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The relevance of the human right to science for the conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction: A new legally binding instrument to support co-production of ocean knowledge across scales

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1. Introduction

This chapter will put forward the argument that the priority in the ongoing negotiations of a new international legally binding instrument (ILBI) on marine biodiversity of areas beyond national jurisdiction (BBNJ) should be framing clear international cooperation obligations on the co-production of ocean knowledge,¹ in order to support transformative conservation and sustainable use of BBNJ.² Co-production is understood here as ‘social partnership and joint governance’, that relies on the development of ‘shared concepts of collaboration.’³ These shared concepts could build upon the principles and requirements for resilience of socio-ecological systems, such as continuous learning, adaptive systems thinking, openness, and long-term monitoring and data sharing.⁴

¹ As opposed to more open-ended obligations or hortatory treaty language on cooperation: See, for instance, the proposed obligation to “promote” international cooperation in marine scientific research and in the development and transfer of marine technology under art 6 of the Revised Draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (2020) UN Doc A/CONF.232/2020/3, Annex (Draft text). See also the objective to “[promote the generation of knowledge and technological innovations, including by promoting and facilitating the development and conduct of marine scientific research in areas beyond national jurisdiction, in accordance with the Convention;]” in Draft text art 1.c (ibid).

² Transformation is ‘a fundamental, system-wide change that includes consideration of technological, economic and social factors, including in terms of paradigms, goals or values’ and to ‘[o]bstacles to achieving transformative change, including unequal power relations, lack of transparency, vested interests, unequal distribution of the costs and benefits of actions, tendencies for short-term decision-making, the psychology of losses and gains, the logic of market-driven processes, the lack of policy coherence and inertia’: See IPBES, Initial scoping report for Deliverable 1 (c): A thematic assessment of the underlying causes of biodiversity loss and the determinants of transformative change and options for achieving the 2050 Vision for Biodiversity (2021) available at https://ipbes.net/sites/default/files/Initial_scoping_transformative_change_assessment_EN.pdf accessed 23 July 2021.

³ Brigitte Nerlich, ‘The Co-production Confusion’ University of Nottingham blog post (20 March 2015) available at <https://blogs.nottingham.ac.uk/makingsciencepublic/2015/03/20/the-co-production-confusion/> accessed 23 July 2021, indicating that this understanding is mainly used in public policy but overlaps in part with Science and Technology Studies.

⁴ Siddharth Yadav and Kristina Gjerde, ‘The Ocean, Climate Change and Resilience: Making Ocean Areas beyond National Jurisdiction More Resilient to Climate Change and Other Anthropogenic Activities’ (2020) 122 *Marine Policy* 104184, 6.

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Marine areas beyond national jurisdiction (ABNJ) (the high seas and the Area)⁵ represent ‘4 billion years of evolution’⁶ and ‘contain 90% of the total biomass of the global ocean,’ encompassing a ‘wide range of ecological processes and dynamics, from large-scale migrations by hundreds of species to low-productivity, highly stable deep-sea benthic ecosystems rich in biodiversity.’⁷ But we have incomplete understanding of these dynamics, and of ecological impacts of human activities on them, which in itself undermines current conservation and sustainable use efforts.⁸

After revealing the science-related underpinnings of the topics under negotiation, the chapter will explore how and to what extent the different dimensions of the human right to science can help address power dynamics in ocean knowledge production with a view to clarifying legal and policy questions around the multilateral governance of BBNJ. The chapter will then apply international human rights obligations across all topics under negotiation (marine genetic resources (MGR); area-based management tools (ABMTs); environmental impact assessments (EIAs); and capacity building and technological transfer), emphasizing their inter-linkages. This also will shed new light on the institutional architecture needed for more coherent, sustainable and equitable approaches to international cooperation for the conservation and sustainable use of BBNJ, through inclusive co-production of ocean science across scales.⁹

2. Why is ocean knowledge co-production central to the BBNJ agreement?

The most contentious topic in the BBNJ negotiations is certainly benefit-sharing from MGR, to the point that it is often seen as an obstacle to the conservation elements of the package. It is here suggested, instead, to consider MGR as the most prominent exemplar of common equity challenges across marine scientific research (MSR): MGR are the tip of the iceberg due to the evidence of inequalities that arise from intellectual property applications, whereby only ten

⁵ United Nations Convention on the Law of the Sea (opened for signature 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 (LOSC), Parts VII and XI.

⁶ Alex Rogers and others, ‘Marine Genetic Resources in Areas Beyond National Jurisdiction: Promoting Marine Scientific Research and Enabling Equitable Benefit-sharing’ (2021) 8 *Frontiers in Marine Science* 667274.

⁷ Guillermo Crespo and others, ‘Beyond Static Spatial Management: Scientific and Legal Considerations for Dynamic Management in the High Seas’ (2020) 122 *Marine Policy* 104102, 1–2.

⁸ *ibid.*

⁹ In this context, “scale” is understood as different levels of social organization, from local to global, with a view to understanding how knowledge on the effectiveness of natural resource management approaches can scale up/down: Oran Young, *Governing Complex Systems: Social Capital for the Anthropocene* (MIT Press 2017) 37. The term scales also serves to allude to separate, but inter-related questions of knowledge and management of different levels of socio-ecological systems, from cells, microbiomes to ecoregions.

countries in the world appear to be benefitting from deep-sea research.¹⁰ But other aspects of deep-sea research are equally in the hands of a handful of States: There is only a restricted number of countries that can afford the costs and risks of deep-sea research vessels and therefore can control who has access to that source of knowledge. The vast majority of developing countries are not part of bioprospecting efforts and are also greatly underrepresented in marine taxonomic research.¹¹ In effect, ‘field capacity at the most basic level of technical and scientific knowledge [of the ocean] is lacking’ in most regions of the world¹² and ‘despite centuries of hydrographic survey effort, we have more and better data to describe the surface of the Moon or Mars than for most of the Earth’s seas.’¹³ This gap is particularly felt in the Caribbean, Africa and Oceania where nautical charts need to be urgently modernized and made compatible with satellite-based positioning systems, but capacity to plan and implement a prioritized survey programme is lacking.¹⁴ Meanwhile, nations with modern charts ‘actively prevent the release of data,’¹⁵ and restrict marine scientists’ mobility and access because of ‘the link between obtaining improved knowledge of the ocean and [States’] growing interest in exploring offshore natural resources and technological advances that might be relevant to naval security’.¹⁶

In addition, growing Global North-South scientific collaborations are ‘characterized by pharmaceutical or biotech companies working with established centres of excellence located in high-income countries’.¹⁷ As a result of these, as well as the increasing reliance on sequencing technologies and bioinformatics, ‘the capacity to undertake genomic research ... is inequitably distributed among countries’.¹⁸ Thus a call has been made to urgently ‘promote inclusive and responsible research and innovation that addresses equity differentials and fosters capacity and

¹⁰ Only 10 countries account for 90% of patents related to MGR (the US, Japan, certain EU countries, Switzerland and Norway): Sophie Arnaud-Haond, Jesús Arrieta and Carlos Duarte, ‘Marine Biodiversity and Gene Patents’ (2011) 331 *Science* 1521.

¹¹ Arianna Broggiato and others, ‘*Mare Geneticum*: Balancing Governance of Marine Genetic Resources in International Waters’ (2018) 33 *International Journal of Marine and Coastal Law* 3, 15–16, referring to Kim Juniper, ‘Use of Marine Genetic Resources’ in Michael Banks, Caroline Bissada and Peyman Eghtesadi Araghi (eds), *The First Global Integrated Marine Assessment World Ocean Assessment I* (UN 2016) 7–8, and Iris E Hendriks and Carlos M Duarte, ‘Allocation of Effort and Imbalances in Biodiversity Research’ (2008) 360 *Journal of Experimental Marine Biology and Ecology* 15, 17.

¹² Montserrat Gorina-Ysern, ‘Marine Scientific Research: Overview of Major Issues, Programmes and their Objectives’ in Hance D Smith, Juan Luis Suarez de Vivero and Tundi Agardy (eds), *Routledge Handbook of Ocean Resources and Management* (Routledge 2015) 127, 128.

¹³ Robert Wilson, ‘Surveying the Sea’ in Smith and others (n 12) 462.

¹⁴ *ibid* 470.

¹⁵ *ibid* 475.

¹⁶ Anna-Maria Hubert, ‘Marine Scientific Research and the Protection of the Seas and Oceans’ in Rosemary Rayfuse (ed), *Research Handbook on Marine Environmental Law* (Edward Elgar 2015) 313, 314.

¹⁷ Robert Blasiak and others, *The Ocean Genome: Conservation and the Fair, Equitable and Sustainable Use of Marine Genetic Resources* (World Resources Institute 2020) 26.

¹⁸ *ibid* 3.

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access to technology, while facilitating the realization of commitments to conserve and sustainably use the ocean's genetic diversity'.¹⁹

Deep-sea knowledge is what allows for enhanced understanding of the need for, and effectiveness of, conservation and sustainable use approaches in areas beyond national jurisdiction (ABNJ), as well as in areas within national jurisdiction (AWNJ) due to the ecological connectivity of the ocean that relies on currents and the movement of migratory species.²⁰ Understanding the "ocean genome" (the whole of the genetic material present in all marine biodiversity, including both the genes and the information they encode) is essential for 'determining the abundance and resilience of biological resources', 'increas[ing] awareness of the pressures facing marine biodiversity' and 'informing the designation of [marine protected areas (MPAs)] as well as innovative approaches to conservation'.²¹ But while our knowledge is making strides into the ocean genome, what we continue not to know is still vast: For instance, the 'functions of some 90 percent of genetic sequences collected from viruses remain unknown'.²² In that connection, it is also underscored that '[a]cknowledging the potential commercial value of biodiversity' – which tends to dominate the BBNJ negotiations, as opposed to the benefits of MGR for knowledge for conservation – 'may lead to better funding for biodiversity surveys that access a broad range of marine life and assess these for bioactivity, which may lead to improved biodiversity conservation measures'.²³

So, States with limited ocean knowledge are going to be necessarily less able to participate in decisions on EIAs, MPAs and other ABMTs in ABNJ,²⁴ as well as less able to manage sustainably marine spaces within national jurisdiction if they are among those with strongest connectivity to ABNJ and the shortest timeframes of connectivity.²⁵ In turn, it is down to these decisions on the creation of area-based and other management tools in ABNJ to

¹⁹ *ibid.*

²⁰ Ekaterina Popova and others, 'So far, yet so close: ecological connectivity between ABNJ and territorial waters' (2019) IIED Policy Brief available at <<https://pubs.iied.org/17500iied>> accessed 26 July 2021; Yadav and Gjerde (n 4) 4–5.

²¹ Blasiak and others (n 17) 3.

²² *ibid.* 8.

²³ *ibid.* 14.

²⁴ This is to a certain extent recognized in the Draft BBNJ text where capacity-building refers specifically to the capacity to develop, implement, monitor and manage, including to enforce, any ABMTs, including MPAs; and 'the capacity to conduct and evaluate environmental impact assessments [and strategic environmental assessments]' in Draft text art 42. UN Doc A/CONF.232/2020/3, Annex.

²⁵ Popova and others (n 20). For a discussion on ecological connectivity and references to "adjacency" in the BBNJ Draft text, see Joanna Mossop and Clive Schofield, 'Adjacency and Due Regard: The Role of Coastal States in the BBNJ Treaty' (2020) 122 *Marine Policy* 103877.

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‘safeguard genetic diversity at the ecosystem level’.²⁶ This underscores underlying epistemic justice and recognition issues below the surface of the negotiations on ABMT.

In addition, there are fundamental equity questions related to competing uses that may be impacted upon by ABMTs and that may benefit and disadvantage different sectors and groups: Being able to influence the evidence base upon which these decisions will be taken is a significant power that rests on the ability to produce the best available science. The role of science is also crucial to support the assessments of cumulative and transboundary impacts on marine biodiversity, which is expected to be a much-needed innovation of the ILBI. Which sectors of scientific knowledge will be relevant to that end remains to be clarified, as it remains open to negotiations if explicit references to climate change, ocean acidification, and deoxygenation will be included in the ILBI.²⁷ On the whole, the equity and capacity gap in deep-sea knowledge production affects the opportunities of countries in the Global South to influence the further development of the law of the sea: The link between ocean knowledge and law development is already recognised under the law of the sea.²⁸

Scientific cooperation provides not only the means to improve the quality of MSR, but also spreads opportunities for deep-sea research, including technology sharing and co-development across different countries which enhances capacity for ocean management. The capacity gap for integrated ocean science and holistic ocean governance is particularly felt vis-à-vis the need to bring together environmental, social and economic dimensions of different human activities, and all ecosystem components, both within and beyond AWNJ.²⁹ It is therefore to be welcomed that during the BBNJ negotiations, MGR have been increasingly linked to the negotiations on capacity building and technology transfer,³⁰ showing that the topic of MGR can have a constructive influence on the negotiations of other elements of the package (as opposed to being widely seen as a problematic element that hinders progress in other areas of the ILBI). Focusing on the fundamental contribution of the study of MGR of ABNJ to

²⁶ Blasiak and others (n 17).

²⁷ Draft text arts 1(6) and 14(e); Annex I (f) and Annex II, (a)(iv). Although see unbracketed text under General Approaches: ‘approach that builds ecosystem resilience to the adverse effects of climate change and ocean acidification and restores ecosystem integrity’ Draft text art 5(h).

²⁸ LOSC art 238; see also Nele Matz-Lück, ‘Article 238’ in Alexander Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (Hart 2017) 1609.

²⁹ Marjo Vierros and Harriet Harden-Davies, ‘Capacity Building and Technology Transfer for Improving Governance of Marine Areas both Beyond and Within National Jurisdiction’ (2020) 122 *Marine Policy* 104158, 1.

³⁰ Draft text art 42(f).

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‘increasing humankind’s knowledge about nature’³¹ serves to understand that scientific research and cooperation on MGR can underpin all elements of the package.

Along similar lines, the negotiations on MGR have also opened the door for integrating the recognition and consideration for traditional knowledge (TK) across the different elements of the package.³² TK has been increasingly recognised as relevant for the ILBI in relation to: Connectivity of species and marine processes across areas within and beyond national jurisdiction; management practices that can provide models for ABNJ; and (revived) traditional instrument-free navigation in areas within and beyond national jurisdiction, which may provide leads for bio-prospecting.³³ But equity questions concerning epistemic justice and recognition have emerged about the inclusion of TK in the notion of “best scientific knowledge” and the degree of participation of TK holders with regard to EIAs and MPAs.³⁴

Advancing basic knowledge about MGR of ABNJ more equitably, by genuinely partnering with scientist from the Global South and TK holders, can support the co-production of knowledge on the interconnectivity of the ocean and its relevance for life and well-being on Earth, which is relevant to the realization of multiple Sustainable Development Goals (SDGs) across all the elements of the ILBI.

2.1. Relevant obligations under the law of the sea

To that end, it is helpful to recall relevant LOSC obligations that should inform the BBNJ negotiations.³⁵ First of all, even if LOSC Part XII does not say so explicitly, scientific expertise, methods and information are necessary to implement the obligations on the protection of the marine environment, notably in light of the precautionary principle. This can be seen as an integral part of due diligence obligations³⁶ to continuously predict, monitor and respond to risks to the marine environment through exchange of information and establishing appropriate

³¹ Rüdiger Wolfrum, ‘Concluding Remarks’ (2009) 24 *The International Journal of Marine and Coastal Law* 343, 346.

³² See unbracketed text under Consultation and assessment of ABMT proposals at Draft text art 18(2)(c); under Impact Assessment and evaluation at Draft text art 31(1).

³³ Marjo Vierros and others, ‘Considering Indigenous Peoples and Local Communities in Governance of the Global Ocean Commons’ (2018) 119 *Marine Policy* 104039; Clement Yow Mulalap and others, ‘Traditional Knowledge and the BBNJ Instrument’ (2020) 122 *Marine Policy* 104103, 1 and 6.

³⁴ Draft text arts 5(i), 10bis, 16(1), 21(4), 31(2), 34(2), 35(3), 49(2), 51(3)(b) and (4)(b), 52(5)(e), and Annex II (b)(iii). However, see unbracketed text under Consultation and assessment of ABMT proposals at Draft text art 18(2)(c); under Impact Assessment and evaluation at Draft text art 31(1).

³⁵ Draft text art 4(1).

³⁶ Hubert, ‘Marine Scientific Research’ (n 16) 318, referring to *Advisory Opinion, Responsibilities and Obligations of States sponsoring persons and entities with respect to activities in the Area* (February 1, 2011) ITLOS, Seabed Disputes Chamber, para 113.

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scientific criteria for rules on marine pollution.³⁷ Relying on the results of EIAs, that are to be published or distributed through competent international organizations, can also be considered part of this due diligence requirement,³⁸ and the deliberate withholding of monitoring results could amount to a material breach of LOSC.³⁹

In addition, due diligence includes the duty to cooperate, and as part of that an obligation to integrate the efforts of scientists and remove obstacles to MSR for mutual benefit,⁴⁰ so obligations to support MSR are ‘for the benefit of all’.⁴¹ This is necessary to create opportunities for all to contribute to the establishment of scientific criteria to keep pace with scientific understanding of threats to the marine environment in light of precaution,⁴² with a view to identifying emerging threats such as ocean acidification.⁴³ The role of the BBNJ instrument, therefore, in supporting the creation of favourable conditions for MSR, as required under LOSC, can be to further develop the obligation to cooperate through the conclusion of international agreements to ‘*integrate the efforts of scientists* in studying the essence of phenomena and processes occurring in the marine environment and the interrelations between them’.⁴⁴

This would entail supporting ‘dialogue and inter[action] among scientists’ with a view to integrating their findings both for intra- and inter-disciplinarity for better understanding ‘the role of the ocean in the life of the planet’.⁴⁵ While LOSC obligations of scientific cooperation, extending both to the conduct of MSR, and the analysis of information for ocean management, may appear quite open-ended, it has been argued that absolute inaction would be a violation of LOSC.⁴⁶ In effect, it can be further argued that the duty to cooperate would be violated also in the absence of active attempts to bring parties to the negotiating table, refusing invitations to negotiate, or not negotiating in good faith with a view to advancing cooperation.⁴⁷ In particular, good faith entails the need to show others countries individually and the international community as a whole respect the taking into account the reasonable interests and legitimate

³⁷ LOSC arts 200, 201 and 204(1); James Harrison, *Saving the Oceans through Law* (Oxford University Press 2017) 35; Tim Stephens, ‘Article 201’ in Proelss (n 28) 1345; Eike Blitza, ‘Article 204’ in Proelss (n 28) 1363. See also the Draft text under capacity building: Draft text arts 43(2) and 46(1).

³⁸ LOSC art 194; Harrison (n 37) 34; Detlef Czybulka, ‘Article 194’ in Proelss (n 28) 1303.

³⁹ LOSC art 205; Eike Blitza, ‘Article 205’ in Proelss (n 28) 1367.

⁴⁰ LOSC arts 242 and 243.

⁴¹ Hubert, ‘Marine Scientific Research’ (n 16) 320–21.

⁴² LOSC art 201.

⁴³ Tim Stephens, ‘Article 200’ in Proelss (n 28) 1342.

⁴⁴ LOSC art 243 (emphasis added).

⁴⁵ LOSC art 243; see Irini Papanicolopulu, ‘Article 243’ in Proelss (n 28) 1637.

⁴⁶ LOSC art 242; see Irini Papanicolopulu, ‘Article 242’ in Proelss (n 28) 1631 and 1634.

⁴⁷ *Guyana v Suriname*, (Award, 17 September 2007) PCA 2004-04, paras 476–77.

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expectations of other States⁴⁸ in a predictable manner⁴⁹ so as to show trustworthiness and predictability. This can be demonstrated by relying on multilateral institutions to support the effective, objective and even-handed promotion and protection of the international community's interests.⁵⁰ A 'genuine intention to achieve a positive result',⁵¹ in this context, would also require treaty interpretation in good faith, that is avoiding unreasonably strict literal interpretations when they would allow a Party to obtain an unfair advantage, or exercise rights in a way that would be damaging to another Party,⁵² to the detriment of the effectiveness of a treaty.⁵³

These rules therefore provide the legal basis for elaborating further regulation to clarify the margin of discretion of States in this connection.⁵⁴ The BBNJ negotiations could thus be understood as the multilateral process that LOSC Parties are currently using to engage in, to create common platforms and adequate financing for scientific research cooperation.⁵⁵ Equally, the negotiations should be understood as a process to expand on LOSC obligations to 'actively promote...the *strengthening of the autonomous [MSR] capabilities of developing States*',⁵⁶ to ensure that scientific cooperation effectively gives scientists from the Global South and TK holders the opportunity to participate and benefit.⁵⁷

These considerations have a bearing on LOSC obligations related to technology transfer. The "key criterion" in LOSC technology transfer regime is enabling all parties concerned to benefit on an equitable basis from developments in MSR, particularly those aimed at stimulating the social and economic development of developing countries with due regard to their capacity in marine sciences.⁵⁸ Obligations of scientific and technical assistance towards developing states are mandatory, but do not clarify the extent of States' discretion. This reflects broader reluctance by developed States to agree to stricter rules, even if this affects overall

⁴⁸ Michel Virally, 'Review Essay: Good Faith in Public International Law' (1983) 77 *American Journal of International Law* 130.

⁴⁹ Saul Litvinoff, 'Good Faith,' (1997) 71 *Tulane Law Review* 1645, 1664.

⁵⁰ Bruno Simma, 'From Bilateralism to Community Interests in International Law' (1994) IV (250) *Recueil des Cours* 217, 319.

⁵¹ *Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada v United States)* [1984] ICJ Reports 246, para 87; Alexander Orakhelashvili, 'Treaty Interpretation: Effectiveness and Presumptions' in Alexander Orakhelashvili, *The Interpretation of Acts and Rules in Public International Law* (Oxford University Press 2008) 415; Robert Kolb, *Good Faith in International Law* (Hart Publishing 2017) 43.

⁵² Orakhelashvili (n 51) 415.

⁵³ Malgosia Fitzmaurice, 'The Law of Treaties' in Malcolm N Shaw (ed), *International Law* (6th edn, Oxford University Press 2008) 810, 832–38.

⁵⁴ Papanicolopulu, 'Article 242' (n 46) 1631 and 1634.

⁵⁵ *ibid* 1639.

⁵⁶ LOSC art 244(2) (emphasis added).

⁵⁷ Irini Papanicolopulu, 'Article 244' in Proelss (n 28) 1641.

⁵⁸ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge University Press 2012) 350.

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effectiveness of LOSC obligations to protect the marine environment.⁵⁹ These obligations, however, entail strengthening the autonomous scientific capacity in developing states,⁶⁰ to reduce reliance on external assistance in the long term, including to conduct EIAs.⁶¹

Overall, the LOSC regime provides some elements for supporting ocean knowledge co-production, which is also called for by marine scientists,⁶² but these elements are not fully developed and connected effectively with one another. In effect, there has been limited international law research on the LOSC regime on MSR and capacity building,⁶³ LOSC rules on technology are seen as ‘weak’ and ‘unclear’,⁶⁴ and LOSC rules on capacity building are largely not implemented, due to the ‘(still prevailing) lack of political will on the part of developed states’,⁶⁵ and generally ‘fall short...[of ensuring] continuous cooperation’.⁶⁶ The following sections will explore whether the interpretation of LOSC provisions in the light of other relevant areas of international law can help developed deeper international cooperation obligations on MSR, capacity building, technology transfer and environmental protection.

2.2. The potential of a broader notion of fair and equitable benefit-sharing

Against this background, the argument advanced here is that the BBNJ negotiations should clarify the scope, and limit the discretion of developed states in implementing, international obligations on marine scientific cooperation, capacity building and technology transfer because of the inter-dependence of LOSC obligations to protect the marine environment. This argument is reinforced by the consideration of the human rights dimensions of ocean knowledge co-production, as well as the human rights implications of failed or limited efforts in advancing ocean knowledge production, and of the resulting ineffective conversation and unsustainable use of the ocean.

To develop this argument, the international law concept of fair and equitable benefit-sharing⁶⁷ can support the consideration of effectiveness, human rights, and equity in MSR across the BBNJ negotiations.⁶⁸ Equity, as a general principle of international law, can support

⁵⁹ LOSC art 202; James Harrison, ‘Article 202’ in Proelss (n 28) 1349.

⁶⁰ LOSC art 244(2).

⁶¹ LOSC art 202; Harrison, ‘Article 202’ (n 59) 1351.

⁶² Rogers and others (n 6) 15.

⁶³ Gorina-Ysern (n 12) 129; Kristin Bartenstein, ‘Article 266’ in Proelss (n 28) 1766.

⁶⁴ Irini Papanicolopulu, ‘Article 278’ in Proelss (n 28) 1811.

⁶⁵ Bartenstein, ‘Article 266’ (n 63) 1765.

⁶⁶ Kristin Bartenstein, ‘Article 269’ in Proelss (n 28) 1788.

⁶⁷ Elisa Morgera, ‘The Need for an International Legal Concept of Fair and Equitable Benefit-sharing’ (2016) 27 *European Journal of International Law* 353.

⁶⁸ This chapter makes the case that fairness, equity and efficiency are interlinked. On equity and efficiency as included in LOSC preamble, as opposed to fairness and equity under the Convention on Biological Diversity

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an evolutive interpretation of LOSC.⁶⁹ Rather than necessarily focusing on the notion of benefit-sharing enshrined in the common heritage regime,⁷⁰ which remains controversial in the BBNJ negotiations, it has already been suggested to build upon fair and equitable benefit-sharing as enshrined in the ecosystem approach under the CBD as recognition and reward for ecosystem stewards, particularly developing countries and TK holders.⁷¹ Reference to the ecosystem approach does not seem controversial in the BBNJ negotiations, even if equity – which is considered part and parcel of it under the CBD – is.⁷²

Based on a combined reading of interpretative materials, “sharing” principally conveys the idea of agency, as opposed to the passive enjoyment of benefits,⁷³ and therefore a shift away from unidirectional (likely, top-down) or one-off flows of benefits. This interpretation thus focuses on the agency and active participation of developing countries and TK holders in the identification of benefits. In addition, benefit-sharing usually relies on a menu of benefits, the nature of which can be economic and non-economic. This arguably allows taking into account beneficiaries’ needs, values, and priorities through a contextual selection of the combination of benefits that may best serve to lay the foundation for partnership,⁷⁴ which is considered essential to build lasting capacity⁷⁵ and enhance access to ocean science and advance scientific cooperation through long-term mentoring and networking.⁷⁶ The expressions “fair and equitable”, which is generally left to subsequent negotiations, expresses the rationale of balancing competing rights and interests,⁷⁷ with a view to integrating both procedural and substantive dimensions of justice⁷⁸ into a relationship that is regulated by international law and is characterized by power imbalances.⁷⁹ The recourse to the twin expression “fair and equitable”

(signed 5 June 1992, entered in force 29 December 1993) 1760 UNTS 79 (CBD), see Fran Humphries and others, ‘A Tiered Approach to the Marine Genetic Resources Governance Framework under the Proposed UNCLOS Agreement for Biodiversity beyond National Jurisdiction (BBNJ)’ (2020) 122 *Marine Policy* 103910.

⁶⁹ Elisa Morgera, ‘Fair and Equitable Benefit-sharing in a New International Instrument on Marine Biodiversity: A Principled Approach towards Partnership Building?’ (2018–19) 5 *Maritime Safety and Security Law Journal* 48.

⁷⁰ LOSC art 140.

⁷¹ As *recognition* and *reward* for the use of TK and for the customary sustainable management and conservation of biological resources: Principles of the Ecosystem Approach, CBD Decision V/6 (2000), para 9 and Principle 8; Refinement and elaboration of the ecosystem approach, CBD Decision VII/11 (2004), annex, rationale to Principle 4. As discussed in Morgera, ‘International Legal Concept’ (n 67).

⁷² eg Draft text art 5.

⁷³ Mikel Mancisidor, ‘Is There such a Thing as a Human Right to Science in International Law?’ (2015) 4 *European Society of International Law* 1.

⁷⁴ Morgera, ‘New International Instrument’ (n 69).

⁷⁵ Vierros and Harden-Davies (n 29) 2.

⁷⁶ Rogers and others (n 6) 18.

⁷⁷ Ciarán Burke, *An Equitable Framework for Humanitarian Intervention* (Hart 2014) 197–98 and 250–51.

⁷⁸ By analogy with the standard of fair and equitable treatment in international investment law, see Roland Kläger, *Fair and Equitable Treatment in International Investment Law* (Cambridge University Press 2011) 130.

⁷⁹ *ibid.*

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thus serves to make explicit both procedural dimensions of justice (fairness) that determine the legitimacy of certain courses of action, as well as substantive dimensions of justice (equity).⁸⁰ In practice, they entail an iterative, concerted and good-faith dialogue (procedural dimension) to develop a common understanding of what different States may see as benefits (substantive dimension) arising from the conservation and sustainable use of BBNJ. This approach can support mutual learning, adaptive governance,⁸¹ and explicit engagement with power imbalances, which have been underscored by scholars advocating for centring BBNJ governance on resilience of socio-ecological systems⁸² and the inclusion of TK.⁸³

In the BBNJ context, this dialogue can serve to develop a common understanding across the different views of equity and of benefits that have already been voiced in the negotiations. For instance, the US and other developed States affirmed that research and development on MGR of ABNJ is a highly costly and time-consuming endeavour with uncertain results, that, when successful, would benefit humanity in the form of scientific advancements contributing to global public health, food security and environmental protection. These countries have indicated openness to some form of benefit-sharing, that would leave a wide margin of discretion through codes of conduct or the *ad hoc* sharing of data and research results, capacity building and scientific collaboration, but they have opposed monetary benefit-sharing.⁸⁴ On the other hand, developing countries have argued that monetary benefit-sharing should be included, together with non-monetary ones, so that both sharing the revenues arising from the commercial exploitation of MGR, as well as sharing opportunities to participate in scientific expeditions, follow-up research, relevant technology and research results, could contribute in predictable ways to increasing developing countries' capacities to conduct MSR and contribute to the protection of the marine environment and its sustainable use.⁸⁵

Applied at the multilateral level, the proposed interpretation of benefit-sharing opens the door for developing countries to co-identify the benefits and needs for transformative ocean governance through the integrated implementation of capacity-building, technology transfer, scientific cooperation and information-sharing obligations, even if these obligations are all

⁸⁰ *ibid* 141.

⁸¹ Morgera, 'New International Instrument' (n 69).

⁸² Yadav and Gjerde (n 4) 5–6.

⁸³ Vierros and others (n 33) 7.

⁸⁴ Elisa Morgera, 'Benefit-sharing in marine areas beyond national jurisdiction: where are we at? (Part I)' *BeneLex Blog* (2014) <<https://benelexblog.wordpress.com/2014/05/23/benefit-sharing-in-marine-areas-beyond-national-jurisdiction-where-are-we-at-part-i/>> accessed 26 July 2021.

⁸⁵ *ibid*.

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dependent on resources in donor countries, who for that reason tend to ‘call the shots’.⁸⁶ Co-identification of benefits, however, can support more effective delivery through multilateral facilitative and brokering arrangements to operationalize relevant duties of cooperation with a view to ensuring equitable distribution across different regions, monitoring of effectiveness, and learning from experience. The need for such an approach has already been demonstrated in other international processes, such as the International Seabed Authority, and the International Maritime Organization.⁸⁷ In addition, the proposed interpretation of benefit-sharing can support the engagement with another question about equity and benefits that has not yet emerged in the BBNJ negotiations: Climate change and its ‘impacts on both ocean circulation and the global distribution of species indicat[ing] that today’s patterns of ecological connectivity will not remain static in time’.⁸⁸

On a separate but related note, fair and equitable benefit-sharing is, together with free, prior and informed consent (FPIC), necessary to recognize and respectfully integrate indigenous peoples and local communities for their global contributions to the conservation and sustainable use of biodiversity, as well as their knowledge systems,⁸⁹ in ocean science-policy interfaces at different levels. Integrating TK in the ILBI, building upon other global environmental scientific processes such as the Intergovernmental Science-Policy Panel on Biodiversity and Ecosystem Services,⁹⁰ fair and equitable benefit-sharing would need to apply to all relevant ILBI elements, thereby allowing for the co-identification of benefits beyond the current State-centric model, and enhancing both transdisciplinary and inclusive ocean governance.⁹¹ Transdisciplinarity (‘the recognition of different knowledge systems, and the inclusion of underrepresented types of knowledge’⁹²) is increasingly seen as an essential element for transformative governance (‘an approach to environmental governance that has the

⁸⁶ Earth Negotiations Bulletin (ENB), *Summary and analysis of the third session of the BBNJ Preparatory Committee* (vol 25 2017) (121 and 124).

⁸⁷ Elisa Morgera and Mara Ntona, ‘Linking Small-Scale Fisheries to International Obligations on Marine Technology Transfer’ (2018) 93 *Marine Policy* 214.

⁸⁸ Popova and others (n 20).

⁸⁹ CBD art 8(j); Morgera, ‘International Legal Concept’ (n 67) 370.

⁹⁰ Annex II to decision IPBES-5/1: Approach to recognizing and working with indigenous and local knowledge in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2017). This is currently reflected in bracketed text referring to prior and informed consent or approval and involvement of these indigenous peoples and local communities. The clearing-house mechanism may act as an intermediary to facilitate access to such traditional knowledge. Access to such traditional knowledge shall be on mutually agreed terms (Draft text art 10bis; in references to ‘best available scientific information and knowledge, including relevant traditional knowledge of indigenous peoples and local communities’ (Draft text arts 5(a) and 10bis). See also Yow Mulalap and others (n 33) 7.

⁹¹ See the proposal for including indigenous and local knowledge as a dynamic and living system of knowledge under the ILBI in Humphries and others (n 68) 11–12.

⁹² Ingrid Visseren-Hamakers and Marcel Kok, ‘Introduction’ in Ingrid Visseren-Hamakers and Marcel Kok (eds), *Transforming Biodiversity Governance* (Cambridge University Press forthcoming 2021)

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capacity to respond to, manage, and trigger regime shifts in coupled socio-ecological systems at multiple scales...[having the] capacity to shape non-linear change⁹³). Transdisciplinary governance can complement and contribute to *integrative* and *inclusive* governance, which respectively aim to ensure that solutions have sustainable impacts at other scales and in other sectors, and to integrate those whose interests are currently not being taken into consideration, and those who represent values that contribute to sustainable development.⁹⁴ All these dimensions are seen as inter-related elements of transformative governance,⁹⁵ and can encompass the notion of ‘inclusive innovation’ that has been advocated for the stewardship of the ocean genome⁹⁶ through proposals supporting ocean knowledge co-production.

The following sections will thus explore whether this broader notion of fair and equitable benefit-sharing as part of the ecosystem approach can serve to address equity concerns in the production of ocean science as a condition for more inclusive and effective conservation and sustainable use of BBNJ. This question will be answered by reflecting on the interplay of international human rights law and international biodiversity law, as fair and equitable benefit-sharing is also part and parcel of the human right to science (the right of everyone to benefit from scientific advancements).⁹⁷ Notably, it will be investigated how a broad notion of fair and equitable benefit-sharing fits both the ecosystem approach and the human right to science, helping to clarify the content of the duty to cooperate under LOSC by recognizing power and capacity imbalances in current MSR in ABNJ and the need for genuine partnerships as opposed to one-off forms of collaboration.

3. The relevance of the human right to science

The focus on the human right to science, as will be discussed below, helps to reveal that LOSC obligations related to scientific cooperation, capacity-building and technology transfer, which are often seen in purely inter-State terms, have human rights implications. Thus, while developed countries interpreted these obligation in terms of almost unfettered discretion, the degree of discretion is limited by the need to implement also relevant international human rights law.⁹⁸ In the particular context of the BBNJ negotiations, human rights implications should be

⁹³ *ibid.* See also Yadav and Gjerde (n 4) 6.

⁹⁴ Elisa Morgera and others, ‘Integrative and Inclusive Governance for Ocean Biodiversity’ in Visseren-Hamakers and Kok (n 92).

⁹⁵ Visseren-Hamakers and Kok (n 93).

⁹⁶ Blasiak and others (n 17) 37.

⁹⁷ Universal Declaration of Human Rights (1948) UN Doc A/810 at 71, art 27.

⁹⁸ For an initial discussion, Elisa Morgera, ‘Fair and Equitable Benefit-sharing at the Crossroads of the Human Right to Science and International Biodiversity Law’ (2015) 4 *Laws* 803.

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connected to vulnerable communities in countries with strongest connectivity to ABNJ.⁹⁹ As our scientific understanding of other inter-connections between ecosystem services in ABNJ and human well-being on Earth progresses, we can also expect to be able to point to human rights implications for other societies or vulnerable groups in different States.

The human right to science is seen as an autonomous right that is worthy of protection for its contribution to the continuous raising of the material and spiritual standards of living of all members of society, both for individual emancipation and collective economic and social progress.¹⁰⁰ As such, it contributes to the enjoyment of other human rights such as the rights to food and health,¹⁰¹ and is therefore significant for the realization of SDGs 2 (hunger) and 3 (health and well-being). In addition, the right to science contributes to ‘[protecting] and [enabling] each person to develop his or her capacities for education and learning, to form enduring relationships with others, to take equal part in political, social and cultural life and to work without fear of discrimination’,¹⁰² therefore playing a part in the implementation of SDGs 4 (education), 8 (decent work) and 10 (inequality).¹⁰³

In that sense, the human right to science supports reflecting on how the BBNJ instrument can contribute to the realization of inter-connected SDGs, as aptly summarized by SDG target 14a ‘Increase scientific knowledge, develop research capacity and transfer marine technology...in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries.’¹⁰⁴ While these are not objectives that have been spelt out in the BBNJ negotiations, they underscore the opportunity (and in actual fact the obligation for States parties to relevant treaties) to develop the ILBI in a mutually supportive way¹⁰⁵ with other international agreements, notably international human rights treaties, as recommended in 2020 by the UN Special Rapporteur on Human Rights and the Environment.¹⁰⁶

⁹⁹ Popova and others (n 20).

¹⁰⁰ Aurora Plomer, *Patents, Human Rights and Access to Science* (Edward Elgar 2015).

¹⁰¹ William A Schabas, ‘Study of the right to enjoy the benefits of scientific and technological progress and its applications’ in Yvonne Donders and Vladimir Volodin (eds.), *Human Rights in Education, Science and Culture: Legal Developments and Challenges* (Ashgate Publishing 2007); Mancisidor (n 73); Audrey R Chapman, ‘Towards an understanding of the right to enjoy the benefits of scientific progress and its applications’ (2009) 8 *Journal of Human Rights* 1.

¹⁰² Plomer (n 100).

¹⁰³ See also Morgera and Ntona (n 87).

¹⁰⁴ Mara Ntona and Elisa Morgera, ‘Connecting SDG 14 with the other Sustainable Development Goals through Marine Spatial Planning’ (2018) 93 *Marine Policy* 295.

¹⁰⁵ Riccardo Pavoni, ‘Mutual Supportiveness as a Principle of Interpretation and Law-Making: A Watershed for the WTO-and-Competing-Regimes Debate?’ (2010) 21 *European Journal of International Law* 649.

¹⁰⁶ David Boyd, Report of the Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment, (2020) UN Doc A/75/161, para 88(j).

3.1. The content of the human right to science

The human right to science is not a new right: It was proclaimed in the Universal Declaration of Human Rights¹⁰⁷ and has been enshrined in several treaties, including the International Covenant on Economic, Social and Cultural Rights,¹⁰⁸ so its legally binding force is not under discussion. Admittedly, however, the scope, normative content and obligations of States with regard to the human right to science had remained underdeveloped until recently. For this reason, there have been virtually no efforts to implement the obligations to promote, protect and fulfil this right. Nonetheless, current efforts to clarify the content of the right to science provide useful insights for present purposes and indicate that international human rights bodies will devote increasing attention to States' conduct in this area.

In 2011, the UN Special Rapporteur in the field of cultural rights, Farida Shaheed, suggested that the right to science encompasses four distinct elements: The right to access the benefits of science by everyone without discrimination; the opportunity for all to contribute to scientific research; the obligation to protect all persons against negative consequences of scientific research or its applications on their food, health, security and environment; and the obligation to ensure that priorities for scientific research focus on key issues for the most vulnerable.¹⁰⁹ It is clear, therefore, that these normative elements chime with the notion of 'inclusive innovation' advocated with regard to the ocean genome, namely 'explicitly includ[ing] those who have been excluded from the development mainstream ... and produc[ing] and deliver[ing] innovative solutions to the problems of the poorest and most marginalised communities'.¹¹⁰

All the dimensions of the human right to science are relevant to the BBNJ negotiations on MGR. Legal scholarship on the right to science has put forward arguments that "sharing" benefits is a key conceptual element that emphasizes agency:¹¹¹ Even if not everyone may play

¹⁰⁷ See Schabas (n 101) on the broad consensus regarding the inclusion of the human right to science in the Universal Declaration of Human Rights.

¹⁰⁸ International Covenant on Economic, Social and Cultural Rights (opened for signature 16 December 1966, entered into force 3 January 1976) 6 ILM 360 (ICESCR) art 15. See also Charter of the Organization of American States (opened for signature 30 April 1948, entered into force December 13, 1951) 119 UNTS 3, art 38; American Declaration on the Rights and Duties of Man (adopted 2 May 1948) O.A.S. Res XXX, art XIII; Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights (opened for signature 17 November 1988, entered into force 16 November 1999) 28 ILM 156, art 14; Arab Charter on Human Rights (adopted 23 May 2004), reprinted in International Human Rights Reports 893 (2005), art 42.

¹⁰⁹ UNGA, Report of the Special Rapporteur in the field of cultural rights Shaheed: the right to enjoy the benefits of scientific progress and its applications (UN Doc A/HRC/20/26, 14 May 2012) paras 1, 25 and 30–43

¹¹⁰ Blasiak and others (n 17) 37.

¹¹¹ Mancisidor (n 73).

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an active part in scientific advancements, all persons should indisputably be able to participate in the benefits derived from it.¹¹² This interpretation chimes with the interpretation outlined above that benefit-sharing conveys the idea of the active participation in the identification of benefits and sharing modalities among those actors that are directly involved in deep-sea science and those that are not, and across different worldviews.¹¹³ The added value of benefit-sharing is thus to foster deeper international cooperation, based on the recognition of power and capacity imbalances and of the need for a relationship as opposed to a one-off form of collaboration related to matters of common concern of humankind.¹¹⁴

The other dimensions of the right, as spelt out by Rapporteur Shaheed, serve to address power dynamics that are affected or engendered by science and technology and are not explicitly addressed under international biodiversity law or the law of the sea. The benefit-sharing process could thus serve to critically assess whether information-sharing, capacity building and marine technology transfer lead to non-discriminatory results, prioritize the needs of the vulnerable, and factor in the need to protect against negative consequences of scientific research. In that way, the benefit-sharing process can prevent dependency on external, ready-made solutions that may not fit particular circumstances, or may allow for the exertion of undue influence by donor countries.¹¹⁵ The human right to science, therefore, emphasizes key substantive considerations (non-discrimination, priority benefitting the vulnerable, the prevention of environmental harm) that should inform the BBNJ negotiations on topics underpinned by scientific cooperation, as well as capacity building and technology transfer related to MGR, with a view to grounding ocean science co-production.

In 2020, the Committee on Economic, Social and Cultural Rights elaborated a General Comment to further clarify the content of the human right to science, emphasizing that ‘the development of science in the service of peace and human rights should be prioritized by States

¹¹² Chapman (n 101) 5–6. Note that not all versions of the right to science in different international human rights materials refer to benefit-sharing. For instance, whereas the Universal Declaration of Human Rights refers to sharing in the benefits of scientific advancement, the International Covenant on Economic, Social and Cultural Rights refers to the ‘right to enjoy benefits’. However, Mancisoro (n 73) has argued that the understanding of the wording used in the Declaration should contribute to the interpretation of the different wording in the Covenant in full.

¹¹³ Morgera, ‘Crossroads’ (n 98) 803–31.

¹¹⁴ Morgera, ‘International Legal Concept’ (n 67) 365.

¹¹⁵ Elisa Morgera, Elsa Tsioumani and Matthias Buck, *Unraveling the Nagoya Protocol: A Commentary on the Nagoya Protocol on Access and Benefit-sharing to the Convention on Biological Diversity* (Brill 2014) 313 and 331.

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over other uses'.¹¹⁶ The Committee elucidated that the human right to science applies to natural as well as social sciences, and to pure as well as applied research.¹¹⁷ Core obligations include ensuring access to those applications of scientific progress that are critical to the enjoyment of the right to health and other economic, social and cultural rights; and prioritizing allocation of public resources to research in areas where there is the greatest need for scientific progress in health, food and other basic needs related to economic, social and cultural rights, and the wellbeing of the population, especially with regard to vulnerable and marginalized groups.¹¹⁸ In light of these obligations, it appears a priority for States to first of all identify collectively the greatest need for progress in ocean science to support basic economic, social and cultural rights, taking into account ecological connectivity between areas within and beyond national jurisdiction, as well as our evolving understanding of the ecosystem services provided by BBNJ. This is the first essential step as to maximize opportunities (and in fact ensure compliance with underlying international obligations) for States to ensure that ILBI serves to realize multiple SDGs and the premise for ocean knowledge co-production.

In addition, the General Comment explicitly indicated that the human right to science also applies to inter-State relations, so that the 'collective benefits of knowledge should be shared globally'.¹¹⁹ The duty to cooperate internationally towards the fulfilment of all economic, social and cultural rights,¹²⁰ results in States' obligation to recognize the benefits from international scientific cooperation and to take steps through diplomatic and foreign relations, to promote an enabling global environment for the advancement of science and the enjoyment of the benefits of its applications,¹²¹ so as to take into account 'deep international disparities among countries in science and technology'.¹²² So States engaged in international law-making processes, are to promote collaboration between scientific communities of developed and developing countries to meet the needs of all countries and facilitating their progress, while respecting national regulations.¹²³ From the perspective of international human

¹¹⁶ Committee on Economic, Social and Cultural Rights, General Comment No 25 (2020) on science and economic, social and cultural rights (arts 15(1)(b), (2), (3) and (4) of the International Covenant on Economic, Social and Cultural Rights (2020) UN Doc E/C.12/GC/25, para 6).

¹¹⁷ *ibid.*

¹¹⁸ *ibid.*, para 52.

¹¹⁹ Anna-Maria Hubert, 'The Human Right to Science and Its Relationship to International Environmental Law' (2020) 31 *European Journal of International Law* 625. See also Jacqueline Peel, 'The "Rights" Way to Democratize the Science-Policy Interface in International Environmental Law? A Reply to Anna-Maria Hubert' (2020) 31 *European Journal of International Law* 657.

¹²⁰ ICESCR art 2 and arts 55 and 56 of the Charter of the United Nations, (1945) 1 UNTS XVI.

¹²¹ ICESCR art 15(4).

¹²² UN Doc E/C.12/GC/25, para 79.

¹²³ UN Doc E/C.12/GC/25, para 79.

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rights law, multilateral agreements should enable developing countries to build their capacity to participate in generating and sharing scientific knowledge and benefiting from its applications, as States acting on the international stage ‘cannot ignore their human rights obligations’.¹²⁴

Furthermore, the human right to science has implications for the recognition and respect of TK under the ILBI, and the underlying human rights of indigenous peoples and other knowledge holders. The Committee on Economic, Social and Cultural Rights clearly indicated that when negotiating international agreements, States should ensure that TK is protected through an obligation to obtain FPIC when State or non-State actors conduct research, take decisions or create policies related to science that have an impact on indigenous peoples or when using their knowledge.¹²⁵ While these are critical but succinct indications, Parties to the Convention on Biological Diversity (CBD) that are negotiating the ILBI can also rely on the 2016 CBD Mo’otz Kuxtal Guidelines on consent and benefit-sharing from the use of TK. These Guidelines have been intergovernmentally negotiated with significant inputs from indigenous peoples’ representatives, and were adopted by consensus.¹²⁶ The Guidelines contain several elements that serve to explain what “free” prior and informed consent means, which remains controversial in international biodiversity¹²⁷ and human rights law.¹²⁸ Fundamentally, the Guidelines emphasize that FPIC is a ‘*continual* process of building mutually beneficial, *ongoing* arrangements between users and holders of TK, in order to build trust, good relations, mutual understanding, intercultural spaces, knowledge exchanges, and to create new knowledge and reconciliation.’¹²⁹ This is a key clarification that consent or approval is an iterative process, not a one-time exercise, which ‘should underpin and be an integral part of

¹²⁴ UN Doc E/C.12/GC/25, para 79, citing E/C.12/2016/1.

¹²⁵ UN Doc E/C.12/GC/25, para 40.

¹²⁶ Elisa Morgera, *Towards International Guidelines on Prior Informed Consent and Fair and Equitable Benefit-sharing from the Use of Traditional Knowledge*, BeneLex Blog (9 December 2015) <<https://benelexblog.wordpress.com/2015/12/09/towards-international-guidelines-on-prior-informed-consent-and-fair-and-equitable-benefit-sharing-from-the-use-of-traditional-knowledge/>> accessed 26 July 2021.

¹²⁷ It may be noted that CBD Parties’ have divergent views on adopting the terminology FPIC in the title of The Mo’otz Kuxtal Voluntary Guidelines for the development of mechanisms, legislation or other appropriate initiatives to ensure the ‘prior and informed consent’, ‘free, prior and informed consent’, or ‘approval and involvement’, depending on national circumstances, of indigenous peoples and local communities for accessing their knowledge, innovations and practices, for fair and equitable sharing of benefits arising from the use of their knowledge, innovations and practices relevant for the conservation and sustainable use of biological diversity, and for reporting and preventing unlawful appropriation of traditional knowledge (CBD Dec. XIII/18, 2016) (hereinafter Mo’otz Kuxtal Voluntary Guidelines).

¹²⁸ eg Mattias Århén, *Indigenous Peoples in the International Legal System* (Oxford University Press 2016) 217–18; José Carolos Morales (Expert Mechanism on the Rights of Indigenous Peoples), *Follow-up Report on Indigenous Peoples and the Right to Participate in Decision-making, with a Focus on Extractive Industries* (2012) UN Doc A/HRC/21/55, paras 38(b), 39(h) and 43.

¹²⁹ Mo’otz Kuxtal Guidelines, para 8 (internal citations omitted) (emphasis added).

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developing a relationship between users and providers of [TK].¹³⁰ In line with this understanding, the Mo'otz Kuxtal Guidelines emphasize that benefit-sharing is also about iterative partnership building, rather than a top-down, one-time or unilateral flow of benefits where indigenous peoples are passive beneficiaries.¹³¹ Furthermore, the Mo'otz Kuxtal Guidelines draw attention to the role of benefit-sharing in supporting cultural reproduction, by stating that 'benefit-sharing could include a way of recognizing and strengthening the contribution of indigenous peoples and local communities to the conservation and sustainable use of biological diversity, including by supporting the intergenerational transmission of [TK]'.¹³² All these elements can inform substantive and institutional modalities of international cooperation in the BBNJ context, feeding into a clearer and more integrated approach to ocean knowledge co-production.

On the whole, compared to other human rights that are also relevant for the BBNJ negotiations, the human right to science focuses on the agency for developing countries, as well as TK holders, in co-identifying benefits and more equitable modalities for international scientific cooperation for the protection and full realization of other human rights (and multiple SDGs), with an emphasis on the vulnerable. Thus, the human right to science can be used to support the progressive development of the international law in relation to the marine environment to support 'effective, equitable, democratically legitimate and accountable processes and outcomes in relation to the application of science and technology'.¹³³ Along these lines, the ILBI should contribute to enhancing the capacity of developing countries (particularly those that are most connected to ABNJ) and of TK holders to contribute to ocean science and participate in more integrated, inclusive and transdisciplinary decision making on BBNJ, by fostering co-production of ocean knowledge and transformative governance. This in turn would require inter- and trans-disciplinary research to develop new, or adapt existing, scientific methods and tools, such as modelling, to the respectful and constructive integration of TK, although some international experience on the integration of indigenous and local knowledge in global scientific assessments is being accrued.¹³⁴

It must be acknowledged, however, that there continues to be scepticism and criticism that recourse to human rights is inherently anthropocentric and detracts from focusing on ecosystem

¹³⁰ *ibid.*

¹³¹ *ibid* para 23(a). The need for partnership with indigenous and local knowledge is also underscored by Yow Mulalap and others (n 33) 7.

¹³² Mo'otz Kuxtal Guidelines, para 13.

¹³³ Hubert, 'Human Right to Science' (n 119) 625.

¹³⁴ Vierros and others (n 33) 7.

integrity, which could be considered at the core of the ILBI objectives of conservation and sustainable use of biodiversity. It is argued here, however, that growing scientific understanding of the inter-dependencies of human well-being and biodiversity reveals a potentially undue concern about anthropocentricity: Humans are part and parcel of ecosystems, as deeply as at the level of microbiota, for instance.¹³⁵ So as long as human rights are used to the benefit of that inter-dependency, ecosystems stand to benefit as much as humans. The consideration of these inter-dependencies opens sites for a more informed political debate that move away from an expert-driven and technocratic approach focused on minimizing damage that is ‘prevalent in international environmental law’,¹³⁶ and speaks to the concerns about anthropocentrism. Instead, a broader understanding of the risks and benefits for both humans and nature can be supported by the consideration of the different dimensions of the right to science.¹³⁷

Ultimately, the human right to science helps to bring into the BBNJ deliberations more serious and systematic consideration of the power issues that characterize MSR and that prevent transformative governance. After all, for the ILBI to make a real difference in the implementation of LOSC provisions on MSR that can contribute to effective conservation and sustainable use of BBNJ, real-life challenges need to be understood and addressed.¹³⁸ As social scientists have amply demonstrated, notwithstanding a culture of peer review and sharing among scientists, in practice (natural and social) sciences may be marked by competitiveness, secrecy and vested interests, and the need for interdisciplinarity may prevent the application of the checks of established disciplinary standards.¹³⁹ Exogenous power dynamics at play in science have also been increasingly revealed.¹⁴⁰ The impacts of neoliberalism on scientific research practices include the diminution of public funding, the narrowing of scientific agendas on the needs of commercial actors, and the intensification of intellectual property rights impeding the production and dissemination of scientific findings.¹⁴¹

¹³⁵ World Health Organization and Secretariat of the Convention on Biological Diversity (WHO/CBD), *State of Knowledge Review on Biodiversity and Health, Connecting Global Priorities: Biodiversity Human Health*, 2016, Summary and Key messages <<https://www.cbd.int/health/doc/Summary-SOK-Final.pdf>> accessed 26 July 2021.

¹³⁶ Hubert, ‘Human Right to Science’ (n 119) 655.

¹³⁷ *ibid* 652.

¹³⁸ Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (2009) paras 13(c) and 16.

¹³⁹ Sheila Jasanoff, ‘Serviceable Truths: Science for Action in Law and Policy’ (2015) 93 *Texas Law Review* 1723, 1738–40.

¹⁴⁰ Nico Stehr, ‘The Social and Political Control of Knowledge in Modern Society’ (2003) 55 *Science Journal* 643; Saskia Vermeylen, Georges Martin, and Roland Clift, ‘Intellectual Property, Rights Systems and the Assemblage of Local Knowledge Systems’ (2008) 15 *International Journal of Cultural Property* 201, 210.

¹⁴¹ Special Issue on Science and Technology Studies and Neoliberal Science of (2010) 40 *Social Studies of Science*.

These and other evolving features of scientific endeavors have critical, but often overlooked, implications for legal distinctions between commercial and non-commercial research, for instance. Besides pure taxonomic activity, empirical analysis of scientific practices has found it extremely difficult to predict if and when genetic resources will be used for research and/or for R&D purposes so the lines between non-commercial/commercial, basic/applied research are increasingly blurred and even the existence of intellectual property rights may not be a sufficient basis for determining whether research is commercial or non-commercial.¹⁴² As a result, the selection and framing of research questions, and the selection and use of evidence,¹⁴³ have implications for other public policy objectives down the line such as inclusiveness, responsiveness to societal needs,¹⁴⁴ and fit into social practices and local meaning.¹⁴⁵

4. What difference could the human right to science make for the BBNJ negotiations?

Applying the lens of international human rights law, and in particular the human right to science, to the governance of BBNJ is necessary, first, to clarify that international scientific cooperation is not just a matter of the law of the sea and of international biodiversity law. This should not come as a complete surprise, as LOSC itself indicates that MSR is to be conducted in compliance with all relevant regulations,¹⁴⁶ which ‘opens the door for the right to science to influence the interpretation of [this] regime’.¹⁴⁷ Clarifying that international obligations on marine scientific cooperation provide a vehicle for implementing human rights, in turn, serves to underscore their legally binding nature,¹⁴⁸ as questions have been raised in the BBNJ negotiations about whether or not the ILBI should include mandatory provisions on benefit-sharing, technology transfer and capacity building.¹⁴⁹

In addition, interpreting the obligations that are framed in general terms under LOSC and the CBD in a mutually supportive way also in the light of international human rights law,

¹⁴² Elisa Morgera and Miranda Geelhoed, ‘The notion of “Utilisation” in the Nagoya Protocol and the EU ABS regulation for the upstream actors’ (2016) Report to the European Commission <<https://ec.europa.eu/environment/nature/biodiversity/international/abs/pdf/ABS%20Final%20Report%20upstream%20users.pdf>> accessed 26 July 2021.

¹⁴² ENB PrepCom4 (n 86).

¹⁴³ Jasanoff, ‘Serviceable Truths’ (n 139) 1742–43.

¹⁴⁴ Sheila Jasanoff, ‘Technologies of Humility: Citizen Participation in Governing Science’ (2003) 41 *Minerva* 223.

¹⁴⁵ Sheila Jasanoff, ‘A New Climate for Society’ (2010) 27 *Theory, Culture & Society* 233.

¹⁴⁶ LOSC art 240(d).

¹⁴⁷ Hubert, ‘Human Right to Science’ (n 119) 647.

¹⁴⁸ *ibid* 628.

¹⁴⁹ *eg* Draft text art 44.

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serves to clarify the limits to States' discretion and the content of their due diligence obligations. For instance, States have minimum standards to meet in negotiating treaty provisions on benefit-sharing, capacity building and technology transfer, including intellectual property, in the light of application of the human right to science to inter-State relations. This is quite a remarkable departure from the LOSC deference to intellectual property rights seen as the 'promise of profit secured by exclusive commercialization rights'.¹⁵⁰ Rather than allowing States to choose between 'legislative, administrative or policy measures' on benefit-sharing,¹⁵¹ legislative guarantees should be specifically required to ensure protection of relevant human rights.¹⁵² In addition, obligations on ABMTs and EIAs need to clarify due diligence standards in preventing negative impacts on the human rights of individuals and communities that are exposed to the impacts of activities in ABNJ because of ecological connectivity.¹⁵³ Furthermore, human rights standards need to be applied to the notion of consultation and participation¹⁵⁴ across the BBNJ instrument, moving beyond an unqualified notion of public participation or stakeholder engagement.

4.1. MGR, capacity building and technology transfer

As I have argued elsewhere,¹⁵⁵ the human right to science can support a principled and integrated approach to multilateral benefit-sharing from MGR, fostering deeper cooperation on the basis of existing LOSC obligations on scientific research, capacity building, technology transfer and environmental protection. This could allow for the ILBI to contribute to responsible and inclusive research and innovation as 'the low chance of commercial success from biodiscovery, combined with the long timeframe for potential financial returns, means that some of the most significant benefits are non-monetary, emerging from the research process itself rather than from commercial products.'¹⁵⁶

So far in the BBNJ negotiations, proposals have generally focused on types and triggers of benefits. Benefit-sharing was then linked to access, based on the idea that different pre-

¹⁵⁰ Kristin Bartenstein, 'Article 267' in Proelss (n 28) 1774.

¹⁵¹ Draft text art 10.

¹⁵² With regard, for instance, to protecting the rights of TK holders, see Inter-American Court of Human Rights, *Case of the Saramaka People v. Suriname*, Judgment (Preliminary Objections, Merits, Reparations and Costs) 28 November 2007, para 194.d; *Case of Kaliña and Lokono Peoples v Suriname*, Judgment (Merits, Reparations and Costs) 25 November 2015, para 305(d); *Kichwa Indigenous Community of Sarayaku v Ecuador* Judgement (Merits and reparations) 27 June 2012, paras 299–300.

¹⁵³ Popova and others (n 20).

¹⁵⁴ See Yadav and Gjerde (n 4) 6, on the importance of participation for resilience.

¹⁵⁵ Morgera 'International Legal Concept' (n 67). This proposal was supported by Blasiak and others (n 17) 38–39.

¹⁵⁶ Blasiak and others (n 17) 38.

conditions could be set for access for different actors or thresholds, including requirements to provide capacity building and technology transfer for the analysis and use of MGR.¹⁵⁷ Among the possible conditions, one was identified as an upfront monetary contribution by upstream researchers into a global benefit-sharing fund as a mandatory advance payment, or as a voluntary payment to ensure exclusive access to certain MGR.¹⁵⁸ Another (additional or alternative) option was for upstream researchers (collections and academic research institutions¹⁵⁹) to ensure facilitated access to MGR samples and research findings, on the basis of existing LOSC obligations on MSR. The sharing of pre-cruise information, samples and the publication of cruise reports, have the potential to minimize the need for re-sampling,¹⁶⁰ thereby contributing to preventing environmental harm, while expediting access to MGR and generally supporting MSR cooperation ‘through transparency and coordination at regional and global scales.’¹⁶¹ As the value of genetic resources is not clear at the time of access, payments by operators further down the research-and-development chain were also considered upon commercialization of products derived from MGR.¹⁶² Options for benefit-sharing decoupled from access have also been put forward in the literature.¹⁶³ Fundamentally, however, divergent views persist in the negotiations on whether and how benefit-sharing should be equitable, whether monetary benefit-sharing should be required, and whether an international benefit-sharing mechanism would be needed.¹⁶⁴

Against this background, the argument developed here is to assess various technical proposals for the ILBI¹⁶⁵ based on a broad understanding of fair and equitable benefit-sharing as part of the human right to science and the ecosystem approach. In other words, shifting from the argument often voiced during the BBNJ negotiations that new benefit-sharing obligations could negatively impact on MSR and its contribution to conservation and sustainable use of BBNJ,¹⁶⁶ to a logic of ocean knowledge co-production. Thus, the merits of different technical

¹⁵⁷ ENB (n 68).

¹⁵⁸ Broggiato and others (n 11) 28–29.

¹⁵⁹ Morgera and Geelhoed (n 142).

¹⁶⁰ Thomas Greiber, ‘Common Pools for Marine Genetic Resources: A Possible Instrument for a Future Multilateral Agreement addressing Marine Biodiversity in Areas beyond National Jurisdiction’ in Evanson C Kamau and Gerdg Winter (eds), *Common Pools of Genetic Resources: Equity and Innovation in International Biodiversity Law* (Routledge 2013) 399, 409; Rogers and others (n 6) 8 and 12.

¹⁶¹ Rogers and others (n 6) 5 and 17.

¹⁶² Broggiato and others (n 11); Morten Tvedt and Ane Jorem, ‘Bioprospecting in the High Seas: Regulatory Options for Benefit Sharing’ (2013) 16 *Journal of World Intellectual Property* 150, 154.

¹⁶³ Humphries and others (n 68).

¹⁶⁴ Draft text art 11.

¹⁶⁵ Broggiato and others (n 13); Humphries and others (n 69); Tvedt and Jorem (n 161).

¹⁶⁶ ENB (n 86).

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proposals should be assessed on the basis of whether they support a more concerted, institutionalized multilateral approach to ensure responsiveness to the needs of beneficiaries, provide oversight of the distribution of benefits across different regions and scales, and contribute to a more systematic encouragement of virtuous circles through capacity building and technology transfer. Such an assessment should focus on the co-identification of real-world opportunities to increase the capacities in the Global South and among TK holders to actively participate in transformative ocean conservation and management, in the light of a shared understanding of power imbalances. To that end, an appropriate multilateral institutional structure would identify collectively the greatest need for progress in ocean science to support basic economic, social and cultural rights, taking into account ecological connectivity between areas within and beyond national jurisdiction, as well as our evolving understanding of the ecosystem services provided by BBNJ.

This would require engaging directly with developed States in their capacity as ocean research funders and discussing funding priorities and coordinated approaches, with a view to increasing the ‘rigor, efficiency and effectiveness in a number of aspects of MSR including on MGR of ABNJ’,¹⁶⁷ with a view to supporting long-term capacity-building and technology transfer and skills development (particularly for early-career researchers) across disciplines through knowledge co-production, including to contribute to EIAs.¹⁶⁸ Funders should also reflect on supporting new collaborative approaches and learning across scales,¹⁶⁹ as a way to support ocean knowledge co-production and transformative governance.

The human right to science can also support negotiations on digital sequence information under the BBNJ process, focusing on existing information-sharing obligations, promoting transparency and the gradual development of multilateral governance of genetic resource-related information.¹⁷⁰ This institutionalized approach could further respond to the considerations made under the human right to science on technology transfer.¹⁷¹ Shaheed pointed to an

¹⁶⁷ Rogers and others (n 6) 18 and 20.

¹⁶⁸ *ibid* 15 and 18.

¹⁶⁹ Morgera and Ntona (n 87).

¹⁷⁰ For a summary of how this issue was discussed in the BBNJ negotiations, Charles Lawson and Michelle Rourke, ‘Digital Sequence Information as a Marine Genetic Resource under the Proposed UNCLOS Legally Binding Instrument’ (2020) 122 *Marine Policy* 103878. See also the proposal for including DSI in Humphries and others (n 68) 9–11.

¹⁷¹ Morgera ‘International Legal Concept’ (n 67). For a different view, see Rumiana Yotova and Bartha Knoppers, ‘The Right to Benefit from Science and Its Implications for Genomic Data Sharing’ (2020) 31 *European Journal of International Law* 665.

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implied obligation for developing countries [to prioritize] the development, import and dissemination of simple and inexpensive technologies that can improve the life of marginalized populations rather than innovations that disproportionately favour educated and economically affluent individuals and regions.¹⁷²

She then underscored a

corresponding obligation for industrialized countries to comply with their international legal obligations through provisions of direct aid, as well as development of international collaborative models of research and development for the benefit of developing countries and their populations.¹⁷³

These recommendations should be read in conjunction with the need to take into account the preferences of intended beneficiaries and local contextual elements in assessing which technologies may be usefully and equitably shared, as was cautioned by former UN Special Rapporteur on the Right to Food, De Schutter.¹⁷⁴ A global institutionalized approach to benefit-sharing could thus support States' compliance with their international human rights obligations in the joint setting of priorities and understanding of 'legitimate interests'¹⁷⁵ and 'needs of developing States'¹⁷⁶ in terms of basic economic, social and cultural rights, taking into account ecological connectivity between areas within and beyond national jurisdiction, as well as our evolving understanding of the ecosystem services provided by BBNJ in the context of capacity building and technology transfer.

Such an institutionalized approach could take the form of a multilateral platform for dialogue, learning, oversight and priority-setting to integrate expertise from the bottom up and support the agency of beneficiaries (TK holders and scientists from the Global South), as well as database managers, with a view to ensuring transparency, continuous learning and genuine partnership-building to identify and assess obstacles, and to propose enhancements, to the interoperability of existing systems and the distribution of benefits across regions and scales.¹⁷⁷

4.2. EIAs and ABMTs

¹⁷² Shaheed (n 109) para 68.

¹⁷³ *ibid.*

¹⁷⁴ Olivier De Schutter, 'The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity' (2011) 33 *Human Rights Quarterly* 304, 348.

¹⁷⁵ Draft text art 7.d.

¹⁷⁶ Draft text art 9.4.

¹⁷⁷ Elisa Morgera, Stephanie Switzer and Miranda Geelhoed, 'Study for the European Commission on 'Possible Ways to Address Digital Sequence Information – Legal and Policy Aspects' (December 2019).

The four dimensions of the human right to science can also be linked to the underlying obligations of scientific cooperation underpinning environmental impact assessments and area-based management tools in the BBNJ negotiations, with a view to supporting ocean knowledge co-production. The ILBI could approach existing inequity by providing multilateral institutional approaches and rules that can help to ensure that all States: Can equally share in the benefits from scientific advances that can support ABMTs and EIAs without discrimination; can have an opportunity to contribute to scientific research; can contribute to protect against negative consequences of scientific research or its applications on food, health, security and the environment; and set priorities for scientific research that focus on key issues for the most vulnerable.

Notably, there is a need to include provisions in the ILBI on ‘strategic environmental assessments’, which remain controversial¹⁷⁸ even if CBD Parties have an obligation to carry out SEAs.¹⁷⁹ Strategic assessments would need to consider potential impacts on human rights, as well as opportunities to contribute to the different dimensions of the right to science. This would respond to the need to ensure that networks of MPAs support sustainable use for key services such as harvesting genes for product development by industry, or wilderness areas to protect pristine habitats that provide key ecosystem services for those actors.¹⁸⁰

In addition, support should be provided for advancing research to test the potential outcomes of protecting genetic diversity in multiple, connected MPAs.¹⁸¹ More specific international obligations and standards¹⁸² on environmental impact assessments and strategic environmental assessments, in turn, could support the integration of genetic biodiversity into the planning and decision-making of multiple sectors that may impact and benefit from the ocean genome.¹⁸³ Equally, EIAs should refer to relevant human rights considerations, while currently there are controversial references to more generic ‘interrelated socioeconomic [social and economic], cultural and human health impacts’.¹⁸⁴

4.3. Institutions

¹⁷⁸ Draft text arts 1(13), 21bis(c), and partial brackets in art 28.

¹⁷⁹ Harrison (n 37) 46; CBD art 14(b).

¹⁸⁰ Blasiak and others (n 17) 29.

¹⁸¹ *ibid* 31.

¹⁸² Draft text art 23(3) alt1.

¹⁸³ Blasiak and others (n 17) 30.

¹⁸⁴ Draft text.

The institutional structure to support the implementation of the ILBI needs thus to be conceived also in human rights terms.¹⁸⁵ The reference to ‘needs assessment’ in the current ILBI draft, for instance,¹⁸⁶ should be expanded to an obligation to identify collectively the greatest need for progress in ocean science to support basic economic, social and cultural rights, taking into account ecological connectivity between areas within and beyond national jurisdiction, as well as our evolving understanding of the ecosystem services provided by BBNJ. Thus, the governing body of the ILBI should have the powers necessary to promote an enabling global environment for the inclusive advancement of ocean science and the enjoyment of the benefits of its applications,¹⁸⁷ in the face of the current deep international disparities among countries in science and technology. It should further support States in ensuring access to those applications of scientific progress that are critical to the enjoyment of the right to health and other economic, social and cultural rights; prioritizing allocation of public resources to research in areas where there is the greatest need for scientific progress in health, food and other basic needs related to economic, social and cultural rights, and the wellbeing of the population, especially with regard to vulnerable and marginalized groups.¹⁸⁸ In respectfully integrating TK, it should also ensure respect for the human rights of indigenous peoples and local communities, with a view to sharing equitably the benefits of BBNJ conservation and sustainable use.¹⁸⁹

The proposed scientific and technical body composed of experts from different disciplines (notably integrating social sciences, as underscored by the UN Decade of Ocean Science, for ‘transformative ocean science’),¹⁹⁰ including TK holders,¹⁹¹ could then provide a platform for learning about the actual barriers to the realization of equity and fairness in participating in ocean knowledge production and sharing benefits from ocean science with a view to identifying solutions across scales. The scientific and technical body would then facilitate dialogue with expected beneficiaries, with a view to co-developing integrated responses across a range of actors and different communities of practices involved in the use of MGR and DSI in different sectors. This would be based on shared understanding of changing

¹⁸⁵ For an overview of the institutional options explored so far in the BBNJ negotiations, see Nichola Clark, ‘Institutional Arrangements for the New BBNJ Agreement: Moving beyond Global, Regional, and Hybrid’ (2020) 122 *Marine Policy* 104143.

¹⁸⁶ eg Draft text art 44(4).

¹⁸⁷ ICESCR art 15(4).

¹⁸⁸ UN Doc E/C.12/GC/25, para 52.

¹⁸⁹ Vierros and others (n 33).

¹⁹⁰ Summary of the Implementation Plan of the UN Decade for Ocean Science for Sustainable Development 2021-2030 (2021), 11 and 13.

¹⁹¹ Draft text art 49. This is also supported in the Implementation Plan of the UN Decade for Ocean Science (ibid). Along similar lines, Humphries and others (n 68) 11–12.

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scientific practices, and foster understanding of the different economics underpinning particular sectors and their contributions to BBNJ conservation and sustainable use.¹⁹²

The proposed clearinghouse could also be created in more ambitious terms under the ILBI: Not just as an online repository of information, but as an interactive platform to support concerted and iterative dialogue to map and match to the priorities of beneficiaries in effectively making use of, and contributing to the production of, ocean science for the conservation and sustainable use of BBNJ. This could serve to implement the right to science in terms of setting priorities for the vulnerable, by supporting a focus on ‘high-priority material’ for instance,¹⁹³ and assessing issues leading to discriminatory results in the sharing of information, by monitoring effectiveness through feedback and periodic consultations. In addition, it could serve to provide institutional support for brokering of scientific cooperation, capacity-building and technology-transfer opportunities.¹⁹⁴ This is particularly necessary as ‘a full inventory of national marine science capacity is lacking, as is an inventory of ocean-related [capacity building and technology transfer efforts]’.¹⁹⁵ It could focus initially on non-monetary benefits, with a view to exploring in the interim technological solutions to move towards monetary benefit-sharing, by tackling systematically inter-operability of databases and other online tools, facilitating the sharing of effective capacities and technologies to make use of them, and enhancing opportunities for collaboration can help ensure that all participate in relevant research efforts.¹⁹⁶

5. Conclusions

The BBNJ negotiations present an opportunity to spell out in more detail the duty to cooperate in the conservation and sustainable use of BBNJ in a mutually supportive manner, not only with international biodiversity law, but also international human rights law. Such a policy and legal coherence can also enhance the chances of a new international treaty to contribute synergistically to the realization of several SDGs.¹⁹⁷ To that end, the BBNJ negotiations should prioritize the development of obligations that can contribute to ocean knowledge co-production as an essential path towards transformative ocean governance.

¹⁹² Morgera, Switzer and Geelhoed (n 177).

¹⁹³ International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) Res 3/2015.

¹⁹⁴ Morgera ‘International Legal Concept’ (n 67); Humphries and others (n 68) 4; Rogers and others (n 6) 18.

¹⁹⁵ Vierros and Harden-Davies (n 29) 2.

¹⁹⁶ Morgera, Switzer and Geelhoed (n 177).

¹⁹⁷ Human Rights Council Res 37/24 and 37/25 (2018). Also note the proposal to showcase contributions to the SDGs through the benefit-sharing mechanism of the ILBI in Humphries and others (n 68) 9, and the importance of capacity building for the realization of multiple SDGs in Vierros and Harden-Davies (n 29) 4.

In particular, the ILBI could build on a broad notion of fair and equitable benefit-sharing, which draws both from the ecosystem approach and from the human right to science, to devise more detailed forms of international scientific cooperation across all elements of the package with a view to maximizing its contributions to ocean health and its multiple impacts on human wellbeing. Fundamentally, this will support the agency of countries in the Global South and TK holders in the co-identification of benefits and modalities for advancing ocean science and ocean governance. The ILBI can thus provide detailed processes, criteria and structures for multilateral dialogue and oversight on the multiple equity issues underlying all elements of the BBNJ package with a view to building stronger partnerships for the advancement of knowledge, conservation and sustainable use of marine biodiversity across current capacity disparities.

The human right to science can help to identify and address injustices and power imbalances in the production and use of ocean knowledge, that in turn prevent more effective efforts to conserve and sustainably use BBNJ. The human right to science further serves to clarify that these injustices are considered a matter of international human rights law so States have specific obligations to prevent negative impacts on human rights arising from these power asymmetries in developing the ILBI. This normative understanding provides the rationale and the content for enhanced international cooperation and more defined due diligence obligations to co-develop effective solutions for the conservation and sustainable use of BBNJ through inclusive ocean science. A broadly conceived benefit-sharing process could thus serve to develop clearer rules and an institutionalized approach to critically assess whether information-sharing, capacity building and marine technology transfer lead to non-discriminatory results, prioritize the needs of the vulnerable, and factor in the need to protect against negative consequences of scientific research.

Furthermore, the BBNJ instrument should include obligations that support the co-production of ocean science as a basis for truly joint governance based on shared concepts of scientific collaboration and increased capacities in the Global South and among TK holders to actively participate in transformative ocean conservation and management across scales. To that end, it is necessary to develop an appropriate multilateral institutional structure to identify collectively the greatest need for progress in ocean science to support basic economic, social and cultural rights, taking into account ecological connectivity between areas within and beyond national jurisdiction, as well as our evolving understanding of the ecosystem services provided by BBNJ. These are essential step to ensure compliance with existing international

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obligations on the protection of the marine environment, biodiversity and on human rights, so as to ensure that ILBI serves to realize multiple SDGs.