from decades of engagement with fisheries and fisheries policy to understand and intervene in processes and practices of modernization, science-based management, and privatization of resources. We suggest how the marine social sciences can provide new knowledge and actively engage in current developments by studying emergent processes in the marine environment, and the institutions, practices, and discourses that shape them. The social sciences have a responsibility to contribute to growth and conservation issues, and are in the capacity to do so, through formulating governance alternatives, anticipating future trends, imagining desirable futures, and facilitating socially just processes and outcomes.

Introduction

The oceans and coastal areas have been gaining increasing attention in recent years. In the Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, SDG 14 is dedicated to the oceans, seas, and marine resources (*Life below water*). This declaration emphasizes that the oceans are of vital importance to all life on planet Earth. They supply

nearly half the oxygen in the Earth's atmosphere, they are a major sink of CO₂, and they play a crucial role in the water cycle. Likewise, the oceans store and distribute heat and are an important source of biodiversity and a range of ecosystem services. Oceans also connect the different parts of the world, serving as a medium for maritime trade and transportation. Moreover, they provide marine resources that are essential for livelihood, nutrition, and food security for billions of people and offer recreation opportunities.

The growing awareness of the fundamental role of oceans for supporting life on Earth is reflected in two contrasting discourses, each with its own agenda. On the one hand, there is serious concern about the consequences of climate change and the future health and resilience of the oceans (United Nations 2017). Unsustainable fishing practices, pollution, and the millions of tons of litter that end up in the ocean every year—not least of plastics and microplastics (Haward 2018)—also endanger the marine ecosystems. In this perspective, our “sick ocean” is a key phrase that defines the discourse. The ocean is referred to as humanity's natural and cultural heritage, and focus is on the need to protect and restore the resilience and ecological integrity of the oceans.

On the other hand, there is the perspective shared by many that oceans are a new economic and development frontier. Exploiting the riches of the sea is at the core of the now almost

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ubiquitous discourse of “blue economy” and “blue growth”—terms that entered the international agenda over the past decade (Silver et al. 2015; Barbesgaard 2018; Winder and Le Heron 2017). The EU’s Blue Growth strategy, for example, refers to the seas and oceans as drivers for the European economy. Five sectors are given special priority: aquaculture, renewable energy, coastal and maritime tourism, marine biotechnology, and seabed mining (European Commission 2012). “Blue” growth, like its terrestrial cousin “green” growth, hints to the ambition of making economic growth environmentally sensitive and attentive to the health of ecosystems, but the strategies are primarily about further industrialization of the oceans and commodification of its resources (Wright 2015).

These two discourses, which portray the ocean as either a “park” or a “farm” (Wilson 2009: 170–171), seem to correlate with a scientific division of labor. Climate change, marine biodiversity, and the structure and functioning of ecosystems are central themes dealt with by marine natural scientists. Their objects of study range from ocean currents, temperature, and seawater chemistry to habitats, species, and populations, including their interactions and the effects of cumulative human pressures. In practice, the marine natural sciences appear as conservation sciences, underpinning a host of policy and management initiatives from local to global settings, with the establishment of marine protected areas (MPAs) as a preferred policy instrument.

In contrast, the discourse around blue economy and blue growth centers on entrepreneurship, technological innovation, multi-use offshore platforms, and new harvesting and cultivation strategies. Biologists can contribute to the extent that the projects are about exploitation of marine species, and economists can estimate the value of ecosystem services and provide cost-benefit analyses (Lillebø et al. 2017). However, the visions of blue growth mainly depend on engineers and technologists, who are able to come up with new development concepts for harnessing the potential of the ocean economy (OECD 2016).

In both discourses, marine spatial planning (MSP) is championed as a tool for the rational management of ocean spaces, marine and maritime activities, and the associated trade-offs (Douvere 2008; Ehler and Douvere 2009). Although planning is a social and political process (Kidd and Shaw 2014), the social sciences are not accorded a central role in either of the two discourses. Blue growth and conservation initiatives typically profess and welcome interdisciplinary approaches and even the inclusion of social science perspectives, but the social sciences tend to be reduced to an uncritical science of indicator development and social impact analysis. Yet, critical social science is needed insofar as growing interest in the ocean, encapsulated in the conservation and the exploitation agendas, is now turning the ocean into an increasingly important and contested social arena. While

society is moving offshore, the traditional boundaries between land and sea, and between society and nature, are blurred. In this paper, we discuss how the social sciences can engage with and intervene in the ongoing transformation of the oceans and contribute to discourses about sustainable development.

While others have similarly advocated for a strong social science presence and analytical voice in marine research and policy development (Hicks et al. 2016; Charnley et al. 2017), here we draw upon critical fisheries social science as a source of investigation. Fisheries social scientists have been engaged in research, consultancy, policy advice, and activism, which has given them a comprehensive perspective on how oceans policies and new practices in the name of conservation/economic growth emerge, are implemented, and, especially, impact on the well-being of both human communities and the environments upon which they depend. As we will show, emerging ocean discourses and practices echo those that have been prominent within fisheries science and management for a long time. As a result, the trajectory of fisheries policies and economies can be seen as prefiguring those emerging in today’s oceans. Concurrently, we stress the importance of both learning from experiences of fisheries social scientists and casting the analytical nets wider. The new ocean economy and its related governance frameworks and regulatory regimes are rapidly expanding, which means that marine social scientists also have to broaden the scope of their studies.

In the next section, we show that through the engagement with fisheries concerns, the marine social sciences have built a strong heritage that is crucial to critically reflect upon and intervene in today’s marine issues. We provide an overview of the objects of study that have concerned fisheries and marine social scientists in the past decades and thus describe how an applied, critical niche has developed to understand transformations in ocean and coastal economies, livelihoods, cultures, and social practices, primarily from a Northern European perspective. In the subsequent section, we draw upon this knowledge to propose critical themes for the marine social sciences today. Finally, we discuss two key concepts frequently applied in blue growth and conservation discourses—resilience and ecosystem services—and assess their potentials for reframing the relationship between nature and society.

The development of fisheries social science

The sea has since ancient time been used for navigation, fishing, and hunting, and there is a long social science tradition of studying fisheries and fishery communities in the Global North as well as in the Global South. Starting with, among others, Malinowski’s account of the Argonauts of Western Pacific (1922), the early contributions of the social sciences to understanding fisheries consisted primarily of anthropological and ethnographic studies of fisheries communities and

livelihoods (for example Barnes 1954; Tunstall 1962; Barth 1966). These early studies showed that fishing activities are socially embedded and shaped by institutions and networks deeply ingrained in each society. This has been a key insight of the social sciences ever since.

The tension between marine conservation and exploitation also has a long history. The International Council for the Exploration of the Sea (ICES) was founded in 1902, partly due to a concern for the decimation of the fishery resources in the North Sea. Since the mid-twentieth century, efforts to modernize the fishing industry have been accompanied by an increasing awareness of the risk of over-exploitation and degradation of commercial fish stocks. Marine and fisheries biologists tried to strike a balance by developing models of the dynamics of exploited fish populations (Ricker 1954; Beverton and Holt 1957), which laid the foundation for fish stock assessments and the determination of maximum sustainable yield (MSY). Fisheries economists included the economic aspects of harvesting and promoted the concept of maximum economic yield (MEY). Based on bio-economic models, they sought to stipulate the level of effort that would create the largest difference between total revenues and total costs of fishing (Gordon 1954; Scott 1955; Schaefer 1957). In general, both economists and biologists were strong advocates of an industrialization and rationalization of the fishing industry, but the invention and implementation of MSY, and the bio-economic discourse as such, were early attempts to posit economic maximization along with conservation goals. Thus, the environmental crises in fisheries prefigured that of the oceans generally; as sites where “planetary boundaries” have been reached (Rockström et al. 2009) and where fundamental changes are called for in resource utilization, property regimes, and governance frameworks, preferably by replacing open access with private property rights.

During the 1960s and the 1970s, the modernization efforts got under fierce attack from many corners. In the Global South, a number of development projects were characterized as failures, only serving the interests of the elite at the expense of the majority of the fisheries-dependent population (Alexander 1975; Lawson 1977; Kurien 1978). Similar criticism was raised in developed countries, where the industrialization policy was perceived as a threat to local communities and rural settlements (Brox 1966). At the same time, it became apparent that several fish stocks were about to be extinct, and throughout the world, environmental protection entered the political agenda. Hardin, in his article about the *Tragedy of the Commons* (1968), highlighted how common pool resources risk being exhausted when all actors pursue their own interests.

Social scientists were largely critical of the overall modernization program. One strand of research focused on fishing communities, livelihoods, and local coping strategies. Jentoft and Wadel (1984) coined the concept of “employment

system” to describe the network of mutual dependencies between fishers, their families, and the local communities, including fish processing plants, schools, shops, and voluntary associations. Mobility and recruitment studies shed light on the robustness of the local employment systems (Sønvisen 2013). Another strand of research concentrated on the historical development and organization of the fisheries sectors and the fisheries policies of different countries. This has been a recurring theme since then (Hallenstvedt 1982; Holm 1995; Apostle et al. 1998).

The Law of the Sea Convention and the introduction of 200 nautical miles Exclusive Economic Zones in 1982 represented a watershed (Holm 1996). The coastal states now gained jurisdiction and management responsibility for much larger areas and their associated marine resources. In the wake of this, three major changes occurred. First, the nationalization of resources gave a boost to the international trade in fish and thereby to the globalization of the fishing industry. Second, resource management emerged as a key issue in the fisheries policy of all countries with industrialized fishing, leading to the institutionalization of quota-based management. Third, spurred by the general liberalization of the world economy, a variety of market-based reforms was implemented in the fisheries sector.

These developments set the stage for the marine social sciences, which also adopted new and more critical approaches through the 1990s, inspired by, among others, political ecology, post-structuralism, and feminism (St. Martin 2001; Mansfield 2004). Studies were devoted to the globalization processes, power distribution in value chains, and consequences for fisheries-dependent communities (Jentoft 1993; Arbo and Hersoug 1997). Similarly, political scientists delved into the EU Common Fisheries Policy (CFP) and the rise of international regimes regulating fishing activities and seafood trade (Holden and Garrod 1996). The increasing element of resource management also broadened the scope of government regulation and control, now encompassing fish stocks, fishing activities as well as landings (Crean and Symes 1996). Expert advice started to play an increasingly large role, notably in the form of assessments of fish stocks and biomass as an input for the determination of total allowable catch (TAC) and the allocation of quotas. Hence, the science-policy nexus and the centrality of natural scientific knowledge in the design and implementation of fisheries management instruments became the objects of study in a strand of research inspired by STS (Holm 2001; Hauge et al. 2007; Schwach et al. 2007; Nielsen 2008; Wilson 2009). Another line of work dealt with the institutional development and implications of rights-based management. This has resulted in elaborate contributions on the architecture of quota regimes and their implications for societies (McCay et al. 1995; Hersoug 2005; Johnsen and Jentoft 2018).

During the 1990s, the social sciences were particularly engaged in refuting Hardin and questioning the system of individual transferable quotas (ITQ) that was promoted by

economists (Eythórsson 1996; Symes 1997). Following Ostrom's (1990) seminal work on governing the commons, many social scientists sought to identify and analyze institutional arrangements in which user groups and public authorities managed marine common pool resources in common, based on shared responsibility (see Symes and Hoefnagel 2010). The examples were taken from all over the world, which brought increased attention to small-scale fisheries, the plurality of legal and institutional frameworks, and the issues of poverty and marginalization. Jentoft (1989) introduced the concept of fisheries co-management (see also Jentoft and McCay 1995), which rapidly shaped the global research agenda. Stakeholder participation, key to co-management, was defined as conditional for the development and implementation of legitimate and effective management instruments and procedures. Since then, research has reflected critically on how stakeholder participation is organized, how it delivers contributions, and how such processes can be (better) organized for acceptable outcomes (Sen and Raakjaer Nielsen 1996; Jentoft et al. 1998; Gray 2005; Bavinck and Gupta 2014).

In the new millennium, novel research themes and approaches emerged and partly supplemented those already mentioned. Overall, the marine social sciences have seen a shifting focus from management to governance (Kooiman et al. 2005; Jentoft 2007), acknowledging that steering includes complex multi-actor systems with many interactions (Symes 2006). Likewise, the limitations of scientific advice, and the increasing focus on stakeholder participation for socially robust knowledge production has become a key theme (Linke and Jentoft 2014; Mackinson and Wilson 2014). Combined with the call for stakeholder participation, there has been a reevaluation of local or traditional ecological knowledge in designing more effective and legitimate governance measures (St. Martin and Hall-Arber 2008; Brattland 2013). Aquaculture, which accounts for an increasing share of global seafood production, has also attracted more attention from social science, and focus has partly shifted from managing fisheries to managing coastal zones and ocean areas with their multiple activities and interests involved (Johnsen and Hersoug 2014).

Hence, over time, fisheries social science developed and widened in terms of both topics and approaches (Urquhart et al. 2014; Bavinck et al. 2018). With roots in fishing communities and common property dynamics, fisheries social science learned to “look up” and study these issues relative to larger institutions, management systems, regional economies, and knowledge hegemonies. Yet, fisheries social sciences remain dedicated to revealing how such larger processes play out locally. The combination of critical social science approaches—studying not only emergent processes in the marine environment, but also the practices, enactments and discourses that shape them—and years of struggling to understand and intervene in processes and practices of industrialization, enclosure, privatization, commodification, and

marginalization, make marine social scientists well qualified to address contemporary concerns.

Extending critical research on ocean transformations

While the focus on fisheries has been important, it is obvious that the issues of blue growth and sustainability, which today dominate the international agendas, place new demands on marine social scientists. They can build on their heritage from decades of fisheries research and apply the same approaches, concepts and methods, but need to extend their vision and scope. In this section, we therefore propose five themes that we consider important to follow up and critically address in the years ahead.

The blue growth agenda is oriented at industrial development and technological innovation, encompassing new energy production, aquaculture, tourism, and other industries. Hence, it is vital to focus on the dynamics of new industrial developments and their social implications. This is a first major theme. Studies of transformations in fisheries—as a frontier for modernization, economic expansion, and exploitation of new resources—have prepared the marine social sciences to critically examine the rise of new industries and their exploitation of resources. Such studies provide insights into the actors involved, their strategies and interests, the alliances and coalitions built to support developments, and how these (re)shape relationships in the marine realm. As these processes are based on and mediated through technology, the transformative role of technology is an important aspect to consider. Just like the introduction of trawlers and freezing technology reshaped relationships and power constellations along coastal areas in the past (Robinson 1996; Finstad 2004; Kolle et al. 2017), current rapid progress in fields as varied as remote and unmanned vessel operations, robotics, aerial and submarine surveillance systems, communication technology, and energy generation and transmission will transform the ways in which the ocean is used and known. A key to an understanding of the transformation of the oceans is therefore attentiveness to the dynamics of industrial development, in order to comprehend the wider social effects of these new economies.

Based on insights into the dynamics of new marine sectors, a second theme concerns the processes, practices, and discourses around the privatization and financialization of ocean space and resources. How are such processes linked to the establishment of, for example, new aquaculture farms or offshore renewable energy projects? There is reason to expect that investors will demand a stronger long-term security for their assets. The same holds when operators have paid a lot for licenses, quotas, and dedicated vessels or equipment. How do such processes of privatization and financialization work out in practice, and what are their unintended consequences? There is a fear that new

capital-intensive actors “push out” the more traditional, often smaller scale users from their spaces, a process that is referred to as “ocean grabbing” (Bennett et al. 2015; Barbesgaard 2018; Knott and Neis 2017). While such dynamics between modernized and traditional users have been studied extensively in fisheries contexts (Jentoft 2017), these conflicts may play out in different ways in the blue economy.

A third theme for marine social science research is the governance frameworks that regulate new industries in the marine environment. Such research can draw extensively on general governance theory, studies of fisheries governance (Kooiman et al. 2005; Bavinck et al. 2013), as well as recent contributions on integrated marine governance (van Leeuwen and van Tatenhove 2010; van Tatenhove 2011). While integrated marine governance is complex in the context of national policy frameworks, the design and implementation of such arrangements at regional (e.g., EU) level takes place in even more complex governance arrangements in which many more actors, interests, viewpoints, legal frameworks, policy contexts, and knowledge bases have to be taken into account. Further research should look into how such frameworks are designed institutionally and how they connect different legal arrangements and policy contexts. Furthermore, focus should be on the governance instruments that are deployed, and their outcomes in terms of rules, norms, and shared conceptions (Lascoumes and Le Galès 2007; Knol 2011; Song et al. 2018).

A fourth theme for the social sciences is to explore more thoroughly the role of knowledge production in advancing and governing sustainable blue growth. There are different forms, types, and formats of knowledge that provide the basis for marine governance. With the turn towards more integrated policy frameworks, this knowledge is incorporated into information infrastructures that are increasingly complex and collaborative. Whose knowledge is considered in such infrastructures and how do processes of selection and prioritization of certain forms of knowledge over others influence decision-making and development patterns? What role is there for forms of knowledge other than scientific knowledge, such as traditional ecological knowledge? The social sciences can deliver further insights into the possibilities and limitations of integrated and participatory knowledge production (Mackinson and Wilson 2014; Röckmann et al. 2015), and scrutinize how knowledge supporting the various pillars of sustainable development is assessed, prioritized, and translated into governance (Clark et al. 2016).

As a fifth theme, studies into knowledge practices will also result in deeper understanding of the contents and implications of ecosystem-based management (EBM), which is propagated as a useful management philosophy in sectoral and cross-sectoral contexts, taking into account all the interactions within an ecosystem as well as the cumulative human impacts on marine environments (Curtin and Prellezo 2010). While there have been many social science studies on the implementation

and development of EBM frameworks recently (e.g., Knol 2010; Arbo and Thùy 2016; Sander 2018), there are several issues pertaining to EBM that require further scrutiny. How are external pressures on the marine environment, such as climate change and pollution, taken into account in designing frameworks for EBM and how do these enable or constrain the development of new activities? Which systems are developed to measure and monitor environmental conditions and the cumulative effects of human impacts (Knol 2013)? To what extent, and how, are such measures standardized across policy contexts? Are they linked to clear objectives and intervention thresholds?

Another central concern relates to marine spatial planning (MSP) as a means to implement EBM in practice. MSP has the ambition to facilitate increased exploitation of marine resources and spaces while effectively resolving use conflicts and protecting and restoring environmental wellbeing, endangered species, and functioning ecosystems (Jay 2018). Here, the perspectives of conservation and blue growth merge within a discourse of discrete stakeholders, rationally ordered access to resources, and exclusionary rights. The salient question is what this means in practice. How and to what extent are conflicts resolved? What types of synergies are achieved and who are privileged by the new rules of the game (Flannery et al. 2016)?

To sum up, in the context of blue growth and conservation, the marine social sciences must continue to shed light on the social, cultural, and economic impacts of climate change, ocean industrialization, and other anthropogenic pressures that affect coastal areas and communities (Reusch et al. 2018). As these processes typically interact with and amplify each other, it is important to study how they affect infrastructures, livelihoods, income inequalities, human health, and life prospects of different social groups, and what governments, civil society, the business sector, and dedicated international organizations do to reduce uncertainty and vulnerability.

Bridging old divides

In addition to the five themes outlined above, the discourses around conservation and blue growth raise more fundamental issues about the relationship between nature and society. These issues are of great importance to the marine social sciences, which thematically operate in the fuzzy border zones between nature and society, sea and land, and conservation and exploitation. “Sustainability” has become a mantra in natural resources policy and management worldwide, with its aim to establish and maintain a harmonious relationship between humans and nature and reconcile nature conservation and economic growth. However, it is becoming increasingly clear that we live in a world where human impacts on the environment are substantial and adverse. Climate change and the new notion of the “Anthropocene” emphasize how

humanity has become a geological agent on planetary scale, interfering with the functioning of the Earth as a whole (Steffen et al. 2015).

This has led to a questioning of the old distinction between nature and society, where society has conventionally been perceived as made up of intentional actors, social structures and relationships, and associated meaning systems. This idea has received fierce criticism over the last decades, as it treats society and human culture as separated and elevated from the natural world, and leaves technological artifacts and material infrastructures out of sight (Latour 2005). Instead, attention is drawn to the entanglements of humans and other living and non-living entities and their distributed agency. New concepts and approaches are launched to better grasp this complex interaction. Here, we will discuss the concepts of “social-ecological resilience” and “ecosystem services,” which are of particular relevance to the marine social sciences. Both introduce a new, interdisciplinary language for dealing with the intertwined relationship between nature and society, and both have gained increasing popularity in recent years.

The concept of resilience has been applied in various theoretical fields (Bonß 2016), but one important context is ecology, starting with Holling’s 1973 essay on *Resilience and stability of ecological systems* (Holling 1973). From modeling of ecosystem behavior, resilience has evolved into a widely used concept in the study of social-ecological systems (SEs) (Berkes et al. 2000; Folke 2006). In SEs, socio-economic systems are placed within the biosphere or the Earth system, where social and natural systems are considered as coupled, self-organizing, and co-evolving systems. Resilience is often understood as “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedback” (Walker et al. 2004). It builds on knowledge of ecosystem dynamics for dealing with external change and requires the development of adaptive management practices and flexible institutions and social relations in order to measure, interpret, and respond to ecological feedback (Hughes et al. 2005). Hence, theoretical links are made between the natural and social science disciplines, based on concepts such as complexity, non-linearity, tipping points, and multiple equilibria.

The notion of resilience can be a useful point of departure for analyzing disruptive processes and how these can be handled in successful ways. Resilience is closely linked to other notions such as risk, vulnerability, and adaptive capacity (Gaillard 2010; Lorenz and Dittmer 2016), and it can be used to identify factors that enable social groups, organizations, societies, or social-ecological systems to deal with threats and to regain stability. However, resilience thinking has been criticized for its simplified view of society and its lack of typical social science concepts to understand transformations, like power, agency, knowledge, conflict, and inequality (Olsson et al. 2015). While the resilience approach typically

aims to prevent transitions and focuses on the ability to “bounce back” and return to some “normal” state of the system, social theory usually analyzes resistance to change in order to stimulate dynamic transformations. Olsson and colleagues (Olsson et al. 2015) argue that the notion of a system in social-ecological theory is inadequate from a social science point of view. It has also been discussed whether resilience is an inherent property of a system, a continually changing process, or an emergent effect when systems are confronted with disturbances and stress (Davoudi et al. 2012; Bonß 2016). Others see resilience as an approach that normalizes catastrophes and disasters, making them a normal part of ordinary life and leaving the responsibility to those who are affected (Hall and Lamont 2013). Hence, while the resilience discourse today seems widely adopted to construct a common language, social scientists are tasked to indicate the opportunities and constraints of applying an ecologically rooted concept to social settings, to ensure that social dynamics are made visible and taken into account.

Another discourse that attempts to bridge the gap between disciplines is that of ecosystem services, which takes a prominent place in blue growth debates (Mulazzani and Malorgio 2017). While origins of the concept of ecosystem services can be traced back to the 1970s (Gómez-Baggethun et al. 2010), it gained popularity through the Millennium Ecosystem Assessment (MEA) (2005), which defined 31 ecosystem services in four different categories (supporting, provisioning, regulating, and cultural services). The MEA takes an anthropocentric, utilitarian approach to ecosystems by defining their services as the benefits people obtain from them. The ecosystem service approach is now widely propagated by economists, business actors, and policy makers and assumes that key use and non-use services of an ecosystem can be identified and valued in monetary terms. Such a valuation of services is increasingly considered to be at the basis for the prioritization of blue economy options (Mulazzani and Malorgio 2017).

Like the resilience approach, the ecosystem services approach helps bring in new perspectives. Environmental costs, previously treated as negligible externalities, are now made part of a more comprehensive calculation, where ecological values are highlighted (Norgaard 2010). The basis for cost-benefit analyses has thereby been expanded and improved. However, the price for doing this is that nature is economized and defined as capital. So even though the focus on monetary valuation may raise support for conservation, the ecosystem services approach promotes a commodification of natural resources and the extension of a market logic (Gómez-Baggethun et al. 2010). In the context of Blue Growth, it could be argued that the very concept of ecosystem services is linked to an agenda that presumes limitless growth (Hadjimichael 2018). When payment for ecosystem services is introduced and ecological phenomena are made comparable and replaceable, new domains are colonized by well-known

unsustainable capitalistic practices (Barry 2012). This means that monetarization and payment for ecosystem services represents a dubious, if not paradoxical, conservation strategy (Redford and Adams 2009; Norgaard 2010). It has also been pointed out that ecosystem service valuation pays little attention to the historical and cultural context, to governance and legal perspectives, as well as to the problems of representing the great diversity of views and value system among multiple stakeholders (Fish 2011; Ernstson and Sörlin 2013).

It is clear that concepts like resilience and ecosystem services are designed to develop a common language across groups of actors and establish new relationships between nature and society. They have rapidly made their entry into mainstream scientific and political thinking. Both concepts have also received ample criticism as demonstrated above, especially with respect to their limited account of social issues and—concerning ecosystem services—their embeddedness in capitalist ways of thinking and organizing society. When implemented, there is a fear that the social components of ecosystem services and resilience approaches are narrowly defined and designed to plug into existing management practices and policy models, avoiding broader discussions about social issues such as rationality, power relations, institutions, class, inequality, and social justice.

While the marine social sciences can deliver important contributions by critically reflecting upon their construction, implementation, and consequences, and how these new “technologies of globalization” (Ernstson and Sörlin 2013) are enacted in local settings, these discourses also provide opportunities for active engagement and intervention in the design of management approaches.

Conclusion

Through the past decades, the marine social sciences have developed a vast knowledge about the development of fisheries, the social embeddedness of these activities, nature-society entanglements, and the complex interaction of processes at many levels, spanning from the local to the global. These insights and the critical approaches that have been applied in the context of fisheries, are highly relevant to the wider agenda raised by the UN Sustainable Development Goal 14 and the visions of conservation and blue growth. In this paper, we have discussed the role of social science in blue growth as a metaphor for the rapid transformation of the oceans due to their large expected potential to spur sustainable economic growth, create jobs, provide food and energy, and even reduce poverty. This implies a double-sided movement. On the one hand, through the extension of land-based growth policies, society is moving out to sea through processes of ocean industrialization and the privatization and marketization of its resources (Knott and Neis 2017; Soma et al. 2018). On the

other hand, the ocean and all its burgeoning conflicts are increasingly integrated into mainstream politics on land.

A critical focus on blue growth and sustainability requires a widening of scope of the marine social sciences to include more sectors, actors, and cross-scale linkages, and to pay increasing attention to the implications of new governance frameworks and technologies (Ehlers 2016). The marine social sciences, as shown in this paper, are well positioned to capture these processes and the transformations that are taking place, through scrutinizing current developments and contributing critically to sustainability discourses (Boucquey et al. 2016; Winder and Le Heron 2017; Bavinck et al. 2018). In the same way that social scientists engaged with fisheries policy across a range of sites—struggling to change it (Jentoft 2014)—so should they engage critically with blue growth initiatives. Since sustainable development is fundamentally about societal transitions, there is a central role for the social sciences in the formulation of governance alternatives, the anticipation of future trends, the imagination of desirable futures, and the facilitation of socially just processes and outcomes (Bennett et al. 2017).

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