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Rio+20: Indigenous Knowledge and Intellectual Property in Coastal and Ocean Law

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INTRODUCTION

1992 was a golden year for indigenous knowledge.¹ For most practical purposes, the subject of indigenous knowledge was effectively inducted into the corpus of international environmental law via the Rio package of international environmental law instruments.² Coupled with preceding developments in other regimes, Rio provided a framework for the charting, continued elaboration, and embedding of indigenous knowledge onto the normative platform of international environmental law. This contribution will explore the extent to which indigenous knowledge has been advanced as a result of the 1992 Rio Earth Summit and the 2002 Johannesburg World Summit on Sustainable Development (WSSD), with specific interest in relevant developments around coastal, ocean and marine environmental law in general as the international community returned to Rio in 2012 (Rio+20),³ twenty years after the first Rio Earth Summit.⁴

† The author acknowledges with profound gratitude the research assistance provided by Dr. Teshager W. Dagne and Alessandra Toteda. He also thanks the anonymous reviewers of this article for their editorial support and helpful comments. The author takes responsibility for any errors and omissions hereto.

1. In this article, the term indigenous knowledge is used interchangeably with traditional or Aboriginal knowledge. It is a loose reference to the knowledge forms associated with all categories of peoples recognized as indigenous, Aboriginal and local communities or their corresponding representations in domestic and international law.

2. See C. Oguamanam, "Biodiversity," in *Routledge Handbook of International Environmental Law*, S. Alam et al., eds., (London: Routledge, 2012), Chap. 12.

3. Convened pursuant to UN General Assembly Resolution 64/236 (A/RES/64/236) in Rio de Janeiro, Brazil on 20–22 June 2012 to mark the 20th anniversary of the 1992 UNCED in Rio de Janeiro, on the heels of the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa. The focus of this essentially political convention was on fashioning strategies to build a green economy in pursuit of sustainable development, poverty eradication, strengthening the capacity of developing countries to embrace and implement a greener development framework; and, overall, improving international coordination efforts toward sustainable development in accordance with the precursor UNCED (1992) and WSSD (2002). See *The Future We Want*, being the outcome declaratory statements of Rio+20, UN Doc A/CONF.216/L.1 para. 43 (outlining the need for incorporation of indigenous peoples, among others, in the sustainable development agenda) [*The Future We Want*].

Discourse on indigenous knowledge is also one of resource control, equity, access, and broader knowledge governance; even in the ocean and coastal contexts. Consequently, the present task is undertaken on the basis of the binary interface between indigenous knowledge and intellectual property and, in regard to the inherent regime overlap, the intersecting and multi-jurisdictional issue linkages implicated in the concept of indigenous knowledge. It affords opportunity to reflect on the state of progress and challenges that straddle law and policy around coastal and ocean governance and marine environmental initiatives as they implicate indigenous knowledge and other embedded regimes. It also offers a chance for modest speculation in regard to future directions and in response to global systemic change and particular, albeit unfolding, challenges going forward.

THE RIO INTERNATIONAL ENVIRONMENTAL INSTRUMENTS AND INDIGENOUS KNOWLEDGE

The first Rio Earth Summit resulted in two legally binding instruments and three soft law documents. The latter are: i) The Rio Declaration on the Environment and Development (Rio Declaration),⁵ which is a broad statement of fundamental principles for negotiating the interface between environment and development, ii) Agenda 21,⁶ which is a strategic policy roadmap for global environmental sustainability for the 21st century, and iii) The Forest Principles,⁷ which is a specialized statement of principles that undergirds a sustainable approach to forest management. Taken together, the aforementioned instruments provide a broad platform of principles that would enrich specific legal and diverse environmental regulatory regimes both for the future and in regard to the implementation of pre-existing laws and policies on the environment.

4. More formally known as the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 3–14 June 1992. WSSD is also known as “Rio+10” because it was convened to mark a decade of the commitments made under the first Rio Earth Summit in 1992. For the outcome of Rio+10, see Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20, adopted on 4 September 2002, available online: <http://www.un.org/esa/sustdev/documents/WSSD.../WSSD_PlanImpl.pdf>.

5. *Rio Declaration on Environment and Development*, UN Doc. A/CONF.151/5/Rev.1, adopted on 13 June 1992, available online: <<http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163>><http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163>>.

6. Agenda 21, UN Doc. A/CONF.151/26/REV.1, adopted on 14 June 1992, available online: <<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=52&ArticleID=50>>.

7. Formally known as the Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests, UN Doc. A/Conf.151/26 (Vol. III), Annex III (13 June 1992), available online: <<http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>>.

The two legally binding treaties developed at the first Rio Earth Summit are: i) the Convention on Biological Diversity (CBD)⁸ and, ii) the United Nations Framework Convention on Climate Change (UNFCCC).⁹ These two instruments, as well as virtually all of the soft law components of the Rio Package of international environmental instruments, speak in some way to the subject of indigenous knowledge. But the degree to which such accommodations apply or extend to coastal or ocean regimes remains inchoate for the most part. Attempts to clarify the conceptual and jurisdictional ambiguities in this area constitute an exercise in complex regime analyses, the contours of which transcend the Rio instruments and include other ex-Rio regimes, notably the Law of the Sea Convention (LOSC) and the Vienna Convention on the Law of Treaties.¹⁰

Atypical of major instruments on indigenous knowledge, Agenda 21 directly associates indigenous peoples with, as well as limits them to, the terrestrial environment.¹¹ It leaves, at best, a rather vague impression in regard to the relevance of indigenous knowledge in the context of the high seas and oceans; arguably less so in regard to the coasts. However, the general language of Chapter 26 associates indigenous knowledge with natural resources and the environment,¹² which are primarily inclusive of oceans, coastal and marine resources.

In the specific contexts of coasts and oceans, Chapter 17 of Agenda 21 is dedicated to “the protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas and coastal areas and the protection, rational use and development of their living resources”. The Chapter recognizes that more than 60 percent of the global population live within 60 km of the shore line – a percentage that is projected to reach 75 percent by 2020. It also acknowledges that: “Many of the world’s poor [including indigenous peoples] are crowded in coastal areas [and that] Coastal resources are vital for many local communities and indigenous people.”¹³ Chapter 17

8. *United Nations Convention on Biological Diversity*, 5 June 1992, 30619 *United Nations Treaty Series*, entered into force 29 December 1993 [CBD].

9. *United Nations Framework Convention on Climate Change*, 9 May 1992, 31 *International Legal Materials* 849, entered into force 31 March 1994; see also *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 11 December, 1997, 2303 *United Nations Treaty Series* 162 entered into force 16 February 2005.

10. *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 *United Nations Treaty Series* 3; 21 *International Legal Materials* 1261, entered into force on 16 November 1994 [LOSC]; *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 *United Nations Treaty Series* 331, entered into force 27 January 1980.

11. For example, Chapter 26(1) provides in part, “In the context of this chapter the term “lands” is understood to include the environment of the areas which the people concerned traditionally occupy.” There is no definition of the word “occupy” in the instrument. See also Principle 22 of the Rio Declaration which is the heart of the instruments’ provision on indigenous knowledge.

12. Agenda 21, Chapter 26(1) recognizes that indigenous peoples have “developed over many generations a holistic traditional scientific knowledge of their lands, natural resources and environment,” Agenda 21, n. 6 above, Chap. 26(1).

13. *Id.*, Chap. 26(3).

provides an elaborate agenda and features a commitment of states toward integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction. One of the core strategies for implementing most of the commitments on oceans and coasts pursuant to Rio, and in particular under Agenda 21 on oceans and coasts, is the facilitation of access to information and extension of opportunities for participatory engagement of all stakeholders, including indigenous peoples, in policy planning and decision making.¹⁴

Consultations with indigenous and local communities as resource user groups, knowledge and general stakeholders are an integral component of the pivotal commitments, pursuant to Chapter 17, for integrated management and sustainable development of coastal and marine areas and their resources.¹⁵ Along with other stakeholders, indigenous and local communities are targets for education and training in integrated management and sustainable development of the marine environment and its resources. These training programs and overall sustainable development implementation strategies are required to give regard to traditional ecological knowledge and socio-cultural considerations, including the special status of local and indigenous small-scale artisanal fishers, fishworkers, women, their right to habitat utilization and protection within the ethics of sustainability.¹⁶ In this regard, systems are encouraged for the acquisition and recording of traditional knowledge of marine living resources and strategies for the improvement of such knowledge, its dissemination and incorporation into integrated management and sustainable development of the coastal and marine environment in general, and for the improvement of the capacity of countries in the field of sustainable development.¹⁷

Since 1992, pursuant to the elaboration of Chapter 17 of Agenda 21, the implementation of commitments on the protection and management of oceans and marine genetic resources has built on relevant pre-existing and concurrent regimes. Notably, those include the LOSC, especially via the United Nations Informal Consultative Process (ICP) on Oceans and the Law of the Sea,¹⁸ and the CBD, especially through the latter's program of work on marine and coastal biological diversity. In addition to a number of significant outcomes associated with these initiatives, the 2002 WSSD and Rio+20 urged the ratification and implementation of relevant instruments to enhance commitment on oceans and coastal resource management.¹⁹ The WSSD, rather than Rio+20, provided impetus and underscored the urgency for the consolidation of the regime and regulatory proliferation on the

14. *Id.*, Chap. 26(5)(f).

15. The same sentiments are expressed in Principle 22 of the Rio Declaration.

16. See Agenda 21, n. 6 above, Chaps. 17(74b), 17(80), 17(81)(a)(b)(c).

17. *Id.*, Chaps. 17(81)(d); 17(94)(b); 17(99)(b); 17(136).

18. See n. 84 below.

19. The instruments include the LOSC, the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystems, and the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity.

management of oceans and marine genetic resources. The Rio+10 Summit also provided impetus for an integrated ecosystems approach, and for a multidisciplinary, multi-sectoral coastal and ocean management system at various levels.

The theme of an integrated, multi-sectoral, and multidisciplinary approach unveils gaps in the LOSC and the CBD approach to the management of coastal and marine areas and their resources, which have been the subject of intense analytical interest discussed below. Those gaps in turn expose the need for a purposeful, conciliatory approach of the two regimes under an integrated platform, especially in regard to the issue of indigenous knowledge and intellectual property. Meanwhile, a rough sketch of CBD's role in the positioning of indigenous knowledge within the context of the emergent integrated management and sustainable development of coastal and marine genetic resources (MGRs) and environment would assist in the evaluation of the progress in these areas ahead of Rio+20.

Consistent with paragraph 22 of the Rio Declaration and Chapter 26 of Agenda 21, Article 8(j) of the CBD provides as follows:

Each Contracting Party shall as far as possible and as appropriate ... [s]ubject to its national legislation, respect, preserve and maintain knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and *promote their wider application* with the approval and involvement of the holders of such knowledge, innovations and practices and encourage equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices.²⁰

The CBD is a key influential instrument for the protection of indigenous knowledge.²¹ Since its inception two decades ago, it has served as the platform upon which significant and practical strides for normative elaboration of indigenous knowledge have occurred. However, conservative interpretation of the CBD's jurisdictional limitations to national boundaries and fundamental but questionable conceptual narrowing of indigenous knowledge to biological diversity and resources within the terrestrial sphere have constrained the application of indigenous knowledge in coastal and marine areas.²²

20. Emphasis added.

21. This is despite the specialized tenor of instruments like the ILO Convention No. 169 of 1989 ((1989) 28 *International Legal Materials* 1382) and the United Nations Declaration on the Rights of Indigenous Peoples (GA Res. A/61/295, 107th Plenary Meeting, (2007) [UNDRIP]).

22. See C. Oguamanam, "Genetic resources and access and benefit sharing: Politics, prospects and opportunities for Canada after Nagoya," *Journal of Environmental Law and Policy* 22, no. 2 (2011): 87–124 [Genetic Resources & Access and Benefit Sharing] (discussing the narrow focus of CBD and its emphasis on plant and animal genetic resources and consequential bias for terrestrial biodiversity).

In 2000, CBD efforts culminated in the Bonn Guidelines on access to genetic resources and the fair and equitable sharing of the benefits arising from their utilization.²³ According to the CBD, the Bonn Guidelines represent a “useful first step of an evolutionary process in the implementation of relevant provisions of the Convention related to access to genetic resources and benefit-sharing.”²⁴ In accordance with the CBD’s expectations, the Guidelines have been the subject of progressive refinements and debates even outside the CBD, and have since constituted the basis for relevant developments within and outside the Convention. This is especially true in regard to traditional knowledge, a development that climaxed in 2010 with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity.²⁵

Nearly a decade-long transformation of the Bonn Guidelines into the Nagoya Protocol resulted in the induction of key elements of the Bonn Guidelines in other regimes, especially in debates over indigenous knowledge, intellectual property, and trade and resource control.²⁶ The Bonn Guidelines and the CBD did not originate in isolation. The CBD’s environmental orientation is premised on the link between indigenous knowledge and sustainable environment development, especially through biodiversity conservation, which of course includes marine and coastal biodiversity. It entrenches an incentivization scheme for indigenous knowledge holders for their invaluable contribution to biodiversity conservation. The CBD recognizes the disequilibrium in the appropriation of the benefits of genetic resources (not excluding marine and coastal genetic resources), and by extension, biological diversity.

Characteristically, these resources are abundant in the global south and areas of indigenous and local communities elsewhere, which are generally recognized as centres of biodiversity.²⁷ However, through bioprospecting and appropriation

23. See *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, COP 6 Decision VI/24 (Sixth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, the Hague, 7–19 April 2002) [Bonn Guidelines].

24. *Id.*

25. *The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity*, opened for signature on 2 February 2011, Annex 1 to CBD COP 10. Agenda item 3.

26. Under the World Intellectual Property Organization’s Patent Agenda, which seeks global harmonization of patent systems via the revisions of existing international patent treaties, the issue of access and benefit sharing and disclosure of source of origin of genetic resources remain contentious between developed and developing countries. The same is also the case in the ongoing negotiations at WIPO via the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. See generally E. Arezzo, “Struggling around the ‘natural divide’: The protection of tangible and intangible indigenous property,” *Cardozo Art and Entertainment Law Journal* 25 (2007): 367–415.

27. See C. Oguamanam, *International Law and Indigenous Knowledge: Intellectual Property, Plant Biodiversity and Traditional Medicine* (Toronto: University of Toronto Press, 2006), p. 23.

practices known as biopiracy, second comers attempt to deploy a new global intellectual property order to access these resources and to undermine indigenous knowledge associated thereto.²⁸ CBD's intervention symbolizes an attempt to mitigate tension over indigenous knowledge and biodiversity conservation by entrenching a culture of fairness and equity (through access and benefit sharing) and, to some extent, to seek the calibration of intellectual property's role in aid of environmental law and policy.

In its very elementary rendition, the multi-faceted link between these concepts is evident on a number of grounds. First, indigenous (ecological) knowledge evolves from indigenous and local communities' dependence, first on the land, and then on their rich biological resources and heritage which constitute the core of their environmental ethics, world views, and knowledge production.²⁹ Second, while indigenous knowledge is generally regarded as an outlier in the intellectual property system, formal scientific approaches to the environment and knowledge production are recognized by that system.³⁰ Third, consequently, through the use of intellectual property, especially patents, both the abundant genetic resources in indigenous and local communities and the associated local knowledge systems constitute a target for appropriation by stakeholders operating outside the indigenous and local communities' arenas. Intellectual property and indigenous knowledge are easy flash points of binary opposition and, depending on the orientation, mutual re-enforcement as recognized under Article 16(5) of the CBD.³¹

The need for a knowledge governance or protection scheme, whether under conventional intellectual property rules or a *sui generis* scheme designed to empower indigenous knowledge as a counterpoise for biopiracy and prevailing epistemological disincentive for the role of indigenous knowledge in biodiversity conservation, has continued to shape both environmental law and policy.³² It has also influenced

28. For a treatise on biopiracy, see I. Mgbeoji, *Global Biopiracy: Patents, Plants and Indigenous Knowledge* (Vancouver: UBC Press, 2005).

29. See generally M. Battiste and J.S. Henderson, *Protecting Indigenous Knowledge: A Global Challenge* (Saskatoon: Purich, 2000).

30. On the marginalization of indigenous knowledge in the conventional intellectual property system, see G. Dutfield, "TRIPS-related aspects of traditional knowledge," *Case Western Reserve Journal of International Law* 33 (2001), p. 223; C.R. McManis, ed., *Biodiversity and the Law: Intellectual Property, Biotechnology and Traditional Knowledge* (London: Earthscan, 2007).

31. The Article provides as follows: "The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives."

32. For examples of the discourses of a *sui generis* form of intellectual property, see P. Drahos, "Indigenous knowledge, intellectual property and biopiracy: Is global collecting society the answer?," *European Intellectual Property Review* 22 (2000): 245–250, p. 245; I. Mgbeoji, "Patents and traditional knowledge of uses of plants: Is a communal patent regime part of the solution to the scourge of biopiracy?," *Indiana Journal of Global Legal Studies* 9 (2001): 163–186, p. 163.

the broader narrative of indigenous peoples' rights within the international human rights framework, to which we shall return shortly. The CBD directly speaks to these tensions as it seeks their mitigation. For example, paragraph 12 of its preamble recognizes:

the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components.

Specifically, CBD's third objective is direct on the point of fair and equitable sharing of the benefits arising from the utilization of genetic resources.³³

Through the commitment of the CBD signatories, the issue of indigenous knowledge protection is now pursued as a trans- and multi-regime project. In part, this is as a result of the ubiquitous ambit of indigenous knowledge subject matters in environmental, socio-economic, cultural, political, and overall development contexts. For example, the deafening, albeit disputed, silence of the World Trade Organization (WTO) system through the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) on the subject of indigenous knowledge turns out to be a blessing in disguise.³⁴ According to analysts, in a counterintuitive way, TRIPS' (and by extension the WTO's) omission of indigenous knowledge on the global trade regulatory radar provided the impetus and pressure for the escalation of sites or fora for addressing the subject.³⁵ Such fora include the CBD, the Food and Agriculture Organization, the World Health Organization, UNESCO, and the World Intellectual Property Organization (WIPO) – through various ongoing deliberations on patent reform and perhaps most importantly, via the ongoing work of the WIPO's

33. CBD, n. 8 above, Article 1.

34. Article 27 of the TRIPS Agreement which spells out the criteria for patentable subject matter neither makes reference to indigenous knowledge nor overtly excludes it. Rather, there is a wiggle room under Article 27 for State Parties to accommodate indigenous knowledge. For example, reference to extension of patents to all fields of technology and to a *sui generis* system of protection in regard to plant varieties are leverages through which desiring states could incorporate indigenous knowledge under the TRIPS. See *Agreement on Trade-Related Aspects of Intellectual Property Rights*, 15 April 1994, 1869 *United Nations Treaty Series* 299, Article 27 (3) [TRIPS].

35. According to Peter Yu and Laurence R. Helfer, the proliferation of fora for addressing the indigenous knowledge question accounts for what has been termed the intellectual property regime complex. P.K. Yu, "International enclosure: The regime complex and intellectual property schizophrenia," *Michigan State Law Review* 1 (2007): 1–33; L.R. Helfer, "Regime shifting: The TRIPS agreement and new dynamics of international intellectual property lawmaking," *Yale Journal of International Law* vol. 29, (2004): 1–83; C. Oguamanam, "Regime tension in the intellectual property arena: Farmers' rights and post-TRIPS counter regime trends," *Dalhousie Law Journal*, 29 (2006): 413–453.

Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC).³⁶

Since 2000, the IGC has progressively engaged in the project of text-based negotiations designed to consummate an agreement on international legal instruments for comprehensive and effective protection of traditional knowledge in its diverse manifestations including the contexts of genetic resources, cultural expressions, or expressions of folklore.³⁷ In addition to improved participation of indigenous peoples in these fora, a notable feature of developments in these contexts is the penetration and entrenchment of the elements and language of the Bonn Guidelines. These developments also highlight the uptake and awareness of the role of indigenous knowledge in diverse sites of innovation, and the importance of the access and benefit sharing mechanism as a key strategy for equity and justice and for entrenchment of the ethics of sustainable development. As marine genetic resources and knowledge assume increased importance, all of these considerations or features are fundamental in negotiating, understanding, and ensuring the sustainability of relevant indigenous knowledge in the context of ocean law and governance.

Human Rights Roots of Indigenous Knowledge

Perhaps more than the latter day elaborations of indigenous knowledge in the specific contexts of environmental law, ethics, and resource control, the consciousness of indigenous knowledge has roots in the political context of colonial relations and human rights.³⁸ Indigenous knowledge, in its holistic outlook, implicates self-determination in its open-ended jurisprudential elaboration as the gravamen of indigenous people's rights.³⁹ As a fundamental component of self-determination, indigenous knowledge was at the heart of the resistance of indigenous peoples and colonized non-western "others" to the colonial hierarchies of culture and power that treated them, and their knowledge systems (including environmental ethics

36. See *Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore*, available online: <<http://www.wipo.int/tk/en/igc/>>.

37. *Id.*

38. See J. Anaya, *Indigenous Peoples in International Law*, 2nd ed. (New York: Oxford University Press, 2004); D. Sanders, "The re-emergence of indigenous questions in international law," *Canadian Human Rights Year Book*, 3 (1983).

39. A representation provision of self-determination under the International Bill of Rights is exemplified in Article 1 of the International Covenant on Civil and Political Rights: "All peoples have the right of self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development." *International Covenant on Civil and Political Rights*, 19 December 1966, 999 *United Nations Treaty Series* 171 *Canadian Treaty Series* 1976 No. 47, 6 *International Legal Materials* 368, entered into force 23 March 1976 [ICCPR]; see also, *International Covenant on Economic, Social and Cultural Rights*, 16 December 1966, 993 *United Nations Treaty Series* 3, *Canadian Treaty Series* 1976 No. 46, entered into force 3 January 1976, Article 1; UNDRIP, n. 21 above, Article 3.

and innovation practices) with disdain within the broader context of racial discrimination.⁴⁰

Attempts to address the relationship between indigenous peoples and colonial powers from the human rights paradigm started not too long after the onset of colonial encounters.⁴¹ However, more concrete steps and results from the processes can readily be seen, albeit conveniently for observers, from the middle to the latter part of the 20th century. The combination of the global political crisis of that era,⁴² and the inception of the twin revolutions in digital technology and biotechnologies (especially in the late 20th century) had a significant impact on indigenous and colonized peoples. Not only did these developments make indigenous and colonized peoples subjects of human rights abuses, it also made their knowledge systems and natural resources targets of unprecedented appropriation.⁴³ This state of affairs underscored the urgency to fast-track progress in the area of protection and promotion of indigenous peoples' rights, especially their knowledge systems.⁴⁴ Several efforts in that regard crystallized across diverse regime contexts in the UNDRIP.⁴⁵

Building upon many other significant background studies, instruments, initiatives, and programs,⁴⁶ and notably the international bill of rights,⁴⁷ the UNDRIP, according to James Anaya,

40. According to analysts, racial discrimination is one of the entry points of indigenous peoples' issues into international human rights law and policy. Sanders, n. 38 above; see also C. Oguamanam, "Indigenous peoples and international law: The making of a regime," *Queens Law Journal* 30 (2004): 348–399, p. 365; see generally the United Nations Convention on the Elimination of All Forms of Racial Discrimination, 21 December 1965, 660 *United Nations Treaty Series* 195, 5 *International Legal Materials* 352, entered into force on January 4, 1969.

41. Sanders, n. 38 above.

42. Notably World War II. See K. Nunes, "'We can do ... better': The rights of indigenous peoples and the United Nations Declaration on the Rights of Indigenous Peoples," *St Thomas Law Review* 7 (1995): 521–556.

43. On the paradoxical role of new information technologies for the protection and appropriation of indigenous knowledge, see C. Oguamanam, *Intellectual Property in Global Governance: A Development Question* (London/New York: Routledge, 2012), pp. 185–191.

44. See L.R. Helfer, "Human rights and intellectual property: Conflict or co-existence," *Netherlands Intellectual Property Quarterly*, 22 (2004): 67–179 (arguing that as a human rights issue, the historical global negligence of indigenous knowledge is one of the key triggers for the intersection between intellectual property and human rights).

45. For example, through the United Nations human rights system, pursuant to the international bill of rights and the human rights processes of the United Nations. See generally, L.R. Helfer and G.W. Austin, *Human Rights and Intellectual Property: Mapping the Global Interface* (New York: Cambridge University Press, 2011).

46. For example, see E. Daes, Study on the Protection of Cultural and Intellectual Property of Indigenous Peoples, study commissioned by the ECOSOC (Sub-Commission on Prevention of Discrimination and Protection of Minorities), Doc. No. E/CN.4/SUB.2/1993/28, 1993; see also M. Cobo, "Study of the Problem of Discrimination Against Indigenous Populations," UN Doc. E/CN.4/Sub.2.1986/7 Add 4, UN sales No. E.86.XIV.3.3 (1986).

47. The Universal Declaration of Human Rights; the International Covenants on Civil, Political Rights and the International Covenant on Economic, Social and Cultural Rights and optional protocols thereto.

[r]eflects the existing international consensus regarding the individual and collective rights of indigenous peoples in a way that is coherent with, and expands upon, the provisions of ILO Covenant No. 169, as well as with other developments, including the interpretation of other human rights instruments by international bodies and mechanisms. As the most authoritative expression of this consensus, the Declaration provides a framework of action towards the full protection and implementation of these rights.⁴⁸

The UNDRIP remained in draft form for about 15 years within the slowly grinding mill of the UN system.⁴⁹ But pending its adoption, important strides on indigenous issues, including recognizing the importance of their knowledge system, were recorded within the UN system. This is evident in the establishment of the United Nations Permanent Forum on Indigenous Issues (UNPFII).⁵⁰ The Forum is an advisory body to the UN Economic and Social Council on indigenous specific issues in regard to socio-cultural, development, environmental, human rights challenges with a view to seeking their integration within the broader agenda of the UN system. Also, the then UN Human Rights Commission appointed a Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous peoples since 2001.⁵¹ The Rapporteur's mandate was renewed following the adoption of UNDRIP in 2007 to, among other things, work in close cooperation with the UNPFII and to promote the UNDRIP and international instruments relevant to the rights of indigenous peoples.⁵² That same year, the Human Rights Council established the Expert Mechanism on the Rights of Indigenous Peoples (EMRIP) to provide the Council,⁵³ on request, research-based advice on specific thematic issues relating to the rights of indigenous peoples. The second study of EMRIP in 2011 explored the right of indigenous peoples to participate in decision making. Taking into

48. See J. Anaya, *Report of the Special Rapporteur on the Situation of Human Rights and Fundamental Freedoms of Indigenous Peoples*, Human Rights Council, ninth session, agenda item 3, UN Doc. A/HRC/9/9 (2008), para. 43; also Helfer and Austin, n. 45 above, p. 443.

49. The document was first released in draft form in 1993 and was signed 14 years later in 2007.

50. See "Permanent Forum: Origin and Development," available online: <<http://social.un.org/index/IndigenousPeoples/AboutUsMembers.aspx>>.

51. See UN Human Rights (Office of the High Commissioner for Human Rights), Special Rapporteur on the Rights of Indigenous Peoples, available online: <<http://www.ohchr.org/EN/Issues/IPeoples/SRIndigenousPeoples/Pages/SRIPeoplesIndex.aspx>>.

52. See Resolution 6/12 of the UN Human Rights Council on Human Rights of Indigenous Peoples: Mandate of the Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous peoples, adopted September 28, 2007, available online: <http://ap.ohchr.org/documents/E/HRC/resolutions/A_HRC_RES_6_12.pdf>.

53. Via Resolution 6/36. For a general overview of the EMRIP, see UN Human Rights (Office of High Commissioner on Human Rights), The Expert Mechanism on the Rights of Indigenous Peoples, available online: <<http://www.ohchr.org/EN/Issues/IPeoples/EMRIP/Pages/EMRIPIndex.aspx>>.

consideration EMRIP's ongoing studies and activities so far, it is not an unlikely proposition that coastal and oceans law governance could soon be on its radar.⁵⁴

The UNDRIP takes a holistic approach to indigenous peoples' rights. Notably, the symbiotic relationship between those rights and indigenous knowledge in its various manifestations is palpable in the document. Further, the rootedness of indigenous peoples and their knowledge systems with the land is also quite prominent. Consequently, its treatment of indigenous rights, including knowledge and resource rights in the context of oceans and marine environmental resources, reflects an understandably low profile. After all, in comparison to plant and animal resources or various forms of terrestrial biodiversity, knowledge of the resources of the deep oceans is as modest in indigenous circles as in other epistemic alternatives.⁵⁵

Nonetheless, a constructive reading of the UNDRIP uncovers significant accommodation for, and a reification of, the relevance of indigenous peoples' interests, including the right to their knowledge and natural resources within and without the oceans, coastal and general marine environments. First, the UNDRIP affirms all aspects of indigenous interests in other international instruments.⁵⁶ Second, it upholds the control and protection of indigenous peoples' interests, including conservation, environmental protection, and exploitation over their natural resources (without discrimination as to the latter's geographic location) as integral aspects of indigenous development aspirations.⁵⁷ Third, the Declaration recognizes that indigenous knowledge makes positive contributions to environmental sustainability and equitable development.⁵⁸ Fourth, it affirms the diversity of national and regional peculiarities in regard to the ecological and geographical locations of various indigenous communities and the accompanying challenges in specific cases.⁵⁹ Fifth, it seeks to safeguard and compensate indigenous peoples for actions that could have real or potential negative consequences for access to their natural resources or the right to live in their ancestral territories.⁶⁰ Sixth, the UNDRIP

54. For instance, a part of the ongoing studies of the EMRIP for 2012 includes strategies by states to attain the objectives of the UNDRIP. Perhaps more relevant to the present context, EMRIP advanced its 2011 agenda further in 2012 by focusing on the right of indigenous peoples to participate in decision making in the context of extractive industries. This study would no doubt be relevant in any future initiative that could consider the same proposition in the area of coastal or marine genetic resources.

55. Oguamanam, n. 22 above.

56. UNDRIP, n. 21 above, Article 37(2); see also preamble, para. 8. These include several international instruments dealing with oceans, coasts and marine environments and sustainable development, notably the LOSC.

57. *Id.*, Articles 29.

58. *Id.*, Preamble, para. 11.

59. *Id.*, Preamble, para. 23. Different ice-inhabiting Inuit communities in Canada's North have deep knowledge of specific or peculiar ice conditions of their individual territories and also knowledge of overlapping conditions across their respective traditional territories.

60. *Id.*, Article 8(2)(b) and (c).

secures indigenous peoples' taxonomic claims, and identity in relation to their own communities, places, persons and, of course, phenomena.⁶¹ Seventh, the status of indigenous peoples as vulnerable members of the human family and their right to prior informed consent and to "participate in every decision that affects them, especially those relating to the development, utilization or exploitation of mineral, water and other resources" is recognized under the UNDRIP.⁶² Eighth, as with their distinct claims to spiritual and other affiliations to land, indigenous rights are preserved in regard to waters and coastal seas and other resources.⁶³ Ninth, in direct and indirect ways the UNDRIP seeks to secure indigenous or traditional knowledge, "sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of properties of fauna and flora ... [and indigenous peoples' right] to maintain, control, protect and develop their intellectual property" in these and other regards.⁶⁴ Finally, indigenous interests and claims in regard to the future, which unequivocally include anticipated new frontiers (not excluding the realm of marine scientific research and marine genetic research (MSR/MGRs)) in economic, political, social, cultural, scientific, and technological developments, are preserved.⁶⁵

The above outline of the UNDRIP is deliberately tailored to tease out the extent to which its provisions touch on the relevance or interface between indigenous knowledge and marine, coastal, and oceans law commitments of states, especially those deriving from post-1992 international environmental law commitments and implementation strategies by the state Parties. Most of these provisions address the rights of indigenous peoples, as peoples, as opposed to indigenous knowledge. However, indigenous knowledge is a pivotal aspect of indigenous peoples' rights which permeates all others, the safeguarding of which provides the best guarantee for indigenous accommodation in the global constitutive process.

The concurrent development of the CBD program of work in a number of relevant areas, including indigenous knowledge, articles 8(j), 10(c) and, of course, the elaboration of the Bonn Guidelines within the incubation of the UNDRIP in the UN process, resulted in some harmony in the deployment of key words and common concepts that are now constitutive of the emerging normative elements in the uptake of indigenous knowledge in international environmental law. Those include the principles of free prior informed consent, capacity building, technology transfer, indigenous rights to their natural resources, access and benefit sharing, provision of financial support mechanisms, support and preservation of traditional knowledge, and innovations relevant to sustainable development. Though still evolving, these features are now the driving norms in the ongoing efforts by states via various multi- and cross-sectoral regime initiatives to implement their pre- and post-Rio+10

61. *Id.*, Article 13(1) and (2).

62. *Id.*, Articles 18, 19 and 32(2).

63. *Id.*, Article 25.

64. *Id.*, Article 31.

65. *Id.*, Article 45.

commitments under the framework of integrated management and sustainable development approaches to coastal areas and the marine environment.

THE CONTEXT OF MARINE GENETIC RESOURCES AND MARINE SCIENTIFIC RESEARCH⁶⁶

Recently, scientific and general explorative interests in the resources of the deep oceans have made marine genetic resources (MGRs) new targets of bioprospecting. This development is also coming at a time when concerns about the endangered nature of the marine environment is a cause for concerted and unfolding policy responses from diverse but sometimes overlapping regime frameworks. The increased attention that MGRs now draw signifies a shift in plant and animal biodiversity that had remained the main focus of bioprospecting, concerning which indigenous knowledge is amply implicated.⁶⁷ In contrast, the role or extent to which indigenous knowledge is implicated in the MGRs and even MSR arenas remains cloudy. Beyond indigenous knowledge, however, bioprospecting in these contexts raises the recurring issues of access, fairness, and equity in the management of global environmental resources whereof the emerging norms of access and benefit sharing are quite relevant, both in regard to the accommodation of indigenous and local communities and also of developing countries who do not have access to new oceanographic technologies or the financial wherewithal to embark on MSR. In addition, the governance of MGRs is a subject of jurisdictional tension, especially between the CBD and the LOSC.

The significance of MGRs is widespread. Already, MGRs and MSR are the basis for credible innovations in a range of areas spanning insights in pharmaceutical, optical, dental, cosmetic, bioremediation and environmental management, chemical, and bio-adaptive fields.⁶⁸ The wealth of knowledge hidden within the complex interaction of life forms within equally complex marine environments is now a matter of intense curiosity for scientists involved in MSR as they explore the real live applications of MGR derivatives. So far, extremely hot hydrothermal vents and very cold Arctic and Antarctic regions of the deep seabed are significant sites of interest for MGRs/MSR.⁶⁹ These are characteristically sites of volatile, tectonic, and overall

66. In this article, for convenience, Marine Scientific Research (MSR) is considered a synonym of Marine Genetic Research (MGR). Despite the paucity of definition of MSR in the LOSC, it is conceptually broader in scope than MGR.

67. On the increasing importance of MGRs for biotechnology, see generally L. Ridgeway, "Marine genetic resources: Outcomes of the United Nations Informal Consultative Process," *International Journal of Marine and Coastal Law* 24 (2009), 309; also Genetic Resources & Access and Benefit Sharing, n. 22 above; K.E. Zewers, "Bright future for marine genetic resources, bleak future for settlement of law of the sea consultative process on marine genetic resources," *Loyola University Chicago International Law Review* 5 (2007): 151–176.

68. See Ridgeway and Zewers, *id.*

69. Ridgeway, n. 67 above, pp. 314–315; generally Zewers, n. 67 above, p. 155.

dynamic actions in which “MGRs have developed specific protectionist features to shield themselves from their harsh surroundings.”⁷⁰ Scientists believe that the dynamics of bio-adaptations within these environments, as gleaned from marine genetic materials, have the potential to transform the drugs that tackle the diseases within the most extreme fringe of human afflictions and to push the frontiers of innovation to unprecedented levels.

The conduct of MSR is quite expensive. It is not a venture that even many developed countries could afford, let alone their developing counterparts. By some accounts, a single venture or episode of oceanographic excavation is estimated at \$1 billion.⁷¹ Not surprisingly, developed countries have had a monopoly of not only the excavation technologies but also the MGRs harvested in the excavation expeditions conducted in areas beyond national jurisdictions (ABNJ). Given the expensive, albeit uncertain nature of MSR, major research states of the developed world favour an approach premised on the freedom of the high seas for which they can access or freely scramble for MGRs on a first-come, first-served basis. That way, they could bear their costs and exclusively optimize any benefits arising from the MSR expeditions. According to this reasoning, to the extent that MSR is within the regulatory purview of the LOSC, marine bioprospecting is analogous to the right to fish on the high seas. Consequently, akin to states’ jurisdiction to control their flagged fishing vessel in ABNJ, they ought to have the same power to control their vessels and research devices designed to explore MGRs in the high seas, and all areas beyond the exclusive economic zone, territorial seas, and international and archipelagic waters of a nation.⁷²

On the other hand, developing countries support the “location” of MGRs outside the LOSC regulatory principle of the freedom of the “high seas.” They prefer that MGRs are regulated within the special designation of “the Area,” i.e., a reference to LOSC Article 13 specifications of “all solid, liquid, and gaseous and mineral resources in the Area at or beneath the seabed.” According to Article 137 of LOSC, “the Area” or its resources are not subject to any single state’s exercise of sovereignty but are subject to common heritage of mankind (CHM), which the LOSC endorses in regard to MSR. For developing states, even though the LOSC does not specifically provide for MGRs, dealing with MGRs can be analogized to MSR and as such, subject to the mandate of the International Seabed Authority (ISA).⁷³ Under that framework, rights to MGRs do not belong to a single state but belong to all states and are subject

70. Zewers, *id.*

71. *Id.*, p. 151.

72. LOSC, n. 10 above, Article 116; see also Zewers, n. 67 above, p. 169.

73. The ISA is an entity established pursuant to the LOSC and the 1994 Implementation Agreement of Part XI thereto which provides for a regime for the governance of the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area). Through the ISA regime, state Parties organize and control activities in the Area, particularly with a view to administering the resources of the Area under the framework of CHM. For a general overview of the ISA and its governance structure and program of work, see <<http://www.isa.org/jm/en/about>>.

to equitable access and benefit sharing.⁷⁴ Given the respective merits of each of these competing positions, the development of an equitable framework for the governance of MGRs and MSR remains a contentious subject in need of urgent resolution, especially as life sciences and biotechnology are increasingly focused on the phenomenal mysteries of the high seas and deep oceans.

THE CBD AND LOSC: OF JURISDICTIONAL DICHOTOMY AND OVERLAP

The jurisdictional dichotomy between the CBD and the LOSC is nuanced. Pursuant to Article 4 of the CBD, in regard to components of biodiversity, the Convention is limited to areas within the national jurisdiction of member states. However, in relation to processes and activities, irrespective of whether their effects occur within or outside the areas of national jurisdiction or control of a contracting party, the Convention still applies.⁷⁵ Without equivocation, the primary jurisdictional outlook of the LOSC is “the Area” and ABNJ. Under this nuanced jurisdictional relationship between the CBD and the LOSC, recent efforts towards integrated and ecosystem-based governance of oceans and coastal law as well as MGRs tap into multi-sectoral and cross-jurisdictional sensitivities of the implicated regimes. As such, it is practically impossible to maintain a clear jurisdictional demarcation in terms of scope, effect, and ramifications of an integrated ecosystem-based approach to environmental governance,⁷⁶ even in the coastal and ocean law contexts.⁷⁷

Building upon the 1995 Jakarta Mandate on the same subject,⁷⁸ the CBD’s elaborate program of work on marine and coastal biodiversity was adopted at

74. Zewers, n. 67 above, p. 171.

75. This approach is consistent with the spirit and letter of the Rio Declaration (e.g., Principle 7) which are strongly supportive of international cooperation and global partnership toward the conservation, protection and restoration of the health and integrity of the Earth’s ecosystem. Rio Declaration, n. 5 above.

76. The CBD 2004 Guidelines on the Ecosystem Approach is the source of conceptual insight on that strategy and serve as the foundation for its adaptation across institutional and regime boundaries under the integrated framework. See CBD Guidelines on Ecosystem Approach, available online: <<http://www.cbd.int/doc/publications/ea-text-en.pdf>>. According to the CBD, the ecosystem approach recognizes that “humans, with their cultural diversity, are an integral component of many ecosystems ... [it] is essential in guiding action under the various programmes of work of the Convention [which] is the first and only international treaty to take a holistic, ecosystem-based approach to biodiversity conservation and sustainable use.” *Id.* at 1–2.

77. See generally E.M. De Santo, “Implications of the tenth Conference of Parties to the UN Convention on Biological Diversity for coastal management and marine protected areas,” *Ocean Yearbook* 26 (2012): 249–263.

78. The CBD has no specific or direct article on marine and coastal biodiversity. But the 1995 COP broached the subject via Decision II/10 which later transitioned into the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity, a policy instrument containing basic principles and thematic areas of concentration designed for implementation through a multi-year programme of work pursuant to

the 7th Conference of the Parties (COP) in 2004. The program implementation has continued to feature within the COP radar since, and was the subject of review by the 10th COP in 2010.⁷⁹ In his outline of the program, the CBD executive secretary avers:

The program of work defines key operational objectives and priority activities within five main programme elements, including: implementation of *integrated marine and coastal area management; marine and coastal protected areas; mariculture; and invasive alien species*. It also provides a general element to encompass the coordinating role of the Secretariat, the collaboration of linkages required, and the effective use of experts, as well as an element on enabling activities.⁸⁰

A highlight of the progressive trend of the CBD program of work on marine and coastal biodiversity includes the global institutionalization of integrated marine and coastal area management (IMCAM) initiatives that embrace a holistic ecosystem-based approach in diverse contexts including sustainable fishing.⁸¹ Other areas include the establishment, albeit slow-paced, of marine and coastal protected areas (MCPAs), sustainable aquaculture practices aimed at mitigating the negative environmental and ecosystem impact of mariculture, adoption of scientific criteria for identifying and protecting ecologically and biologically significant areas both in open ocean waters and deep-sea habitats, promotion of biogeographic classification and other taxonomic clarification systems for deep and open ocean areas, and renewed interest in checking the impact of destructive, illegal, unreported, and unsustainable fishing practices on marine biodiversity and other sensitive habitats. Finally, courtesy of the 10th COP in Nagoya, renewed focus on the entrenchment of an ecosystem approach to marine aquatic resources and mitigation of pressures on sensitive marine ecosystems, including coral reefs and other sensitive marine environments vulnerable to the vagaries of climate change, now constitute a broader strategic plan on biodiversity within the UN framework pursuant to the *Strategic Plan for Biological Diversity* and *Aichi Biodiversity Targets*.⁸²

Decisions IV/5 of the COP, available online: <<http://www.cbd.int/decision/cop/?id=7128>> and VII/5, available online: <<http://www.cbd.int/decision/cop/?id=7742>>.

79. For a review of the 10th COP decisions relevant to marine and coastal areas, especially on the establishment of coastal management and marine protected areas, see De Santo, n. 77 above.

80. See A. Djoghlaif, "The State of Implementation of the Programme of Work on Marine and Coastal Biodiversity under the Convention on Biological Diversity from the Perspective of the Convention Secretariat," *Ocean Yearbook* 26 (2012), p. 232.

81. See FAO, "The Ecosystem Approach to Fisheries Management," available online: <<http://www.fao.org/fishery/topic/13261/en>>; see also Djoghlaif, n. 80 above, pp. 235–236.

82. Contained in Decision X/2 Annex of the 10th COP, the Aichi Biodiversity Targets is a decade long (2011–2020) framework of action by states and stakeholders to save biodiversity and to advance its benefits for society. In addition to the Nagoya Protocol, the Aichi Biodiversity Targets are one of the major highlights of the 10th COP which was convened in

The CBD program of work on marine and coastal biodiversity is an integral aspect of the unfolding governance regime on MGRs within the broader initiative of the United Nations General Assembly (UNGA) on oceans affairs and law of the sea.⁸³ Pursuant to this initiative, the UNGA established the Informal Consultative Process (ICP) on Oceans and the Law of the Sea in 1999. The ICP serves as a critical source of expert knowledge on specific agenda items determined by the UNGA. Its mandate within the three-year time frame (2005–2008) features ecosystem approaches to oceans (2006), marine genetic resources (2007), and maritime safety and security (2008). The 8th ICP in 2007 was an elaborate, resourceful, multidisciplinary, and cross-sectoral deliberation on the subject of MGRs within the diversity of contemporary cross-cutting international initiatives.⁸⁴ They include, notably, the CBD (Access and Benefit Sharing initiative), the UN Ad Hoc Working Group on Marine Biodiversity Beyond National Jurisdiction,⁸⁵ the FAO's initiative on aquatic genetic resources,⁸⁶ and several other intergovernmental initiatives.⁸⁷

The ICP incorporates the “broad scope of expertise” and diversity of perspectives of its equally diverse participants. The legitimacy of most of the participants in the ICP derives from their recognition as identified major groups pursuant to Agenda 21.⁸⁸ The ICP's work on MGRs has contributed significantly in diverse respects, including mapping the complex and multi-faceted global governance regime for MGRs, identifying key aspects and features of the underlying policy debates, assisting to clarify techno-legal and general policy issues and appraising the potential importance and opportunities associated with MGRs. In addition, the ICP endorses holistic and integrated governance or regulatory approaches to MGRs.

Perhaps more important, as part of its crucial outcome, the ICP on MGRs highlights the “straddling” character of MGRs not only between areas within and

Nagoya in October 2010. The official text of the 20 Aichi Biodiversity Targets is available online: <<http://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf>>.

83. For a brief outlook on the work of the UNGA in this area, see *Oceans and Law of the Sea of the United Nations, Marine Biological Diversity Beyond Areas of National Jurisdiction*, available online: <http://www.un.org/Depts/los/biodiversityworkinggroup/webpage_legal%20and%20policy.pdf>.

84. For the official report of the 8th ICP, see Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its eighth meeting, Resolution A/RES/54/33, adopted on 18 January 2000, available online: <http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/54/33&Lang=E>.

85. See *Marine Biological Diversity Beyond Areas of National Jurisdiction*, 27 October 2011, available online: <http://www.un.org/Depts/los/biodiversityworkinggroup/marine_biodiversity.htm>.

86. FAO's Commission on Genetic Resources program of work on aquatic genetic resources, available online: <<http://www.fao.org/nr/cgrfa/cgrfa-mypow/en/>>; see also State of the World Aquatic Genetic Resources, available online: <<http://www.fao.org/docrep/meeting/022/mb092e.pdf>>.

87. For example, relevant agenda items at the OECD, WTO, WIPO, UNEP, the Intergovernmental Oceanographic Commission (IOC), Global Oceans Forum, Deep Sea Conservation Coalition, etc. Ridgeway, n. 67 above, p. 312.

88. *Id.*, p. 311 and n. 6 above.

beyond national jurisdictions, but also between artificially determined regime boundaries. As such, the ICP exposes the practical difficulty inherent in sustaining the jurisdictional mapping and micro-geographic limitations of MGRs in different regimes vis-à-vis broader oceans law and policy, conservation of marine environment, and equitable and sustainable exploration and utilization of its resources. In a counterintuitive way, this weakness now compels the holistic, ecosystem-based and integrated regime approaches to oceans law and MGRs resources governance. That approach is presently being facilitated by the UNGA. The UNGA's ongoing synergistic initiatives via the ICP and engagement with the CBD via the COP have resulted in forging a collaboration of purpose between the two principal regimes.

INDIGENOUS KNOWLEDGE, INTELLECTUAL PROPERTY AND ACCESS AND BENEFIT SHARING

The above selective overview of the developments and the state of challenges in the MGRs and MSR has some important ramifications for indigenous knowledge and intellectual property. Already, we have noted that issues of indigenous knowledge resonate less in the ocean, high seas, and marine environmental arenas than in the terrestrial or conventional national jurisdictional realms – a situation that justifies the prominence that the CBD attaches to indigenous knowledge.⁸⁹ However, that proposition is not to be stretched too far in light of the new policy trend toward a synergistic regime and integrated approaches to ocean law and marine environmental regimes. In that context, boundary-marking at both jurisdictional and geographical levels becomes too artificial and readily blurred. Consequently, part of the gaps in the new global initiatives on MGRs and MSR and the broader coastal and oceans laws development is the failure to engage or re-think the context of indigenous knowledge as opposed to leaving the same to non-interrogated assumptions.

In addition, since the primary level of implementation of the CBD program of work on marine and coastal biodiversity is at national and local levels,⁹⁰ there are diverse ways in which indigenous knowledge and interests ought to be activated and strengthened. First, for example, insight from indigenous and local peoples and their knowledge systems are not only important for best practices in regard to management of sensitive ecosystems. Second, these communities are also important

89. But that is a too simplistic assumption. It has been observed, for example, that Canada's Aboriginal peoples have a longstanding relationship with the sea due to the country's extensive coastlines and rich marine resources. This is particularly the case in regard to the coastal peoples of the British Columbia and the Inuit. Oguamanam, n. 22 above, p. 115–6. In Canada, not many would contest the claim that “the Inuit (who live in the ice 70% of the year) know the ice more than anybody,” T.P. Lauriault, Ph.D., Geomatics and Cartographic Research Centre (GCRC), Carleton University, Ottawa, pers. comm., Ottawa, 28 June 2012.

90. Djoghlaflaf, n. 80 above, p. 232.

constituencies for cross-sectoral knowledge networking, capacity building, education, training and strategic awareness-raising, and trans-epistemic information and knowledge exchange.⁹¹ The extent to which these gaps can be plugged will depend upon the degree to which indigenous knowledge is engaged in the emerging MGRs and MSR within the framework of both coastal and ocean law governance and policy.

As a third point, indigenous peoples are part of the critical global populations of coastal and maritime communities who are rendered vulnerable by the vagaries of climate change.⁹² They are within the direct and indirect scale of impact of the various sectoral policies and structural initiatives such as those on sustainable and responsible coastal fishing, the establishment of MPAs, MCPAs, the auditing of ecologically and biologically significant areas (EBSAs), etc. These proposed and ongoing structural policy changes have relevance to indigenous local communities and their knowledge systems and ways of life at multiple levels. For instance, at least in the coastal and island geographic realms, indigenous peoples' experiences, from their historic stewardship of these sensitive environments, are sources of insights for current policy initiatives. As well, these new initiatives put pressure on indigenous peoples, often requiring state acquisition of their ancestral lands and forced relocation. The cumulative distortions arising from these experiences pave the way for further economic endangerment and marginalization of indigenous peoples and knowledge. The management of these structural changes needs to be sensitive to established rights of indigenous peoples under the UNDRIP and the UN human rights framework and even the Rio Declaration.⁹³ These initiatives also require indigenous peoples to acquire new technological and adaptive skills that can only succeed through sufficient funding, training, and capacity building.

In regard to intellectual property rights, MGRs and MSR are a major source of tension between developed and developing countries, and by extension, indigenous and local communities. As mentioned earlier, the inclination of developed countries toward a freedom of high seas approach to accessing MGRs in the deep seas and the conduct of MSR is served by the inherently exclusionary character of intellectual property. MGRs, as resources, are not candidates for intellectual property. To the extent that they are pre-existing in nature, they are subject to *discovery* and hence outside the claims to intellectual property. However, through MSR, MGRs can be isolated and adapted to accomplish diverse objectives. Under the TRIPS Agreement, isolated strands of MGRs and their derivatives are candidates for patent rights.⁹⁴ MGRs and MSR are yet subjects for ideological and philosophical tension between indigenous and local communities and a majority of developing countries

91. One easy example of this is in the realm of taxonomic insights.

92. Agenda 21, n. 6 above, Chap. 17.3.

93. For example, UNDRIP, n. 21 above, Articles 8(2)(b(c)), 10, 18, 20(2), 29(1), and 32; see also Agenda 21, n. 6 above, Principle 17.

94. For standard of patentability and patentable subject matter, see TRIPS, n. 34 above, Article 27.

on the one hand, and the industrialized/developed countries, on the other, regarding the role of intellectual property and the ethics of commoditization and proprietary claims over life forms.⁹⁵ Intellectual property is easily an instrumental mechanism for the exclusive appropriation of MGRs through MSR that only a few technologically competent industrialized countries can undertake to the exclusion of their developing country counterparts.

Within the multiple regime elaborations, including under the WIPO-IGC, the UNDRIP, the Nagoya Protocol, etc., MGRs (in their diverse ecological locations, e.g., coastal, oceans, deep seabed, etc.) are not excluded from emerging jurisprudence of access and benefit sharing to genetic resources and associated indigenous knowledge forms. The degree to which indigenous knowledge is implicated in the MGRs and, by extension MSR, may depend on specific sites of interest. According to Ridgeway, “[t]he role of traditional knowledge in MGR [Marine Genetic Research] may not be the same as in a terrestrial context – it may be linked to sources/location but less linked than in the terrestrial context to knowledge of the role of MGRs (processes), or to less accessible resources in deep seas or in ABNJ.”⁹⁶ As already discussed, given the ecosystem-based and integrated framework approach to coastal and ocean governance, some of these forms of assumptions about traditional knowledge may require progressive tampering as more knowledge becomes available. Overall, the extent to which traditional knowledge is implicated in MGRs and MSR arenas may not be a matter for exact science or precise audit. And in so far as MGRs and MSR constitute key dynamics of global environmental resources and sites of epistemic interface, they are amenable to the contemporary developments and logic that justify the emerging jurisprudence on access and benefit sharing.

Already, the adaptation of insights from WIPO-IGC to the MGRs context is an increasingly credible proposition.⁹⁷ Also, even though the Nagoya Protocol is premised on the CBD and, as such, bound by the latter’s jurisdictional limitations, it not only re-echoes some of the features of the IGC deliberations, but also provides some insight in regard to dealing with both transboundary genetic resources and traditional knowledge shared by homogenous indigenous and local communities living in more than one state party through the principle of transboundary cooperation.⁹⁸

Furthermore, in its substantive and subsidiary deliberations, the ICP on Oceans and Law of the Sea in 2007, which focused on MGRs, broached the subject of intellectual property, traditional knowledge, and access and benefit sharing in the context of MGRs. For example, these issues have been characterized as the “most controversial” aspect of the ICP.⁹⁹ They were specifically reflected in paragraph 11 of

95. See generally, B. Amani and R.J. Coombe, “The human genome project: The politics of patents at the intersection of race, religion and research ethics,” *Law and Policy* 27 (2005): 152–188.

96. Ridgeway, n. 67 above, pp. 314–5, p. 317.

97. Zewers, n. 67 above, p. 171.

98. Nagoya Protocol, n. 25 above, Article 11.

99. Zewers, n. 67 above, p. 173.

the annex (titled *MGRs: Co-Chairs' Possible Elements to be Suggested to the General Assembly*) to the official report/resolution of the ICP,¹⁰⁰ as proposed for UNGA's adoption.¹⁰¹ Initial objections to that text were characteristic of the tension that the subjects of intellectual property,¹⁰² traditional knowledge, and access and benefit sharing evoke in other forums between developed and developing countries.¹⁰³ Under the 2007 ICP, those objections were resolved through informal consultations.¹⁰⁴ The agreed text of paragraph 11 suggested by the Co-chairs to the General Assembly notes that:

[T]here are several aspects of intellectual property regimes relating to marine genetic resources that need to be better considered, including in relation to disclosure of source of origin of marine genetic resources, links to traditional knowledge, impacts on the sharing of knowledge and implications for access and benefit-sharing, and note the ongoing discussions and expertise of relevant intergovernmental organizations, including the World Intellectual Property Organization and the World Trade Organization.

Similarly, in their substantive reports, the Co-chairs of the 8th ICP highlight the ever-recurring controversy over intellectual property rights, the phenomenon of biopiracy,¹⁰⁵ and traditional knowledge in the specific context of MGRs and MSR as follows:

Some delegations stressed the usefulness of databases of arrangements on access and benefit-sharing, and of prior art and traditional knowledge, in particular for enabling national patent offices to avoid issuing patents that risked

100. For text of the official report of the 8th ICP, see Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its eighth meeting, Resolution A/RES/54/33, adopted on 18 January 2000, available online: <http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/54/33&Lang=E>.

101. The draft report articulates the resolution of participating Parties in the ICP that is then presented by the Co-chairs of the ICP to the UNGA for the latter's adoption.

102. For example, Australia led the developed countries in opposition to the proposed text, while Pakistan made an opposing argument on behalf of the G77. See Statement by the Delegation of Pakistan on Behalf of the Group of 77 and China after Adoption of the Law of the Sea Resolution (A/62/L.27), 21 December 2007, Plenary of the 62nd Session of the UN General, available online: <<http://www.g77.org/statement/getstatement.php?id=071221>>.

103. WIPO Patent Agenda "aims at harmonizing the international patent system under the vision of a universal patent regime." Under that agenda, the unsolved issue of disclosure of source of origin of genetic resources and associated traditional knowledge in patent application is supported by the majority of developing and least developed countries and resisted by their developed counterparts. Oguamanam, n. 43 above, p. 68; also Arezzo, n. 26 above.

104. Zewers, n. 67 above, p. 173.

105. In para. 65, they wrote, in part, that "Some delegations expressed concern over "biopiracy", which they considered to include the illegal extraction of marine genetic resources and the associated traditional knowledge from areas within national jurisdiction and even from beyond areas of national jurisdiction."

“misappropriating traditional knowledge.” It was noted that in some cases accusations of such misappropriation had been fuelled by a handful of patents which had been contested and rescinded, and where patents had been granted because the examiner did not have information regarding the relevant traditional knowledge (see also paras. 63–65 below).^[106] In that respect, some delegations emphasized the need to ensure that indigenous people received fair treatment in relation to decisions over resources and that relevant traditional knowledge was translated into commonly understood scientific terms.

Since 1999 when the ICP was established by the UNGA, it has remained a strategic resource for knowledge on oceans and law of the sea. Some items on its agenda include maritime security and safety (9th ICP),¹⁰⁷ implementation of the outcomes and appraisal of the ICP from its inception (10th ICP),¹⁰⁸ capacity-building in ocean affairs and the law of the sea, including marine science (11th ICP),¹⁰⁹ and an appraisal of the UN Conference on Sustainable Development in terms of progress, implementation challenges and gaps (12th ICP).¹¹⁰

CONCLUSION

On the occasion of Rio+20, there is little doubt that states' balance sheets on the commitments they made pursuant to the first Rio Summit, and Rio+10 are in deficit.¹¹¹ However, a negative overall impression of international environmental law and policy in the last several decades needs to be tampered by 'a what-if scenario' reflection in which there was no Brundtland Commission's wake-up call,¹¹² and no

106. These paragraphs address biopiracy.

107. Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its ninth meeting, UN Doc. A/63/174, 25 July 2008, available online: <http://www.un.org/Depts/los/reference_files/new_developments_and_recent_adds.htm>.

108. Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its tenth meeting, UN Doc. A/64/131, 13 July 2009, available online: <<http://www.neafc.org/system/files/UNICPOLOS%2010web.pdf>>.

109. Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its eleventh meeting, UN Doc A/65/164, 23 July 2010, available online: <<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/462/32/PDF/N1046232.pdf?OpenElement>>.

110. Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its twelfth meeting, UN Doc A/66/186, 25 July 2011, available online: <<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/431/39/PDF/N1143139.pdf?OpenElement>>.

111. *The Future We Want*, n. 3 above, paras. 19–21.

112. Also known as World Commission on Environment and Development (WCED), which was an offshoot of the 1972 United Nations Stockholm Conference on the Human Environment and the 1980 World Conservation Strategy of the International Union for the

responsive Rio package of international environmental instruments (CBD, UNFCCC, Rio Declaration, Agenda 21, etc.) and no LOSC, to mention a few. Yet, another 'what-if scenario' is one whereof Parties stuck to their commitments in these paradigmatic international initiatives. Even then, it is doubtful whether that would have resulted in the desired sustainable environment dreamland. As the global environmental dynamics and state of our environmental knowledge continue to respectively unfold and advance, they challenge not only our legal systems but also our overall institutional mechanisms. So far, there is an evident disconnect between statements of policies and targets on the one hand, and political will and legal framework on the other. Like most other things, global environmental management is a work-in-progress. As is evident in Rio+20, we have attained a governance and regulatory glut and have yet to translate all of the commitments made in the past four decades.

Since 1992, the CBD has helped, in no small measure, in integrating indigenous or Aboriginal knowledge into the corpus of international environmental law. In addition to the CBD, other legal strides in indigenous ecological knowledge have tended to focus on plant and animal genetic resources and the terrestrial realm. Despite consistently politically correct references to indigenous peoples and their knowledge forms in most environmental policy documents pursuant to the Rio Declaration, in the realm of coastal and ocean law and the governance of MGRs and MSR, the ball seems to have been dropped on indigenous knowledge under questionable but unwritten and non-interrogated assumptions over the extent to which indigenous knowledge is implicated in the ABNJ and overall marine environment.¹¹³

As the principles of integrated, multidisciplinary, and cross-sectoral ecosystem-based approach to environmental management take hold, conventional assumptions that privilege specific knowledge systems over others are no longer sustainable. In the specific context of MGRs, the unfeasibility of jurisdictional and ecological boundaries compels the need to fully re-engage indigenous knowledge beyond the presently low profile. Not only are indigenous peoples being pressured to make major sacrifices in light of demands for structural adjustments and initiatives for

Conservation of Nature, it was a pivotal initiative for creating awareness and a global strategy to negotiate the relationship between environment and development in the framework of sustainable development. The WCED is one of the foundational pillars of international environmental law and policy.

113. For example, in the latest report on the work of its 12th meeting the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea to the General Assembly centred on "contributing to the assessment, in the context of the United Nations Conference on Sustainable Development, of the progress to date and remaining gaps in the implementation of the outcomes of the major summits on sustainable development and addressing new and emergent challenges," there is no single mention of indigenous knowledge in this self-descriptive document whose significance is self-evident. See Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its twelfth meeting, UN Doc A/66/186, 25 July 2011, available online: <<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/431/39/PDF/N1143139.pdf?OpenElement>>.

coastal, oceans and marine environmental management and green economy, how those adjustments affect their lifestyles and the sustainability of their knowledge systems needs to engage law and policy in a manner that takes into account legal developments on indigenous peoples' knowledge from the human rights framework. As well, it calls for greater and renewed sensitivity to the principle of common but differentiated responsibility.¹¹⁴

The recent and ongoing backlash over "green grabbing," or "land grabbing,"¹¹⁵ in which the natural resources of vulnerable members of society are acquired by powerful global actors ostensibly for the 'altruism' of promoting the green economy, presents an opportunity for critical reflection to eschew its replication in the context of coastal, ocean and marine environmental resource governance. A global comprehensive governance regime for oceans and their resources pursuant to a multi-disciplinary, cross-sectoral, and integrated ecosystem-based approach needs to address the gap identified in the green-grabbing phenomenon with a view to an outcome that would render indigenous peoples and other stakeholders less vulnerable. Such a governance regime must address and incorporate the issue of access and benefit sharing and the subject of intellectual property within the contours of equity, taking cue from progress made under the CBD and other regimes. Unfortunately, Rio+20 was less forceful on trans-regime and integrated approaches to oceans and marine resource governance.¹¹⁶ Even less cheerily, Rio+20 galvanized the support of 190 countries on the so-called global green economy, which potentially opens the floodgate for active private sector participation thereto within the guise of poverty eradication, while undermining the urgency to decisively tackle the issue of access and benefit sharing and a policy framework for the conduct of MSR and dealings with genetic resources on ABNJ.

A comprehensive oceans governance regime needs to be premised on the evolutionary state of knowledge of the seas, oceans, and the marine environment.

114. Rio Declaration, n. 5 above, Principle 7.

115. This is a reference to the acquisition or outright appropriation of land and resources of mainly peasant and indigenous or local communities in the developing and least developed countries by external interests ostensibly for environmental objectives. For diverse perspectives on this phenomenon, see J. Fairhead et al., "Special issue: Green grabbing: A new appropriation of nature?," *Journal of Peasant Studies* 39, Issue 3-4, (2012).

116. *The Future We Want*, n. 3 above, see para. 158's weak reference to effective application of ecosystem approach in the context of oceans and seas. Under the section titled "Oceans and Seas", which comprises a total of 21 paragraphs, there is only one reference to the CBD (in para. 177, the last paragraph) which is a reference to Decision X/2 of the 10th COP's 2020 target for the conservation of "10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services" through a framework of "equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures." This section of the Rio+20 outcome statement is silent on the jurisdictional implications of ecosystem approach as it relates to CBD and LOSC, and appears to create the impression that CBD has little if any role at all in the context of oceans and seas. It is a presumption that further entrenches the marginalization of indigenous knowledge in the marine environmental arena.

Particularly, it bears recognizing that given recent strides in MSR, there are no clear-cut geographical demarcations between genetic resource haves and have-nots. For example, regions hitherto perceived to be genetic resource have-nots are domains of extreme hot hydrothermal vents and extreme cold Arctic, Subarctic, and Antarctic sites that are known treasure troves of MGRs with monumental promise for MSR and biotechnology. The breaking down of these pre-existing or conventional fixations will help to bridge the gulf between developed and developing countries over the manner of exploitation of MGRs and conduct of MSR in general and the distribution of the ensuing benefits.

Finally, MSR presents a significant opportunity for an objective appraisal of bioprospecting, the role of intellectual property and private and public actors in innovation for sustainable development. In the context of biological diversity within land-based ecological and jurisdictional boundaries, bioprospecting has been conflated with biopiracy and the appropriation of indigenous knowledge. Such framing drowns the imperative for a public interest policy approach to bioprospecting for sustainable development in which private and public sectors could have mutually re-enforcing roles. Within this matrix, the coasts, oceans, high seas, and overall marine environment are readily sites of noncontroversial public interest MSR to, among other things, address globally shared threats of climate change and advance the three pillars of sustainable development in the public interest.¹¹⁷ Continued interagency coordination on oceans, coasts and broader marine environmental issues within the principle of the ecosystem approach in the post-Rio+20 era will reveal that commitments at multiple conferences and in environmental instruments to recognize, strengthen, and reposition indigenous peoples and their knowledge systems as major stakeholders in sustainable development are just as relevant in the coastal and oceans arena as they are in other contexts. That realization evokes the urgency to progressively rethink and re-engage, as opposed to discount, indigenous issues and knowledge in the marine environmental context as knowledge and insights in that milieu continue to evolve.

117. Namely, environmental, economic and socio-political and human aspects of sustainable development.