



Regulating marine bioprospecting. Exploring the establishment of new regulatory regimes in the blue bioeconomy

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ABSTRACT

This article addresses the dynamic and contested processes of establishing new legal arrangements in the marine bioeconomy, and spatio-legal aspects of establishing a rights system for marine bioprospecting in Norway is explored. There are great expectations from authorities and researchers that marine bioprospecting can have major effects on future economies, through innovations that would lead to producing medicine as well as food, fodder, cosmetics and other products. Vital to this process are questions regarding rights to access, collect and utilise resources, and the sharing of costs and benefits, which are potentially high at both ends of this spectrum. Currently, a state driven process aims to better regulate and control bioprospecting within areas under Norwegian jurisdiction. The present paper examines the challenging process of establishing such regulatory framework where actors struggle to gain discursive hegemony by obtaining legal backing for claims to genetic resources in the Norwegian littoral. Four discursive arguments are discerned and it is argued that knowledge and understanding about these discursive processes is of vital importance when policies for the future bioeconomy are shaped. Rights systems developed within the hegemonic discourses might 'lock' sectors in the bioeconomy into certain development pathways that have consequences for the potential value of the bioeconomy as an asset for the society as a whole.

1. Introduction

The ocean is currently about to be 're-discovered', attracting stakeholders previously unconcerned with marine areas. Although extensively used and utilised for a range of purposes throughout human history, the ocean is still in many situations perceived a 'no-man's land' with resources 'free' and ready to be identified and appropriated – virtually like a *Mare Nullius*. But who should benefit from the unknown and unowned resources in the sea? As oil will be gradually phased out, the bioeconomy has been highlighted as Norway's 'new oil'. In the Norwegian Government's recent bioeconomy strategy, *Familiar Resources, Undreamt of Possibilities* (Ministry of Fisheries and Coastal Affairs, 2009) it is stated that the transition to a bioeconomy should lead to increased value creation and employment, and further that the authorities should have a role in ensuring adequate regulations and adjustments for different types of marked failure. The bioeconomy is developing in a changing societal, institutional and technological context where established regulatory, as well as cultural, systems are challenged. Societal transitions thus influence valuations and utilisations of bioresources. In order to facilitate this change to a greener

and prosperous society, as the Government ask for, we need understand the negotiation of access, use and benefit-sharing of resource utilization in a dynamic system in which formal and informal institutions, business innovation, policies and management unfold.

There is a range of strategies and other policy documents that point to the importance of exploring and utilizing marine bioresources (e.g. Ministry of Fisheries and Coastal Affairs, 2009; Ministry of Trade Industry and Fisheries, 2016). Large multidisciplinary research projects are funded to explore unknown resources in the oceans, and in an article in the research magazine *Gemini* published by the Norwegian University of Science and Technology in Trondheim (Gemini, 2016), the leader of a research cruise in the Arctic Ocean notes that:

We feel like the marine version of Indiana Jones. (...) Every time we stick our heads into the water, we find new things.

Some of the things that these researchers find are genetic resources from various creatures living in the oceans. Marine bioprospecting is the process of discovering, analysing, processing and commercialising genes or biomolecules from bacteria, algae or animals in the ocean or at the ocean floor. There are great expectations from authorities and

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researchers that marine bioprospecting can have major effects as part of Norway's new oil, through research and the production of medicine as well as a number of other useful commodities. In Norway, marine bioprospecting is regulated by the Nature Diversity Act and the Marine Resources Act, with both stating that the resources in the ocean belong to the public. However, none of the acts provides a detailed framework respecting access rights, how to utilise potential discoveries, and how cost/benefit sharing should be organized in practice. The Norwegian government formulated a strategy on Marine Bioprospecting in 2009 (Ministry of Fisheries and Coastal Affairs, 2009) where they made clear that this sector would be important for the post-oil Norwegian welfare state and, as stated in the title of the strategy, "a source of new and sustainable wealth growth". Further the strategy pointed out that a legal framework for marine bioprospecting was necessary. At present Norway does still not have a functioning regulatory system for accessing, managing and sharing benefits from marine bioprospecting (see also Rosendal et al., 2016; Tvedt, 2013; Tvedt et al., 2016). However, in the wake of the abovementioned strategy, the Norwegian government initiated a process aiming to better regulate and control bioprospecting, and started to work towards establishing regulations with respect to bioprospecting under the Nature Diversity Act and the Marine Resources Act (see Tvedt, 2013). But this process has been a lengthy one, and it has proved to be very complicated, involving conflicting interests and activating moral and juridical dilemmas (Flemsæter et al., 2020).

The aim of the present article is to analyse the process of establishing a Regulation for bioprospecting in Norway, and to discuss how bioeconomic transition and its discursive power struggles influences longer term legal as well as normative arrangements of the bioeconomy, and consequently its role in the future society.

2. Framing the repurposing of marine resources

Due to previously limited knowledge or technology, many of the marine genetic resources now the focus of attention are resources that have been ignored and therefore, not necessarily covered by current legal systems. In the early 21st century, however, as part of a bioeconomic transition, we observe increased interest in, and a repurposing of, these marine resources involving a range of actors, sectors and perspectives. And as the philosopher and political scientist Crawford M MacPhearson has stated, "rights are always related to the purposes people see in resources, and when purposes change, property and rights becomes controversial" (Macpherson, 1978). Rights to resources encompass the capacity to exclude other groups or individuals also wishing to utilise or benefit from the same resource. Those who have power over this delineation are likely to try to stabilise ownership and rights to secure their control over the resources, and hence their possibilities for capital accumulation (Brown et al., 2019). New perspectives to marine bioeconomy challenge and destabilise established formal and informal regulatory frameworks, and it is a multi-sector transition that requires us to look beyond technology-driven transitions to wide-scale societal transitions and socio-technical regimes (Hansen & Bjørkhaug, 2017). A socio-technical regime refers to "the semi-coherent set of rules that orient and coordinate the activities of social groups that reproduce the various elements of socio-technical systems" (Geels, 2011, p. 27). Such a set of rules, accounting for stability of the system (Geels, 2005), can be formal and/or informal regulations, and shared beliefs and valuations of what is normal, appropriate, right or wrong. Socio-technical transitions occur when a societal need changes fundamentally, and such transitions force us to consider the way in which natural resources are accessed and shared and hence, how they destabilise existing rights systems, which activates both legal and moral considerations (e.g. Brown, 2007). Path dependency and lock-in processes are crucial mechanisms accounting for stability in societal transitions (Geels, 2011; Mahoney, 2000; Smith et al., 2005), and these are also mechanisms that are likely to be at work when rights to and benefits from natural resources in the bioeconomy are (de)stabilised and negotiated.

By studying the workings of cultural understandings and social relations with respect to particular units of resources, the dynamism of seemingly static legal arrangements is revealed (Blomley, 2004; Braverman et al., 2014; Delaney, 2003). The key to the legal geography literature is the "where" of law and "how" law happens (Braverman et al., 2014). This theoretical lens has helped understanding contemporary struggles and negotiations over the exploitation of natural resources and the ways legal as well as moral practices shape, and are shaped by, natural resource use and utilization. Since legal geography emerged as field more than two decades ago (see Blomley, 2004), this body of literature has grown into a wide variety of literature teasing out the range of relationships between law and space (see; Bartel et al., 2013; Braverman et al., 2014; Holder and Harrison, 2003). Legal geography scholarship has provided insights to how legal systems produce, re-produce and legitimize spatial power relations, which in turn shapes public policy aiming to regulate the material environment (e.g. Graham et al., 2017; O'Donnell, 2016, 2019; Robinson and Graham, 2018). Exploring ways in which law and space are mutually co-constituting, these scholars have demonstrated how and spatial justices and injustices are mediated through the nexus of law making practices and space (e.g. Brown et al., 2019; Delaney, 2016a, 2016b; Graham, 2011; Robinson and Raven, 2017).

Although geographers have contributed to humanistic and social science ocean studies for a while (e.g. Anderson and Peters, 2014; Steinberg and Peters, 2015), the field of legal geography has, however, mostly overlooked questions pertaining to the oceans and their governance and territorialisation. This might begin to change, as it has recently been argued that legal geographers are well positioned to contribute to this growing body of literature with their perspectives on the relationships between law, society and materiality (Braverman, 2018; Johnson and Braverman, 2019; O'Donnell, 2019). The prominent legal geography scholar, Nicholas Blomley, has in several publications during the latest decades demonstrated how "property is not a static, pre-given entity, but depends on a continual, active 'doing'" (e.g. Blomley, 2004, p. xvi). Territory, Blomley further claims, can be understood as a "bounded meaningful space governed so as to organize and regulate access", and both property and territory are "social institutions that organize a set of relations between people, in more or less exclusive ways, drawing from institutional resources of the state" (Blomley, 2019, 234). This is supported by Brighenti that argues that it is better to conceive territory as an act rather than an object or physical space, "generated" by the heterogeneous "ensemble of subjects and agents who form it by inhabiting (territorializing upon) it" (Brighenti, 2010, 68). Brighenti want us to draw attention to the role that acts of inscription play in the forming of territory. It could be useful to employ these perspectives to help us understand governance processes and the current repurposing of ocean resources. The vast areas are continuously revalued according to wider changes in society and subsequently, rights are enacted, or attempts are made to do so, in accordance with revised valuations. What is considered to be a morally acceptable claim to a particular resource determines the purpose of rights in particular areas and over particular resources. Individuals or groups can only successfully create and constitute territory and enact rights to their material resources if there is moral as well as legal backing for their claim (Blomley, 2004; Brown, 2012; Flemsæter and Setten, 2009). The process of obtaining such legal backing for claims to genetic resources in Norwegian ocean areas is what will be examined in the present article.

3. Bioprospecting – discourses and transitions

Bioprospecting is not a new phenomenon. The search for valuable biological material has probably just as long a history as humans themselves. Although an ancient activity, bioprospecting gained renewed and increased attention during the 1990s as pharmaceutical companies, driven by technological innovations, shifted some of their attention from chemical oriented processes to nature itself as a source

for medicine development (Svarstad, 2002, 2003). In addition to medicine, bioprospecting can also be valuable for food and fodder products, as well as cosmetics (see e.g. Paterson and Nelson, 2017). Along with this increased attention on bioprospecting, a number of issues have been raised pertaining to rights to access and utilise these resources. These include, for example, to what degree these genetic resources are part of a commons, to what extent private interests should be entitled to commodify material and immaterial resources based on genetic material and if and how benefits from such commodifications should be channelled back to the public (e.g. Dahlin and Fredriksson, 2017; De Lucia, 2019; Fredriksson, 2017; Hayden, 2006; Jørem and Tvedt, 2014; Lucchi, 2013; Paterson and Nelson, 2017; Rosendal et al., 2016; Tvedt et al., 2016).

An example often referred to in Norway is the representative from a Swiss pharmaceutical company who collected soil samples from Hardangervidda, a mountain area in Norway, while he was visiting the country as a tourist. After analysing the samples, it transpired that it contained a fungus where it was possible to isolate the active substance *cyclosporine A*. With this material basis and the knowledge and economic resources that the pharmaceutical company had, a drug that prevented rejection of transplanted organs was developed. In 1997, the Swiss company that obtained the rights to this drug developed from genetic resources extracted from Hardangervidda had a turnover estimated at US\$1.2 billion (Svarstad et al., 2000). This example demonstrates a range of factors that makes bioprospecting challenging to control and regulate: (1) There are potentially large economic benefits; (2) the geographical location of valuable resources can be random; (3) the material resource might not need to be harvested since the valuable components can be reproduced in a laboratory based on only one sample; (4) expenses and income can be connected to both material and immaterial resources; (5) it might take vast economic and financial resources to commercialize the product; (6) there does not have to be a connection between where the resource is collected and where it is commercialized; and, (7) it demands specific knowledge to explore and utilise the genetic resource's potential. However, it is important to note that marine bioprospecting, at the center of attention in this article, can be much more cost-intensive in terms of collecting genetic resources from oceans than doing so as in the example cited above, with land environments.

Since bioprospecting has gained increased commercial as well as political and academic interest during the 1990s, there have been two main and conflicting discourses of bioprospecting (Castree, 2003; McAfee, 1999; Svarstad, 2003). Discourse can be seen as an assemblage of ideas and understandings, and a particular way of understanding, speaking and writing about the world (Jørgensen and Phillips, 2002) – a shared lens through which people are viewing and interpreting phenomena (Svarstad, 2002). While discourses include one set of meanings and arguments, they exclude others, and provide the basic terms for analyses, debates, arguments and disagreements (Dryzek, 2013). In political conversations the power-geometries of discourses are influencing everything from problem definitions to problem solving, and among the leading discourses that play prominent roles in a political conversation, there is often a hegemony within them, which might prevent or enable certain actions. Actors that provide substance to such hegemonic discourses are performing discursive power (e.g. Svarstad, 2002, 2003), and discursive material is hence central to analysing power relations in policy-making processes. On the one hand, advocates of bioprospecting have framed a bioprospecting discourse by highlighting the large potential benefits for humankind in valuable but yet unknown biological components, and claiming that bioprospecting has the potential to be a win-win situation for all parties, as well as a building block for sustainable development (Paterson and Nelson, 2017; Reid et al., 1993). On the other hand, detractors have produced a discourse where the focal points have been that bioprospecting is a process whereby rich countries and companies have exploited resources and local knowledge in often less affluent communities and countries, and taken control over,

patented or monopolized resources that before benefited or could potentially benefit local communities (see e.g. Castree, 2003; Fredriksson, 2017; Robinson, 2010). *Biopiracy* was introduced as a concept to describe this exploitation and lack of fairness in bioprospecting – a reaction to the positive framing of bioprospecting as a means for sustainable development (e.g. Benjaminsen and Svarstad, 2017; Fredriksson, 2017; Mooney, 2000; Robinson, 2010; Robinson and Raven, 2017). Svarstad (2003) has termed these two alternative and conflicting discourses the “win-win discourse” and the “biopiracy discourse”. While advocates of the win-win discourse have been criticized for producing a narrative of bioprospecting that first and foremost promotes their own activities, whether it be research or commercial activities, advocates of the biopiracy discourse has been criticized for not ground well enough their criticism of bioprospecting in empirical evidence (Benjaminsen and Svarstad, 2017; Castree, 2003).

Bioprospecting takes place in a politically charged terrain where developing knowledge and products of great societal value at the same time as safeguarding biodiversity as well as social, cultural and economic equity is an onerous balancing act (cf. Hayden, 2006).

Debates about bioprospecting have to a large extent had a clear north-south dimension, and issues of fairness and equity were raised as part of the biopiracy discourse, where claims were made that big pharmaceutical companies from the global north claimed rights to and exploited resources in developing countries without sharing the benefits with the countries and communities where the biological material originated (see e.g. Oguamanam, 2006; Robinson and Raven, 2017; Shiva, 2007; Svarstad, 2003). These issues were discussed globally in international negotiations and conferences related to the UN Convention on Biological Diversity adopted in 1992 (United Nations, 1992). Although the convention was adopted without sufficiently dealing with bioprospecting, work with these issues continued, and after a long process the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity* came into force in 2014. At this time, the Norwegian government had already published a National Strategy on Marine Bioprospecting (Ministry of Fisheries and Coastal Affairs, 2009) as part of the government's strategy for the High North (Ministry of Foreign Affairs, 2011-2012).

A key issue, both in the Nagoya protocol and in the national strategy, are questions regarding rights to access, the collection and utilization of resources, and the sharing of costs and benefits, which are potentially high at both ends (Robinson and Raven, 2017; Rosendal et al., 2016; Tvedt et al., 2016). This is a very complex situation trying to manage private rights in shared land- and seascapes, involving national as well as international actors. Policy documents highlighted the many potential benefits from bioprospecting, while in the Nagoya Protocol, signatories, including Norway, agreed to ensure the benefits arising from genetic resources are shared in a fair and equitable way (see e.g. Fredriksson, 2017; Robinson and Raven, 2017). The operationalization and enforcement of the Nagoya Protocol, however, are matters left to each county to follow up, and this is what Norway is attempting through the process establishing bioprospecting regulations (Tvedt, 2013).

In Norway, as in other ocean oriented countries, new knowledge and technologies developed during the last two decades have gradually brought increased attention to marine environments (Ministry of Trade Industry and Fisheries, 2017). Norway has a well-established marine and maritime sector, a good economy and many highly competent research organisations directed towards studying marine environments (Rosendal et al., 2016). Broadening the focus from mainly land-based genetic resources in areas such as rain forests in “developing countries” toward marine environments in “developed countries” challenges the established bioprospecting discourses. Firstly, by shifting the focus to marine bioprospecting in a number of affluent coastal countries such as Norway, many potentially interesting genetic resources are located within the country's own borders. That means that Norwegian marine areas become interesting not only for Norwegian researchers and

companies, but also for foreign actors. Questions of fairness and equity thus shifts from being discussed along the traditional north/south or rich/poor axes, to become a question of fairness between groups of people, or between humans and non-humans, within the country's borders, or between different powerful foreign actors and Norwegian actors and interests. Secondly, marine environments are subject to a significantly different property regime, both in terms of formal law and customary rights. At one level, this might make the process of establishing new rights and concession regimes easier since there are fewer actors claiming their rights or their interests in these areas. At another level, it might also complicate the process significantly since there are few established customs and practices on which to base a new regulatory framework. In Norway, these are resources where the potential value is unknown, but legally they belong to the people of Norway. Hence, the stakeholders are many even though they have few representatives. Importantly, it is not only rights to access the material resources that are at play here. These are resources that mainly do not need to be harvested, i.e. once the material resource is collected and analysed it is the knowledge – the intellectual property – that make up the actual value.

The current bioeconomic transition has parallels with the major transitions Norway went through in the 1960s and 70s when the oil economy was established. Here, the government ensured national supervision and control for all operations on the Norwegian continental shelf where a large share of the income were channelled back to the state through tax regimes and where Norwegian companies were ensured contracts in the supply industries (Moses and Letnes, 2017). The oil resources are perceived by most actors as belonging to the public, and that they should contribute to financing the welfare state and securing jobs for Norwegian companies. If the bioeconomy can be just as important for the Norwegian economy as the petroleum sector has been, as many argue, remains to be seen, but there are certainly many initiatives both from the state and from private sectors that are aiming in that direction (Burton et al., 2020). Attempting to regulate marine bioprospecting is one of these.

4. Methods and data

In this article, the ongoing process, undertaken by the Norwegian Government and aiming to establish a Regulation to the Marine Resources Act and the Nature Diversity Act concerning bioprospecting, is examined. A draft Regulation was considered in 2013 (Ministry of Fisheries and Coastal Affairs and Ministry of Environment, 2013), and the aim was to regulate access, collection, utilization, cost/benefit sharing and organisation of bioprospecting. This draft received submissions from 44 stakeholders with a range of interests and perspectives, from which 11 had no comments. 33 of the consultancy bodies had substantial comments, many of them so critical and extensive that the government decided to rewrite the Regulation. The reworked draft was sent on a new hearing for public comments in 2017 (Ministry of Climate and Environment & Ministry of Trade and Fisheries, 2017), and received new submissions from 26 stakeholders. At the time of writing (February 2020), we are still waiting for the final version and the subsequent enactment of the Regulation.

The submissions to the Regulation drafts represents formal statement form vital institutions in the bioprospecting discourse, and are hence crucial actors for constituting, developing or conserving this discourse. Analysing text material produced by people or institutions enables the exploration of such discourses and discursive practices and the constitution of subject positions (Mason, 2002, see also Hall, 1997). A two-phased qualitative analysis of the hearing process to the Regulation is carried out. The first phase of the analysis is based on the submissions from consultancy bodies to the first regulation draft, as well as the regulation draft itself with its 22 paragraphs and the consultation paper – a 22 pages document explaining and discussing the background for the Regulation draft. An initial inductive thematic analysis of the documents was conducted where codes were derived inductively, and grouped

together. From this initial analysis a thematic framework was developed, and aided by qualitative data management software (Nvivo), sections from the data material was indexed accordingly. This analysis discerned leading discursive arguments pertaining to bioprospecting, and in the second phase of the analyses it is examined how these arguments are reflected in the revised Regulation draft from 2017 by comparing the two different Regulation drafts and the associated consultation papers. Table 1

The Regulation drafts, their consultation papers and all submissions from the consultancy bodies for both the 2013 and the 2017 drafts have throughout the process been publicly available, and thus retrieved, from the Ministry of Trade and Fisheries' (Ministry of Trade Industry and Fisheries, 2020) official webpage.

5. Discursive arguments of marine bioprospecting in Norway

The 2013 draft was based on three conditions. Firstly, the Regulation was supposed to follow up the Nagoya Protocol Agreement stating that each signing party must ensure a fair sharing of benefits from the utilization of genetic resources. The Nagoya Protocol imposes on the signing parties the requirement to establish a legal framework and management regime for a range of purposes connected to bioprospecting, including controlling access to, the sharing of information gained from these resources and the sharing of benefits from natural resources with the wider public. Secondly, the Regulation was to ensure predictable and fair conditions for business development based on genetic resources. It was important to avoid situations like the Cyclosporine A case, where private foreign businesses could gain large benefits based on Norwegian resources without having to share any of these. At the same time, it was important to attract international business to invest in bioprospecting in Norway. In the consultation paper, parallels were drawn to the quite strictly regulated Norwegian petroleum sector, which has been highly valuable for both business activities and innovation as well as for the wider public through benefit sharing (Moses and Letnes, 2017). Thirdly, the Regulation followed up the national strategy on bioprospecting from 2009, where especially marine bioprospecting was perceived as a significant component in the Norwegian Ocean Economy which was, and still is, seen as a major pillar for the future Norwegian post-oil economy (Ministry of Fisheries and Coastal Affairs and Ministry of Environment, 2013).

Thus, many factors and actors needed to be taken into account in the Regulation draft. The overall aim stated in the first paragraph was to (author's translation):

oversee and secure control of the extraction and utilisation of genetic resources, including that this is to be done in a sustainable way, as well as to ensure that a share of the benefits from utilizing Norwegian genetic material is distributed to the Norwegian people. The Regulation shall support aim of §1 in the UN Convention on Biologic Diversity and the Nagoya Protocol.

Table 1
Data material.

Regulation drafts	Draft Regulations, 2013 Regulations, 2013, 2017	2
Consultation papers	Consultation papers to the two draft Regulations	2
Submissions	Thematic focus	
Public agencies	Ministries and directorates with a various thematic priorities representing public interests	9
Universities and research institutions	Research policy and knowledge development	11
Businesses and commercialisation	Working for or with economic activities based on marine genetic material	6
Other	Unions, NGOs and committees connected to the bioeconomy sector	7
Total submissions		33

Hence, the Regulation was supposed to benefit the public, attract researchers and commercial actors leading to increased innovations. An issue that was explicitly omitted from the 2013 draft was how to handle the role of traditional knowledge and Indigenous rights. Instead of taking these issues into the Regulation, it was proposed that a separate Regulation should be developed, which was done by 2017 (Ministry of Climate and Environment, 2017). With respect to benefit sharing in general, a detailed system for the taxation of economic benefits from the commercialisation of genetic resources was proposed, as well a management regime for accessing collected material and knowledge developed in the bioprospecting process.

In the hearing documents to the 2013 process, we can discern and categorise four major discursive arguments concerning marine bioprospecting. These arguments reflect particular ways of understanding and reflecting upon bioprospecting, which all relate in one way or another to the two main bioprospecting discourses – the win-win discourse and the biopiracy discourse – where arguments are utilised in the struggle to gain hegemony and discursive power.

Firstly, there is a *common good argument* where the key message is that bioprospecting has the potential to play a major role as a provider of benefits for the society as a whole, and possibly be a pillar in the future welfare state and the national economy. Bioprospecting is seen as a process where research, innovation, business and welfare development can go hand in hand and be mutually reinforcing. For example, researchers develop new knowledge, companies make money from developing new products based on this knowledge and individual members of the society appreciate the products, whether they are drugs, food, fodder or cosmetics.

Utilization of genetic material has the potential to create repercussions significant for the economy and knowledge development. (...) Norway can be a trendsetter in terms of securing research, innovation and business development are safeguarded. (Consultation paper 2013, author's translation)

Moreover, through national and international regulation, nations from where the genes originate receive a fair share of the value produced in this process. The common good argument is promoted by politicians and organisations or individuals reflecting societal interests, not least as part of the strategic focus put on the oceans as a fundamental source of prosperity in the future Norwegian economy. For example, the Directorate for Nature Management stated (author's translation):

The Directorate for Nature Management is very positive that regulations are developed on the extraction and utilization of genetic material under the Nature Diversity Act. The public's right to, the appropriate utilization of and equitable distribution of the goods from such exploitation is an important issue both nationally and internationally. (...) The Directorate is not in a position to make a real assessment of the proposed system of benefit sharing, but believes the State's share may seem somewhat small.

Advocates of the common good argument promote the need to establish institutional frameworks designed to secure these ends. In this respect, the common good argument is manifested in strategic documents such as the Strategy for Marine Bioprospecting from 2009 and in the consultation paper to the 2013 draft, as well as in the ambition of the first Regulation draft where many aims and purposes were incorporated, and where a detailed system for benefit sharing was proposed. Actors actively advocating the common good discourse are politicians and state agencies with power to initiate such processes. The entire process of establishing the Regulation for bioprospecting is thus in many ways based on the common good argument.

Secondly, there is a *business development argument*. This concerns how to organize and manage a system where business actors will be willing and able to put money and time into a high-risk industry sector. The actors advocating this argument are people and organisations with commercial interest such as companies within the bio industry or

organisations interested in promoting commercial interests such as the technology transfer organisations connected to universities and other research institutions. As many consultancy bodies point out, in order to invest in bioprospecting projects, actors need an insurance that the capital invested would be returned if the project is successful. It is in the nature of bioprospecting that the outcome is unknown; thus bioprospecting involves a great deal of risk-taking, and if claims to share economic outcomes are too onerous or too unpredictable, investors might be reluctant to participate. This is an international market, and if the regulations are too strict in one territory, actors might choose other countries to work in and with. One technology transfer organisation argued that (author's translation):

In our experience, it is of great importance to small and medium-sized enterprises that they do not receive worse framework conditions than the foreign actors who promote similar interests in the market.

The draft regulation will impose stricter and more enforceable rules on Norwegian actors who wish to make the extraction and utilization of genetic material in Norway than on foreign actors who want the same.

Another aspect of this argument is that a large degree of bureaucracy connected to the different phases of bioprospecting might direct investor attention to other countries with fewer formalities to go through. To establish a Norwegian regulatory system of bioprospecting that does not put off potential investors and business is therefore an important element of this argument. An enterprise from the bio industry sector claimed that (author's translation):

The proposed regulation could be a major bureaucratic and financial burden for large parts of Norwegian research sector, both public and private, in addition to all relevant business activities. This in turn will weaken Norwegian research and the competitiveness of Norwegian businesses and Norwegian research institutions vis-à-vis foreign companies and institutions.

In the hearing statements, many of the actors criticized the Regulation draft for being too focused on the rights of the public and on benefit sharing. They argued that approach deterred investors and the corporate sector. As well, a designated policy for innovation and entrepreneurship was disregarded. It is problematized that there is a long process from the collected genetic material to the commercial end product where material and immaterial input factors are included at different stages and by different actors, and the connections are not necessarily easy to detect or calculate. Thus, connecting profitable business models with intricate models for benefit sharing is not necessarily possible or desirable, at least in their assessment.

Thirdly, there is a *knowledge production argument*, where developing new knowledge is the overarching goal. Different phases of a bioprospecting process are likely to be funded by different sources. While the initial phases where the genetic material is accessed, collected and analysed are mainly funded and organized by large state-funded research projects, sometimes in co-operation with the industry sector, the process from a promising lab result to a commercial end product is mostly funded by private companies, for example, pharmaceutical companies or companies in the food sector. These are expensive and time consuming processes, where it is at best very uncertain whether or not the outcome will have any commercial value. However, both processes, particularly the former, would most likely yield new knowledge, regardless any potential commercial value. The knowledge production argument centres on the freedom of research, and that an important premise of this freedom is that empirical material is easily accessible and that researchers have the right to explore and analyse genetic material without too many restrictions. One of the universities argued that the current regulation draft would hinder non-commercial research activities significantly and that there is a need to

rationalize approval and reporting routines so that this does not become a serious obstacle to the use of genetic material, neither for non-commercial nor commercial purposes the few times this will be the case.

Many actors, in particular researchers and research institutions, are concerned that the Regulation would force too much bureaucracy into the research and certification process, and they further highlight that it is a long way from accessing and analysing genetic material to a potential resultant commercial product. It is argued that the process of exploration and analysing collected material is separate from the process of taking promising results into a phase where commercial products are developed and commercialized. Thus, it is also argued that these two processes should be treated differently in terms of the degree of regulation. The 2013 draft, it is argued, is focused too much on the commercial side of bioprospecting, and in effect it is forcing too many obstacles on the research process based on a misguided view of bioprospecting as primarily a commercial process.

Fourthly, there is an *ethical argument* where morality is at the core. The main focus in the ethical argument is questions about sustainable utilization of natural resources and what is morally right and wrong in terms of justice between and among groups of people. This argument reflects the bioprospecting debate from the 1990s, where actors from developed countries were criticized for collecting, analysing and commercialising genetic material from developing countries, without the countries or local communities where the biological resources originated being included in terms of control over the resource, or benefits from them. Justice between different actors and stakeholders is central to the Nagoya Protocol, where signing parties must take measures to ensure Indigenous and local communities' prior informed consent and fair and equitable benefit-sharing. These measures must take into account community laws and procedures as well as customary practices. Actors within the ethical discourse criticized the 2013 draft for its reluctance to address ethical considerations of bioprospecting by e.g. leaving issues concerning Norwegian traditional knowledge and Indigenous and local communities out of the Regulation draft. The Government did, however, address these issues in the separate Regulation on Indigenous and traditional knowledge adopted in 2017 (Ministry of Climate and Environment, 2017). None of the actors opposed bioprospecting in general based on ethical considerations.

It is the nature of a hearing process like this that actors, regardless which of the arguments they advocated, endeavour to give legal backing to their arguments by referring to what is possible to put into the Regulation within current national and international legal framework. While some actors focused on legal technicalities and were neutral in their stance to bioprospecting and the substance of the Regulation, others substantiated their arguments and normative standpoints about what is *normatively* right or wrong with reference to what is or ought to be *legally* right and wrong.

6. Contested establishment of new regulatory regimes

Based on 34 critical remarks in the hearing round of the 2013 draft, a new Regulation draft was published in 2017. In the consultation paper to the 2017 draft, the government summed up the comments to the first draft:

Concerns about research, innovation and business development were prevalent among the actors that had comments. Several pointed out that the Regulation draft to a small degree reflected the realities it was meant to regulate, and that the proposed Regulation would lead to procedures for reporting and enforcement that were inexpedient and difficult to manage.

As we see, this summary is mainly based on the business development and knowledge production arguments, and it is no doubt that these two arguments were the most prominent when examining the hearing statements as a whole. The arguments had significant influence on how the next Regulation draft was framed. There are significant differences

between the 2013 and 2017 drafts, and most changes made the Regulation more directed towards business development and knowledge production, while the other considerations, securing the public interest and the common good, as well as ethical considerations, were restrained. For example, in the 2013 draft there was a separate chapter about benefit sharing, where a detailed description of how large a share of the gross income from utilizing the genetic material should be paid to the State was included. This chapter was removed from the 2017 draft and questions about benefit sharing are instead to be left to the managerial bodies to handle in each case. Another significant difference is that the chapter about genetic material and traditional knowledge from other countries in the 2013 draft, where it was suggested that if genetic material or traditional knowledge from other countries was used, actors needed to report this to the Government and obtain the necessary permissions from the countries where such things were gathered.

These and other amendments to the Regulation draft was a consequence of the much simplified and less ambitious aim and purpose of the Regulation. The general purpose of the Regulation is stated in §1. Common for §1 in both drafts is that the utilization of genetic resources should be done in an environmentally sustainable way. However, there are four major amendments to §1 from the 2013 to the 2017 draft. Firstly, §1 in the 2013 draft stated that the Regulation should "secure that a share of the benefits of utilizing genetic material would be allotted to the people of Norway", while in the 2017 draft this was reformulated so that the Regulations should "contribute to adequate sharing of benefits from utilizing genetic material". Questions regarding with whom benefits should be shared, what is meant by "contribute" and "adequate" are not dealt with in the 2017 draft. Secondly, in the 2017 draft, it is no longer a purpose of the Regulation to secure that the government has the power to oversee the collection and utilization of genetic material as was suggested in the 2013 draft. Thirdly, § 1 in the 2013 draft also stated that the Regulation should "support the purpose of article 1 in the Convention for Biodiversity and in the Nagoya Protocol". References to both these documents were removed in their entirety in the 2017 draft, while they are mentioned in the consultation paper as components in the basis for establishing the Regulation. Fourthly, the 2017 draft explicitly stated that one of the purposes of the Regulation is to "stimulate research and business development".

The process of establishing a Regulation for bioprospecting in Norway is part of the socio-technical transition that is currently taking place in the Norwegian marine bioeconomy. In the process of obtaining legal backing for claims to genetic resources in the Norwegian littoral, it is vital for the actors to gain discursive hegemony. Regular, physical presence is considered an important form of enacting rights and ownership to resources (Blomley, 2013). Likewise, Philipopoulos-Mihalopoulos (2015) asserts that the ultimate doing of justice is the occupation of, and movement through, physical spaces. However, even though it is argued that there is under-utilised potential in the oceans for common good purposes, these areas and materialities are 'invisible' for the wider public, and therefore, difficult to relate to, engage in and make claims to for other actors than those who have particular research or business interests to represent. The invisibility of the oceans thus lacks performative as well as discursive force, which makes it easier for actors with particular interests in the marine resources to picture the ocean space as empty and under-utilised. The oceans become increasingly "visible" as technology and knowledge has brought many of the ocean's resources that were previously unknown to the fore. This article demonstrates some of the complexities we meet when attempting to regulate and assign rights to ocean resources which are more visible to some than others. To organize space through assigning a rights system to a certain territory is a way to create or sustain power relations over that territory (Blomley, 2019), and developing a rights system over certain resources is an act that takes a material space into the immaterial. This is how "territory is generated" (Brighenti, 2010). However, "each territory is as heterogeneous as the ensemble of subjects and agents who form it by inhabiting

(territorializing upon) it” (Brighenti, 2010, 68). In the case presented in this article, the borders of the territory were already defined when drawing the map of the Norwegian continental shelf, and both the Nature Diversity Act and the Marine Resources Act has been applicable for these areas for a number of years. However, how to operationalize the acts when it comes to bioprospecting has been missing, and thus, the materialities in these areas have not been taken into the immaterial, and the territory has thus, in Brighenti’s terms, not been “generated”. In terrestrial areas, due to their visibility, the public can relate to the areas and resources that are up for debate, and hence the common good argument is more likely to be represented in debates regarding the use and protection of terrestrial resources. In ocean spaces, however, “the ensemble of subjects and agents” (cf. Brighenti, 2010) are not equal in the relational work of property (cf. Blomley, 2019). While the business development and knowledge production arguments were advocated by actors who represented certain interests, and thus, by whom the new purposes are more visible, the common good argument was primarily outlined in the consultation paper by the Government and not explicitly supported to any particular degree by the hearing parties.

The complexity is intensified when taking into account nonhuman agency and attend to the roles that animals, and in our example, genetic material from micro-organisms, have in co-constituting territory with humans and thus influencing the regulatory regimes (Braverman, 2016; Brown et al., 2019).

This article shows further that transitions are challenging existing normative and legal right systems. In some cases, established systems and structures are at stake and in other cases, such as for marine bioprospecting in Norway, new formal as well as informal arrangements and practices need to be built and established. Such new structures might seemingly be built from scratch, based on specific purposes, but in reality, these are complex processes where a range of interests and actors raising their claims in power struggles over the discursive hegemony. Choices and decisions made in these processes, such as the establishment of a Regulation and attached formal and informal practices, will be of great significance for how the actual matters at stake are organized and managed, but it might also influence the order of discourse of nature resource management at a wider scale. For comparison, the ‘path’ that was chosen in the Norwegian oil economy for the country to follow has had major influence on how the society as a whole thinks about oil resources within the Norwegian continental shelf, and thus how rights to the resources are managed (cf. Moses and Letnes, 2017). The current transition process in the Norwegian bioeconomy is facing a similar challenge, and the normative notions formed at the back of the management of the benefits from the petroleum resources may be the reason why so many of the actors advocating the common good argument refer to the way the petroleum economy was organized and managed in the debates concerning the future bioeconomy. Practices, markets and norms soon develop around the rights systems that are established (Blomley, 2014; Brown et al., 2019), and they influence the outcomes taking place at a later stage (Mahoney, 2000). The socio-legal arrangements developed during the transition process might become lock-in mechanisms – known and established cultural, economic, technological or juridical mechanisms that cause actors to choose existing systems and practices before new ones – that lead to path dependency (cf. e.g. Geels, 2011; Hansen & Bjørkhaug, 2017; Smith et al., 2005). Rights systems developed within the hegemonic discourses might thus ‘lock’ sectors in the bioeconomy into certain development pathways that have consequences for the potential value of the bioeconomy as an asset for the society as a whole, as well as for the environment, and which might be difficult to reverse at a later stage.

Many claim that the bioeconomy is going to be a major component in the future Norwegian economy, and “lead to increased value creation and employment” as stated in the Norwegian Government’s recent bioeconomy strategy (Ministry of Trade Industry and Fisheries, 2016). If so, we need to pay greater attention to the ongoing bioeconomic transition and its discursive power struggles, and how this influences longer

term legal as well as normative arrangements. We need to understand ways in which the co-production of materialities, law and society take place, as the bioeconomy is developing in a changing societal, institutional and technological context, destabilizing and challenging established regulatory and cultural systems, including those of managing marine bioprospecting. Models for how to operationalize the Marine Resources Act and the Nature Diversity Act stating that resources in the oceans off the Norwegian coast belongs to the public, are currently up for consideration where there is an ongoing struggle for discursive hegemony. At the time of writing, it is still not clear when and in what form the Regulation will be formally adopted, or if Norway like a range of other European countries in the end choose *not* to implement regulations for access and benefit sharing after all (see Fredriksson, 2017). Regardless of this outcome, a key lesson is that decisions taken over the bioeconomy today might have major consequences for citizens’ future access to publicly funded welfare, and knowledge and understanding about processes leading up to these decisions is of vital importance when policies for the future bioeconomy are shaped.

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