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SYMPOSIUM ON GOVERNING HIGH SEAS BIODIVERSITY

MARINE TECHNOLOGY TRANSFER UNDER A BBNJ TREATY: A CASE FOR TRANSNATIONAL NETWORK COOPERATION

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Our ability to protect and sustainably use the high seas is ultimately subject to our ability to understand this vast and remote environment. The success of an international legally binding instrument (ILBI) for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) will depend, in part, on utilizing technology to access ocean life, to analyze it, and to implement measures for its conservation and sustainable use. Indeed, technology, broadly defined, is integral to meeting the ILBI's objectives: not just the mandate to address "capacity-building and the transfer of marine technology," but also the sustainable use and conservation of marine genetic resources, the implementation of environmental impact assessments, and biodiversity conservation measures such as area-based management tools.[1] To maximize marine technology deployment to protect marine biodiversity in areas beyond national jurisdiction, transferring technology to developing countries will be critical.[2] Provisions for the transfer of technology, generally from developed to developing countries, are included in many international environmental agreements and declarations,[3] but these provisions have often proven difficult to implement. Part of the difficulty is that the relevant technology is dispersed among states; universities, research institutes and other nonstate actors; and private industry. The particular challenge in crafting an ILBI is, as the European Union has identified, to avoid repeating existing provisions and instead to "focus on added value."[4] One opportunity for an ILBI to add value on technology transfer is to further develop a network model to facilitate marine technology transfer.

This essay examines how an ILBI could contribute to marine technology transfer, a challenge that cuts across many international environmental agreements. It provides an overview of technology transfer provisions in the UN Convention on the Law of the Sea (UNCLOS) and their incomplete implementation to date, before considering the possibilities for technology transfer under the ILBI as an implementing agreement for UNCLOS. Next, the essay considers opportunities to learn from the experience of technology transfer under the UN Framework Convention on Climate Change and the Convention on Biological Diversity, in particular the creation of broad

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[1] *See* Written Submission of the EU and Its Member States: Capacity-Building and Transfer of Marine Technology 2 (January 31, 2017) [hereinafter Written Submission of the EU].

[2] Harriet R. Harden-Davies, *Research for Regions: Strengthening Marine Technology Transfer for Pacific Island Countries and Biodiversity Beyond National Jurisdiction*, 32 Int'l J. Marine & Coastal L. 797, 802–03 (2017).

[3] *E.g.*, Montreal Protocol on Substances that Deplete the Ozone Layer art. 10A, Sept. 14-16, 1987, 1522 UNTS 3 (entered into force Jan. 26, 1989); UN Framework Convention on Climate Change art. 4(5), June 4, 1992, 1771 UNTS 107 (entered into force Mar. 21, 1994).

[4] Written Submission of the EU, *supra* note 1, at 2.

networks of public, private, national, and international organizations to deliver technology transfer. Such decentralized networks can address the shortcomings of prior efforts to support technology transfer, including under UNCLOS, by connecting diverse actors in a fluid and flexible framework that reduces administrative costs while increasing efficiency and responsiveness. The essay concludes that a similar technology transfer network for BBNJ would respond to the need for transnational cooperation in marine technology and would further operationalize existing—and heretofore only partially implemented—UNCLOS technology transfer provisions.

Technology Transfer Under UNCLOS: An Ambitious Framework with Limited Implementation

While many international environmental agreements include provisions for the transfer of technology, there are major differences among them in the degree to which states have operationalized those provisions. UNCLOS, the adoption of which predated most of these environmental agreements, addresses the development and transfer of marine technology in Part XIV.

Under Article 266 of UNCLOS, states are obliged to "cooperate in accordance with their capabilities to promote actively the development and transfer of marine science and marine technology on fair and reasonable terms and conditions," either directly with each other or through competent international organizations.[5] Article 266 also obliges states to "promote the development of the marine scientific and technological capacity of States which may need and request technical assistance in this field, particularly developing States" and to "endeavour to foster favourable economic and legal conditions for the transfer of marine technology for the benefit of all parties concerned on an equitable basis."

Despite providing a "strong conceptual treaty basis" for technology transfer,[6] implementation of the UNCLOS provisions has been relatively limited compared to the technology transfer provisions of other conventions. The adoption in 2003 by the Intergovernmental Oceanographic Commission (IOC) of UNESCO of the "IOC Criteria and Guidelines on Transfer of Marine Technology" (IOC Guidelines) was a key milestone in implementing the requirement, under Article 271 of UNCLOS, of establishing "generally accepted guidelines, criteria and standards for the transfer of marine technology." The IOC Guidelines provide an expansive definition of marine technology, undefined in UNCLOS, as covering "instruments, equipment, vessels, processes and methodologies required to produce and use knowledge to improve the study and understanding of the nature and resources of the ocean and coastal areas."[7] Such marine technology includes information and data; manuals and guidelines; sampling and methodology equipment; observation facilities and equipment; in situ and laboratory equipment; computers and software; and "expertise, knowledge, skills, technical/scientific/legal know-how and analytical methods related to marine scientific research and observation."[8] The IOC Guidelines specify that technology transfer be generally "free of charge, or at a reduced rate for the benefit of the recipient country" and that due regard be given, inter alia, to the rights and duties of holders, suppliers, and recipients of technology.[9]

The IOC Guidelines identify actions that the IOC "should" take in consultation with other relevant organizations, including to "[e]stablish and co-ordinate a clearing-house mechanism for the transfer of marine technology,"

[5] The Intergovernmental Oceanographic Commission is recognized as a competent international organization for Part XIV of UNCLOS. Div. Ocean Affairs & Law of the Sea, 31 Law of the Sea Bulletin 93–95 (1996).

[6] Ronán Long, *Marine Science Capacity Building and Technology Transfer: Rights and Duties Go Hand in Hand Under the 1982 UNCLOS*, *in* Law, Science & Ocean Management 299, 308 (Myron H. Nordquist et al. eds., 2007).

[7] Intergovernmental Oceanographic Commission, IOC Criteria and Guidelines on Transfer of Marine Technology 9 (2003).

[8] *Id.*

[9] *Id.* at 10.

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which would provide information and expertise.[10] The IOC is also supposed to enable states to submit a Transfer of Marine Technology Application, to which the IOC would respond by facilitating contact with technology "donors" or by providing technical assistance more directly[11]—a process similar to that which has already been operationalized, regarding climate change, through the Climate Technology Centre and Network.

IOC implementation of technology transfer has been partial.[12] On the critical question of direct assistance to states, as envisaged in the IOC Guidelines, the Transfer of Marine Technology Application process has not been implemented. The IOC recently acknowledged that "a dedicated [clearing-house mechanism] was not established, due primarily to resource constraints and lack of requests from developing nations."[13] In 2017, the IOC Assembly established the Group of Experts on Capacity Development, which is mandated, inter alia, to "advise the Assembly on, and start implementation of, the Transfer of Marine Technology Clearing House Mechanism."[14] Clearly, there is scope to operationalize technology transfer through an ILBI in a way that is more directly responsive to the technology needs of states, while applying the lessons of other conventions with active technology transfer mechanisms.

Technology Transfer in the BBNJ Preparatory Committee's Report

Marine technology transfer has featured in BBNJ instrument discussions since their inception. The 2017 BBNJ Preparatory Committee report included capacity-building and technology transfer in the points of broad convergence among delegations, and it recommended that technology transfer "[b]e country-driven," be "sustainable," and "[d]evelop marine scientific and technological capacity of States in accordance with Parts XIII and XIV of the Convention."[15] The report additionally proposed that the ILBI text would "make provision for a clearing-house mechanism to perform functions with regard to capacity-building and transfer of marine technology, taking into account the work of other organizations."[16] The section of the report that identifies "issues on which there is divergence of views," however, noted that "further discussions are required on the terms and conditions for the transfer of marine technology."

The intergovernmental conference will have a significant task in shaping the technology transfer provisions of the instrument. However, there are promising indications in the Preparatory Committee report of how the instrument could realistically contribute to technology transfer. In particular, as discussed below, the proposal for a clearing-house mechanism can be elaborated in order to harness the expertise of both public and private sector actors

[10] *Id.* 10–11.

[11] *Id.* at 11–12.

[12] The IOC has noted, as examples of technology transfer activity, initiatives such as the the OceanTeacher training system and the Ocean Biogeographic Information System data repository. IOC Group of Experts on Capacity Development, IOC/GE-CD-1/3, at 63–66 (Mar. 2018).

[13] Ad Hoc Report of the Intergovernmental Oceanographic Commission (IOC) of UNESCO: IOC Strategy on Activities in Relation to Capacity Development and Transfer of Marine Technology, IOC/INF-1347, at 15 (June 17, 2017). In this connection, it is noteworthy that the experience under the UN Framework Convention on Climate Change has been that developing country requests were submitted *after* the establishment of the Climate Technology Centre and Network, with the number of requests increasing with each passing year.

[14] Intergovernmental Oceanographic Comm'n Assembly, Decision IOC-XXIX/10.1 para. (v) (2017). The Group must submit its work to the IOC Assembly in 2019. IOC Group of Experts on Capacity Development, *supra* note 12, at 7.

[15] Report of the Preparatory Committee Established by General Assembly Resolution 69/292, UN Doc. A/AC.287/2017/PC.4/2, at 14 (July 31, 2017).

[16] *Id.* at 15.

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while learning from the experiences of innovative technology transfer mechanisms under existing environmental treaties.

Technology Transfer Through Diverse Networks: Applying the Lessons of Other International Environmental Agreements

Addressing the particular technology needs of a given developing country will often require advice, technical assistance, and access to resources from research institutions, international organizations and private sector firms with specialized expertise, beyond the capacity of any one international secretariat. An example is the combination of on-board vessel monitoring systems, unmanned aerial and underwater vehicles, software to manage and interpret oceanographic data, and other technologies that enable the enforcement of area-based management tools.[17] Nor can technology transfer be confined to North-to-South flows, with a broad array of relevant expertise within developing countries making South-South cooperation essential.[18] Given the reality of technology capacity held at multiple levels in multiple sectors, the challenge for multilateral environmental agreements has become how to orchestrate diverse actors to deliver technology transfer outcomes for parties. Institutionalized networks have become an important mechanism for technology transfer because they enable efficient connections across these diverse actors. This is particularly the case for treaty regimes (such as climate change, biodiversity, and the law of the sea) that are relevant to multiple economic sectors, and for which no single technology or cluster of technologies is sufficient for treaty implementation.

A leading example is the Climate Technology Centre and Network (CTCN) created by the Conference of Parties to the UN Framework Convention on Climate Change (UNFCCC) in 2010 as the implementation body of Convention's Technology Mechanism.[19] The innovative component of the CTCN's design is its network, composed of over 370 organizations with climate technology expertise,[20] which has allowed a small secretariat with limited finances to respond to a growing number of diverse technical assistance requests. The CTCN facilitates technical assistance requests from individual developing countries relating to a broad range of climate technologies, relying on consortium partners (a small group of organizations with sectoral and regional expertise that support the CTCN in its functions) and network members to respond to the requests. By 2017, half of new requests were being directed to the rapidly growing network membership.[21] As of September 2017, eighty-two developing countries had submitted a total of 190 technical assistance requests to the CTCN.[22]

The Centre of the CTCN (co-hosted by UN Environment and the UN Industrial Development Organization) performs clearing-house functions by managing technical assistance requests and responses, and by organizing capacity-building activities. The capabilities to deliver these services come largely from the mobilization of consortium and network members. Notably, the CTCN has operated in the absence of any obligation on developed countries to transfer intellectual property rights (IPRs) to developing countries, even though certain developing countries regularly propose language on IPRs in UN climate negotiating sessions. This indicates that such a technology transfer mechanism can function in the absence of party consensus on rights management. Following the

[17] Nai'a Lewis et al., Large-Scale Marine Protected Areas: Guidelines for Design and Management 80 (2017).

[18] UN Framework Convention on Climate Change Technology Executive Committee, South–South Cooperation and Triangular Cooperation on Technologies for Adaptatation in the Water and Agriculture Sectors (June 2017).

[19] UN Framework Convention on Climate Change, Report of the Conference of the Parties, UN Doc. FCCC/CP/2010/7/Add.1 (Mar. 15, 2011) (Decision 1/CP.16, para. 117).

[20] Joint Annual Report of the Technology Executive Committee and the Climate Technology Centre and Network for 2017, UN Doc. FCCC/SB/2017/3, at para. 77 (Sept. 2017).

[21] *Id.* at para. 94.

[22] *Id.* at para. 93.

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establishment of the CTCN, in 2014 a similar institution—the Bio-Bridge Initiative—was established for the Convention on Biological Diversity and its Protocols.[23]

A network mechanism, incorporating CTCN design features, could be included in the ILBI text as an initiative capable of genuine and relatively speedy implementation. Following the experience of the CTCN, such a network would operate in direct response to state party requests, following the Preparatory Committee mandate of a "country-driven" approach. The technical assistance request model would be consistent with UNCLOS's approach of promoting capacity in requesting states and could build on the IOC Guidelines' Transfer of Marine Technology Application and Transfer of Marine Technology Project concepts.

Most significantly, such a network would have the capacity to be an enhanced clearing-house mechanism, serving not just as a central repository of information but also in a "match-making" role, connecting requesting states with expert network members to provide tailored advice on marine technology. This would address the long-identified problem of how to "match available assistance with capacity needs."[24] As with the CTCN, the success of a BBNJ technology transfer network would depend, in large part, on the organizations that it could attract as participants.

As the foregoing discussion has indicated, technology transfer is an objective that cuts across multiple international environmental agreements and processes. The implementation of technology transfer through an ILBI would be assisted by cooperative and complementary interaction with other regimes. To maximize effectiveness, the BBNJ mechanism could explore linkages with other relevant UN technology processes, such as the Technology Facilitation Mechanism (TFM, launched in 2015 as part of the 2030 Agenda for Sustainable Development),[25] the Technology Bank for Least Developed Countries,[26] and the technology transfer work under the International Maritime Organization relating to energy efficiency of ships.[27] Here, too, the prior experience of the Climate Convention is instructive. UN Environment has regularly attended UNFCCC Technology Mechanism meetings and has provided briefings on the operationalization of the TFM, while the UNFCCC is a member of the Inter-Agency Task Team of the TFM. In addition, the CTCN has shared its experiences with the more recently established Bio-Bridge Initiative. Such formal and informal linkages can be of great benefit to initiatives with similar structures and objectives.

Conclusion

Conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction is a goal of immense significance. It is therefore in our collective interest that the technological capacity of all states to contribute to conservation and sustainable use is maximized. UNCLOS and the IOC Guidelines contain significant aspirations for technology transfer, but implementation has been limited. Now, with an ILBI in prospect, there is an opportunity to set in place effective arrangements for technology transfer in respect of BBNJ.

Enabling effective and efficient technology transfer will take concerted transnational cooperation. The nature of marine biodiversity, and the experience of other international environmental agreements, is such that technological capacity is broadly distributed among national, international, public, private, and indeed hybrid actors. An institutional network is an appropriate mechanism to harness these capacities. The CTCN has demonstrated the

[23] *About the Bio-Bridge Initiative*, Convention on Biological Diversity.

[24] Secretary-General, Oceans and the Law of the Sea, UN Doc. A/66/70, at para. 199 (Mar. 22, 2011).

[25] *Technology Facilitation Mechanism*, UN Sustainable Dev. Knowledge Platform.

[26] *Technology Bank for Least Developed Countries*, UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

[27] *Technical Co-operation (TC)*, Int'l Maritime Org.

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feasibility of this approach, and a similar structure is being implemented under the Convention on Biological Diversity. The establishment of a marine technology network would add practical capacity to an ILBI clearing-house mechanism and could well become a valuable instrument for the protection of the high seas. Moreover, a network mechanism could develop cooperative linkages with the institutionalized networks of other international environmental agreements, thereby countering regime fragmentation and strengthening respective capacities to fulfill complementary mandates.

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