REGIONAL FOCUS & CONTROVERSIES

Registration of BBNJ Research Activities: A Move towards Transparency in Research Governance

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The Prep Com recommended in July that the UNGA initiate a negotiating conference on areas beyond national jurisdiction. It is widely expected to make such a decision. Then, the long haul negotiation will begin. The 1982 UN Convention on the Law of the Sea does not regulate marine genetic resources in areas beyond the national jurisdiction of States (BBNJ). Part XIII of the Convention could accommodate BBNJ research, but not its governance. The triangulation of three factors - the interim absence of an international framework for governance of BBNJ research, an indirect reference to this issue in the on-going BBNJ deliberations on access and benefit sharing and an interim laissez-faire attitude in BBNJ exploration and exploitation - leads to a need for transparency in governance of BBNJ research activities. To address this lacuna, a United Nations Register on BBNJ Research Activities is recommended, encouraging scientists from all regions including Asia to engage in BBNJ research.

Keywords
Governance, Marine Scientific Research of Bbnj, UNCLOS, Deep Seabed Area, Registration Convention

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1. Introduction

The UN may finalize a legal regime for the sustainable use of marine biodiversity in areas beyond national jurisdiction ("BBNJ"), through an Implementing Agreement to the 1982 UN Convention on the Law of the Sea ("UNCLOS").[1] However, there seems to be no discussion on registering a marine scientific research ("MSR") activity on BBNJ in the above instrument, for the purposes of *prima facie* research transparency. The conduct of MSR on BBNJ encompasses the high seas and the Area (the sea bed, ocean floor and its sub-soil beyond the limits of national jurisdiction) or perhaps in the airspace above the high seas. This paper argues that the governance of BBNJ research activities, taking cognizance but independent of the access and benefit sharing debates at the UN, should be registered in a new instrument called the United Nations Register on BBNJ Research Activities, (hereinafter UN Register), following the precedent set by the 1975 Convention on the Registration of Objects Launched into Outer Space.[2] The triangulation of three factors - the interim absence of an international framework for BBNJ,[3] the omission in deliberating on registration of BBNJ research activities in the ongoing UN debates, and an interim *laissez-faire* attitude in the exploration and exploitation of these resources - has led to a need for transparency in governance of BBNJ research activities on the high seas, deemed a global public good.[4] Such a UN Register adopted under a UNGA Resolution, will facilitate transparency in governance of BBNJ research for all actors.

Following the UNCLOS, the International Sea-bed Authority ("ISBA") has mandate over the functions in the Area. Article 143(1) of the UNCLOS provides that

1 Adopted on Dec. 10, 1982; entered into force on Nov. 16, 1994, 1833 U.N.T.S. 3, *available at* http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (last visited on Apr. 24, 2018).

2 Adopted on Nov. 12, 1974; entered into force on Sept. 15, 1976, G.A. Res. 3235 (XXIX), 1023 U.N.T.S. 15, *available at* http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introregistration-convention.html (last visited on Apr. 2, 2018).

3 IISD, *Summary Highlights of the First Session of the Preparatory Committee on Marine Biodiversity of Areas Beyond National Jurisdiction*, 25:106 Earth Negotiations Bull. (2016), *available at* http://enb.iisd.org/vol25/enb25106e.html. *See also* Preparatory Committee established by General Assembly Resolution 69/292: Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, Chair's overview of the first session of the Preparatory Committee, *available at* http://www.un.org/depts/los/biodiversity/prepcom_files/PrepCom_1_Chair's_Overview.pdf (all last visited on Apr. 24, 2018); F. Bevis, Marine Genetic Resources, Access and Benefit Sharing : Legal and Biological Perspectives (2013); D. Petra et al., *Marine Genetic Resources in Areas beyond National Jurisdiction: Access and Benefit-Sharing*, 27 Int'l J. Marine & Coastal L. 375 (2012); L. David, *Moving the Marine Genetic Resources Debate Forward: Some Reflections*, 27 Int'l J. Marine & Coastal L. 435 (2012).

4 It is sometimes referred to as common-pool resources in economics such as fish stocks leading to the "tragedy of the commons." *See* G. Hardin, *The Tragedy of the Commons*, 162(3859) Sci. 1243-8(1968).

MSR in the Area shall be carried out exclusively for peaceful purposes and the benefit of mankind as a whole, in accordance with Part XIII. Article 142(2) points out that the Authority may carry out MSR concerning the Area and its resources and enter into contracts for that purpose. Resources during the third UN Conference on the Law of the Sea negotiations were understood to be non-living resources. The Authority is legally mandated to promote and encourage the conduct of MSR in the Area and coordinate and disseminate the results when available. Part XIII of the UNCLOS has established guidelines regarding MSR. The ongoing circle of UN debates on the BBNJ points to a lacuna in the international debate regarding a register of information on governance of MSR activities in the BBNJ in the final agreement.[5] This paper is composed of six parts including Introduction and Conclusion. Part two will discuss compatibility with the UNCLOS and public good nature. Part three will review registration of BBNJ research activities. Part four will address the proposal. Part five will show the scope of the proposed UN register on BBNJ research activities.

2. Compatibility with the UNCLOS and Public Good Nature

The conduct of marine scientific research on BBNJ, whether *via* bio-prospecting,[6] or bio-discovery,[7] may or may not result in a commercialized product, though unique genetic forms are discovered.[8] Both forms of activities require deep-sea scientific

5 U.N. Doc. A/RES/72/249 (Jan. 19, 2018), *available at* https://undocs.org/en/A/RES/72/249 (last visited on Apr. 24, 2018).

6 S. van den Hove & V. Moreau, Deep-sea Biodiversity and Ecosystems: A Scoping Report on Their Socio-economy, Management, and Governance, UNEP World Conservation Monitoring Centre 50 (2007), *available at* https://ia800500.us.archive.org/5/items/deepseabiodivers07vand/deepseabiodivers07vand.pdf. *See also* Huaiwen He, *Limitations on Patenting Inventions Based on Marine Genetic Resources of Areas beyond National Jurisdiction,* 29 Int'l J. Marine & Coastal L. 521 (2014); H. Eve, *Access and Benefit Sharing of Marine Genetic Resources from Areas beyond National Jurisdiction: Intellectual Property - Friend, Not Foe*, 14 Chi. J. Int'l L. 493 (2013-14), *available at* https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?referer=https://www.google.co.kr/&httpsredir=1&article=1390&context=cjil. For negative views on bio-prospecting, *see* L. Slobodian et al., *Bioprospecting in the Global Commons: Legal Issues Brief*, UNEP (2010), *available at* http://docplayer.net/23955205-Bioprospecting-in-the-global-commons-legal-issues-brief.html.(all last visited on Apr. 24, 2018).

7 E. Evans-Illidge, *Sea of miracles: industrial uses for ocean biodiversity*, Conversation, June 10, 2013, *available at* http://theconversation.com/sea-of-miracles-industrial-uses-for-ocean-biodiversity-13172 (last visited on Apr. 24, 2018). The value of undiscovered anti-cancer drugs from marine origin was estimated to be USD 563 billion - 5.69 trillion in 2010. *See* E. López-Legentil, & P. Schuhmann, *The Pharmaceutical Value of Marine Biodiversity for Anti-Cancer Drug Discovery*, 70 Ecological Econ. 445-51 (2010).

8 For details on discovery of unique properties, successful development of pharmaceutical products and deep-sea research

research and access.[9] The ultimate benefit is for the global public good.[10] Some national scientific research institutions involved in marine scientific research on BBNJ[11] are:

- Japan Agency for Marine Earth Science and Technology ("JAMSTEC") (formerly Japan Marine Science and Technology Centre);
- Australia's Commonwealth Scientific Industrial and Research Organization;
- Institut Français de Recherche pour l'Exploitation de la Mer ("IFREMER");
- Korean Ocean Research and Development Institute ("KORDI");
- Woods Hole Oceanographic Institute; and
- New Zealand Institute of Geological and Nuclear Sciences.[12]

A. Compatibility with the UNCLOS

The compatibility issue of the marine research activity on BBNJ under the UNCLOS is not linked to the issue of patents[13] and intellectual property rights.[14] Costa Rica, at the first session of the PrepCom commented on the elements of a draft text of an international legally binding instrument under the UNCLOS on the conservation and sustainable use of BBNJ. It recalled that patents on marine genetic resources ("MGRs") have been issued in 31 countries. Of these, 90 percent belonged to 10 technologically advanced countries and represented 10 percent of coastal areas globally.[15] Governance

programs, *see* Monterey Bay National Marine Sanctuary: Davidson Seamount Management Zone Threats Assessment (hereafter Monterey Bay Report), at 12 (June 2012), *available at* https://nmsmontereybay.blob.core.windows.net/montereybay-prod/media/research/techreports/mbnms_2012_dsmz_threats.pdf (last visited on May 1, 2018).

9 H. Harden-Davies, *Deep-sea genetic resources: New frontiers for science and stewardship in areas beyond national jurisdiction*, 137 Deep-Sea Research Part II: Topical Studies in Oceanography (2017), *available at* http://ac.els-cdn.com/S0967064516301059/1-s2.0-S0967064516301059-main.pdf?_tid=87a5279a-f993-11e6-acc0-00000aab0f26&acdnat=1487832451_d0fd10aa46715666acf92b7407193425 (last visited on Apr. 24, 2018). *See also* H. Harden-Davies, *Marine science and technology transfer: Can the Intergovernmental Oceanographic Commission advance governance of biodiversity beyond national jurisdiction?* 74 Marine Pol'y 260 (2016).

10 N. Peter, *Ocean Bio-Prospecting*, Huffington Post, July 12, 2013, *available at* http://www.huffingtonpost.com/peter-neill/law-of-the-sea-ocean-bioprospecting_b_3575098.html (last visited on Apr. 24, 2018).

11 To know the equipment required in the conduct of scientific research, *see* The Monterey Bay Report 2012, at 14 (Figure 5).

12 D. Leary, *Bioprospecting and the Genetic Resources of Hydrothermal Vents on the High Seas: What is the Existing Legal Position, Where are we Heading and What are our Options?* 7 MqJlICEnvLaw 137 (2004), *available at* http://www.austlii.edu.au/au/journals/MqJlICEnvLaw/2004/7.html#Heading58 (last visited on Apr. 24, 2018).

13 For patents in the US in 2008, *see* K. Zewers, *Debated Heroes from the Deep Sea - Marine Genetic Resources*, WIPO Mag. (Apr. 2008), *available at* http://www.wipo.int/wipo_magazine/en/2008/02/article_0008.html (last visited on Apr. 24, 2018). *See also* He, *supra* note 6, at 521.

14 Peru views that there is a distinction between MSR and bioprospecting. *See* IISD, *supra* note 3.

15 Convened from 28 March to 8 April 2016 at UN Headquarters in New York. *See id.*

of the areas beyond national jurisdiction span the gamut of the law of the sea.[16]

Scovazzi questions the widespread opinion about the UNCLOS notion of MSR's absence of intent of economic gain and agrees that Article 243 of the UNCLOS refers to the notion of MSR without defining it.[17] Article 243 provides:

> States and competent international organizations shall co-operate, through the conclusion of bilateral and multilateral agreements, to create favourable conditions for the conduct of MSR in the marine environment and to integrate the efforts of scientists in studying the essence of phenomena and processes occurring in the marine environment and the interrelations between them.

The learned author queries the compatibility of the bio-prospecting and bio-discovery processes with the rule of law in the MSR provisions of the UNCLOS, Article 246, Paragraphs (3) and (5 a). Scovazzi underscores the distinction that Article 246, which applies to the exclusive economic zone and the continental shelf, makes between two kinds of marine scientific research projects, namely those carried out "to increase scientific knowledge of the marine environment for the benefit of all mankind (para. 3), and those "of direct significance for the exploration and exploitation of natural resources, whether living or non-living" (para. 5 (a)).[18] He further argues that it is this distinction that lends credibility to the opinion that, under the UNCLOS regime, research directly related to the purpose of commercial exploitation of resources also falls under the general label of "marine scientific research.[19] Scovazzi opines that MSR in the Area, including what is called bio-prospecting, might fall under the general obligations to ensure the benefit of mankind as a whole, as required by Article 143, paragraph 1.[20]

So, the learned author would argue that when Article 143 is read with Article 246, Article 143 denies an assumption of absolute freedom to carry out bioprospecting in the Area. This in turn would mean that States active in bioprospecting in the Area would be bound to contribute to the benefit of mankind. Such an approach is also compatible with the views of, for example, the EU, Australia and Mexico. The EU referred to the "Tara Expeditions as an example of non-monetary benefits by making publicly available research on MGRs"; Australia emphasized "the need to include

16 *See Editorial Introduction*: *Advancing governance of areas beyond national jurisdiction*, 49 Marine Pol'y 81 (2014).

17 T. Scovazzi, Mining, *Protection of the Environment, Scientific Research and Bioprospecting: Some Considerations on the Role of the International Sea-Bed Authority*, 19 Int'l J. Marine & Coastal L. 402-3 (2004).

18 *Id*.

19 *Id*.

20 *Id*.

access to research opportunities, pointing to fairness and equity as the underpinnings of a benefit-sharing structure"; and Mexico addressed "the appeal of the CBD Subsidiary Body on Scientific, Technical and Technological Advice ("SBSTTA") to ensure effective dissemination of MSR related to MGRs."[21] The three cardinal principles for international cooperation by States enshrined in Article 143(3) are:

1. Participation in international programmes and encouragement of personnel of different countries and of the Authority to participate in marine scientific research;
2. Programmes developed through the Authority or any other international organization for the benefit of developing countries and technologically less well-developed States to strengthen their research capabilities, train their personnel and the ISBA personnel in research techniques and applications and encourage qualified personnel in research in the Area; and
3. Dissemination of research results and analysis when available through the ISBA or any other international channel.

The term, MSR is understood to encompass the study of the marine environment and its resources for peaceful purposes. It should be carried out for the benefit of the common heritage of mankind including equitable benefit sharing.[22]

B. Global Public Good

Article 243 of the UNCLOS states that favorable conditions should be created for MSR whereby States and competent international organizations are legally required to co-operate through the conclusion of bilateral and multilateral agreements and to integrate the efforts of scientists in studying the essence of the phenomena and processes occurring in the marine environment and the interrelations between them. A similar obligation is imposed under Article 244 which provides for the publication and dissemination of information and knowledge through appropriate channels on proposed major programs and their objectives as well as knowledge resulting from the research. For this purpose, Article 244(2) also requires States either unilaterally or

21 *Id*.

22 K. Zewers, *Marine Protected Areas on the High Seas: Some Legal and Policy Considerations*, 19 Int'l J. Marine & Coastal L. 1 (2004). *See also* A. Broggiato et al., *Fair and Equitable Sharing of Benefits from the Utilization of Marine Genetic Resources in Areas beyond National Jurisdiction: Bridging the Gaps between Science and Policy*, 49 Marine Pol'y 176 (2014); E. Molenaar, *Managing Biodiversity in Areas Beyond National Jurisdiction*, 22 Int'l J. Marine & Coastal L. 89 (2007); A. Jørem & M. Tvedt, *Bioprospecting in the High Seas: Existing Rights and Obligations in View of a New Legal Regime for Marine Areas beyond National Jurisdiction*, 29 Int'l J. Marine & Coastal L. 321 (2014).

jointly with others to promote the flow of scientific data and information and transfer of knowledge resulting from the research especially for developing countries and to strengthen their biomass of technical and scientific personnel.

Besides, the UNCLOS Preamble states that the problems of ocean space are closely interrelated and need to be considered as a whole. The Preamble also recognizes:

> the desirability of establishing through this Convention, with due regard for the sovereignty of all States, a legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment.

The Preamble underscores that achieving "these goals will contribute to the realization of a just and equitable international economic order which takes into account the interests and needs of mankind as a whole and, in particular, the special interests and needs of developing countries, whether coastal or land-locked."

The initiation and details of the research project and data collection, whether in bio-discovery or bio-prospecting, should be made known to all humankind. Sustainable BBNJ should always be encouraged to examine it from a utilitarian perspective, because it measures up as an inherently global public good conferring the greatest benefit on humankind, i.e., the greatest good of all humankind not just the greatest good of the greatest number.[23] In economics, a resource considered as a global public good is considered free for all and no one may own it or exclude others from enjoying it. The economic concept of the global public good in the context of BBNJs refers to the common societal benefit of the BBNJs that should permit all actors to engage in such research activity for any peaceful purpose. Consequently, and as a correlative to that right and freedom, the part of the various actors is obliged to inform the UN of its BBNJ activity. There is an inherent right for all States to know who are the actors out there, what equipment are being placed on the ocean floor or water column, and what sort of *in-situ* deep-sea research is being engaged in.

There does not seem to be an "international science laboratory" as yet for the BBNJs. The BBNJ actors may be scientists, companies, state sponsored or private conglomerates or anyone else. Other related questions are centered on the BBNJ cruises such as the concerned transects, dates of commencement and completion of a specific project, objectives, scope and national registration identities.

[23] J. Driver, *The History of Utilitarianism*, *in* The Stanford Encyclopedia of Philosophy (E. Zalta ed., 2014), *available at* https://plato.stanford.edu/entries/utilitarianism-history (last visited on Apr. 24, 2018).

Currently, there is no "one-stop center" that has recorded the multiple actors. Nether States, nor international organizations could carry out their BBNJ research activities. In this regard, Article 143 of the UNCLOS which provides the broad principles of MSR in the Area does not address the establishment of a register of activities, though, on a comparative note, the templates for deep-sea mining do require some information from the deep sea mining contractors through the Mining Code who intend to prospect, explore and exploit mineral resources in the Area. The templates cover questions dealing with minerals and the environment.

It would be vital to encourage all BBNJ researches for peaceful purposes to be subject to a registration procedure of the actors and their research activities so that there is transparency of information. Subsequently, States could promote international cooperation and conclude favorable international agreements for the conduct of BBNJ researches under the auspices of the UN for the commercialization of the results.

Although States would be obliged to register the national or regional entities involved in BBNJ research, it would address an important regulatory gap and three governance gaps due to a lack of global procedure and ineffective flag State jurisdiction and control over the activity.[24] From a governance perspective, a UN register of BBNJ activities will enable progress in research to be recorded and monitored by either the UN or an authority under the supervision of the UN. This falls within the scope of Article 197 of the UNCLOS which states: "States shall cooperate on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account regional features."

3. Registration of BBNJ Research Activities: Inspiration from the Registration Regime in Outer Space Law

The UN system on outer space law has two registers for the registration of the space objects: one adopted under a General Assembly Resolution 1721 B (Resolution

[24] E. Druel & K. Gjerde, *Sustaining Marine Life beyond Boundaries: Options for an Implementing Agreement for Marine Biodiversity beyond National Jurisdiction under the United Nations Convention on the Law of the Sea*, 49 Marine Pol'y 90 (2014).

Register)[25] and the other under the 1975 Convention on Registration of Objects launched into outer space (hereinafter Registration Convention).[26] Both are functional. States not parties to the Registration Convention, can register under the Resolution register. The United Nations Office for Outer Space Affairs ("UNOOSA") has summed up the history of the UN registration, the main characteristics of the Registration Convention and the current statistics on registration of space objects under the Registration and other space law conventions.

The Registration Convention had governmental support[27] and goodwill.[28] General registration requirements are also found in the law of the sea and air law.[29] The Registration Convention behooves States to maintain a national and an international (UN) register of space objects,[30] which may be filled in after the launch of the space object as seen in the historical development of the registration of space objects.

A. GA Resolution 1721 B and the Registration Convention of 1975

In 1959, a Special United Nations Committee on the Use of Outer Space for Peaceful Purposes ("UNCOPUOS") noted the importance of having a UN registry of space objects.[31] The General Assembly Resolution 1721B (XVI) established the first register in 1961 based on voluntary submission of information to the Secretary-General by the States which was disseminated under the UN document series A/AC.105/INF.[32] The

25 International Cooperation in the Peaceful Uses of Outer Space, G.A. Res. 1721 (XVI) B. (Dec. 20, 1961), *available at* http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/resolutions/res_16_1721.html (last visited on Apr. 24, 2018).

26 G.A. Res. 3235 (XXIX) (Nov. 12, 1974), 1023 U.N.T.S. 15, *available at* http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introregistration-convention.html (last visited on Apr. 24, 2018).

27 Z. Kakavand, *Progressive Development of International Space Law Opportunities and Challenges Facing the Insurance of Space Activities*, 13 Int'l Stud. J. 93 (2016).

28 P. Dempsey, *Air & Space Law Norms Governing Space Transportation,* 50 Proc. on Law of Outer Space 178 (2007); S. Hobe, *Legal Aspects of Space Tourism*, 86 Neb. L. Rev. 439 (2007-08); F. Esposito, Jr., *The Commercial Exploitation of Space*, 25 A.F.L. Rev. 159 (1985); A. Taghdiri, *Flags of Convenience and the Commercial Space Flight Industry: The Inadequacy of Current International Law to Address the Opportune Registration of Space Vehicles in Flag States,* 19 B.U. J. Sci. & Tech. L. 405 (2013); J. Trimble, *International Law of Outer Space and Its Effect on Commercial Space Activity*, 11 Pepp. L. Rev. 521 (1983-84).

29 H. Gunter & M. Reinhard, *Registration according to the Law of the Sea, Air and Space Law: A Comparative Study,* 39 German J. Air & Space L. (ZLW) 256 (1990).

30 For details on the UK practice under the space law treaties, *see* F. Lyall, *UK Space Law*, 35 Proc. on Law of Outer Space 385 (1992). For Australian state practice, *see* M. Davis, *Australia's Space Treaty Obligations*, 41 Proc. on Law of Outer Space 236 (1998); *Aviation and Space Law [legislation]*, 8 Austl. Y.B. Int'l L. 328 (1978-80); *Fears of COSMOS 954 crashing in Australia prompted Australia to adopt the Registration Convention*, 10 Aust. Y.B. Int'l L. 415 (1981-83). For conflict between international space law and domestic US space law, *see* R. Berkley, *Space Law Versus Space Utilization: The Inhibition of Private Industry in Outer Space,* 15 Wis. Int'l L. J. 421 (1996-97).

31 W. Wirin, *The Registration Convention: Ten Years After*, 28 Proc. on Law of Outer Space 203 (1985).

32 P. Lubos, *The 1976 Registration Convention*, 41 Proc. on Law of Outer Space 374 (1998). *See also The 1976*

US and the then USSR made the first two announcements in March 1962.[33] Though the registration of objects under Resolution 1721 was fairly satisfactory, several States desired a special convention on Registration.[34] Originally established as a mechanism to aid the UNCOPUOS in its discussions on the political, legal and technical issues concerning outer space, international space law has finally set up a space object registration system to identify which States bear international responsibility and liability for space objects.

Resolution 3182 (XXVIII) of December 18, 1973 requested the UNCOPUOS to consider as a matter of priority the completion of the draft text of the Registration Convention. Finally, this Resolution noted with satisfaction the completion of the Registration Convention and requested the Secretary-General to open it for signature and ratification at the earliest possible date.[35] The Registration Convention was adopted by the General Assembly by Resolution 3235 (XXIX) on November 12, 1974. It was opened for signature on January 14, 1975 and entered into force on September 15, 1975.[36] As the European Space Agency declared the acceptance of rights and obligations provided for in the Convention under Article VII.I of the Registration Convention, its satellites were duly registered.[37] Launching announcements are now made in a new series of documents – ST/SG/SER.E.[38] In 1976, there was a formal requirement to register with the UN Secretary-General:

> The international register is administered by the Office for Outer Space Affairs (OOSA) on behalf of the Secretary-General. There is full and open access to the register and OOSA has set up a searchable index which can be accessed *via* the internet.[39]

Soon after its adoption, many calls were made from several quarters to amend the

Registration Convention 47 German J. Air & Space L. (ZLW) 351 (1998).

33 *Id*. at 374.

34 *Id. See also* United Nations Office for Outer Space Affairs, *available at* http://www.unoosa.org/oosa/en/spaceobjectregister/index.html (last visited on Apr. 24, 2018).

35 *Supra note 26.*

36 14 I.L.M. 43 (1975).

37 Lubos, *supra* note 32, at 374-5. *See also* G. Lafferranderie & I. Diederiks-Verschoor, *Jurisdiction and Control of Space Objects and the Case of an International Intergovernmental Organisation (ESA),* 54 German J. Air & Space L. (ZLW) 228 (2005).

38 Lubos, *supra* note 32, at 375.

39 Hori and Hermida argued that there is room for improvement in the details of the registered information as required under the Registration Convention, so that the Convention is more attractive. *See* KayUwe Hori & J. Hermida, *Change of Ownership, Change of Registry Which Objects to Register, What Data to Be Furnished, When, and Until When?* 46 Proc. on Law of Outer Space 454 (2003).

Registration Convention. It was necessary to know the objects launched into outer space. In space law, the Registration Convention also assists in identifying objects and providing data with respect to the Liability Convention.[40]

The Registration Convention is one of five major space treaties.[41] Though the space treaties, including the Registration Convention, have some difficulties in interpreting the definition of a 'space object,'[42] the Registration Convention obliges the launching State (Article II) and the UN Secretary-General (Article III) to register the space object that has been launched into outer space.[43] Interpretational difficulties within the space law conventions including the Registration Convention did not prevent the UN from registering for space objects. These difficulties refer to security interests in space equipment,[44] salvage,[45] nature of passage,[46] management of space objects,[47] liability, harm and environmental pollution,[48] effects and harm of space

40 P. Lubos, *Review of the Status of the Outer Space Treaties: The 1976 Registration Convention,* 41 Proc. on Law of Outer Space 374 (1998). For details, *see* F. von der Dunk, *The Registration Convention: Background and Historical Context,* 46 Proc. on Law of Outer Space 450 (2003); Yun Zhao, *Revisiting the Registration Convention: Time for Revision*, 11 Austl. Int'l L. J. 106 (2004).

41 *See* Status of International Agreements relating to Activities in Outer Space as at 1 January 2016, U.N. Doc. A/AC.105/C.2/2016/CRP.3 (Apr. 4, 2016), *available at* http://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105_C2_2016_CRP03E.pdf. *See also* UN Office for Outer Space Affairs, Space Law Treaties and Principles, *available at* http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (all last visited on Apr. 24, 2018).

42 Bin Cheng, *Space Objects, Astronauts and Related Expressions*, 34 Proc. on Law of Outer Space 17 (1991); Tatsuzawa Kunihiko *The Definition of Space Object*, 34 Proc. on Law of Outer Space 357 (1991); H. Safavi, *Legal Problems of Registration Objects*, 28 Proc. on Law of Outer Space 199 (1985); M. Chatzipanagiotis, *Registration of Space Objects and Transfer of Ownership in Orbit*, 56 German J. Int'l L. (ZLW) 229 (2007); G. Gal, *Space Objects - While in Outer Space*, 37 Proc. on Law of Outer Space 84 (1994).

43 E. Finch, Jr, *Registration Treaty and Nuclear Power Resources*, 28 Proc. on Law of Outer Space 173 (1985). *See also* Wirin, *supra* note 31, at 203-7; G. Zhukov, *Registration and Jurisdiction Aspects of the International Space Station*, 42 Proc. on Law of Outer Space 75 (1999).

44 P. Larsen & J. Heilbock, *UNIDROIT Project on Security Interests: How the Project Affects Space Objects?* 64 J. Air L. & Com. 703 (1999).

45 C. Salvage-Fishman, *Space Salvage: A Proposed Treaty Amendment to the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space,* 26 Va. J. Int'l L. 965 (1985-86). *See also* M. Mejia-Kaiser, *Removal of Non-functional Space Objects without Prior Consent*, 50 Proc. on Law of Outer Space 293 (2007).

46 A. Passage-Terekhov, *Passage of space objects through foreign airspace*, 32 Proc. on Law of Outer Space 50 (1989).

47 W. Wirin, *The Sky is Falling: Managing Space Objects*, 27 Proc. on Law of Outer Space 146 (1984).

48 C. Christol, *International Liability for Damage Caused by Space Objects*, 74 Am. J. Int'l L. 346 (1980). *See also* R. Martin, *Comments: Legal Ramifications of the Uncontrolled Return of Space Objects to Earth*, 45 J. Air L. & Com. 457 (1980); A. McCloud, *Space Pollution,* 30 Proc. on Law of Outer Space 142 (1987); R. Dusek, *Lost in Space: The Legal Feasibility of Nuclear Waste Disposal in Outer Space*, 22 Wm. & Mary Envtl. L. & Pol'y Rev. 181 (1997-98); S. Marchisio, *Protecting the Space Environment*, 46 Proc. on Law of Outer Space 9 (2003).

debris,[49] limits,[50] demilitarization,[51] commercialization,[52] and risks of outer space.[53]

B. The Salient Provisions of the Registration Convention

The Registration Convention was adopted by the UN General Assembly on November 12, 1974 (Resolution 3235 (XXIX)).[54] However, as Simonetta Di Pippo pointed out, it was built upon the State practices for space object registration under Resolution 1721B (XVI) and evolution of international space law.[55] Its Preamble recognizes the common interest of all mankind in furthering the exploration and use of outer space for peaceful purposes; affirms that States shall bear international responsibility for their national activities in outer space; and refers to the State on whose registry an object launched into outer space is carried. It also addresses the provision for the national registration by launching States of space objects. Most importantly, a central register of objects launched into outer space should be established and maintained, on a mandatory basis, by the UN Secretary-General. The Preamble addresses that a mandatory system of registering objects launched into outer space would, in particular, assist in their identification and contribute to the application and development of international law governing the exploration and the use of outer space. Article I(a) defines 'launching State' as: (i) A State which launches or procures

49 V. Kopal, *Is The Present International Space Law Sufficiently Armed for the Protection of Astronauts, Functional Space Objects and Space Environment against Space Debris, or Should A Legal Regulatory System Relating to this Issue Be Established Soon?*, 46 Proc. on Law of Outer Space 288 (2003); G. Leinberg, *Orbital Space Debris*, 4 J. L. & Tech. 93 (1989); C. Williams, *Space: The Cluttered Frontier*, 60 J. Air L. & Com. 1139 (1994-95); I. Diederiks-Verschoor, *Harm Producing Events Caused by Fragments of Space objects (Debris)*, 25 Proc. on Law of Outer Space 1 (1982); N. Jasentuliyana, *Space Debris and International Law*, 26 J. Space L. 139 (1998).

50 M. Menter, *Relationship of Air Law and Space Law*, 19 Proc. on Law of Outer Space 164 (1976); K. Vladimir, *The Questions of Defining Outer Space*, 8 J. Space L. 154 (1980); F. Schwetje, *Space Law: Considerations For Space Planners*, 12 Rutgers Computer & Tech. L. J. 245 (1986-87).

51 For details on demilitarization of and confidence-building measures in outer space, *see* 18 U.N. Disarmament Y.B. 214-38 (1993); 19 U.N. Disarmament Y.B. 129-41 (1994).

52 For details on the expansion of property rights in space and role of commercial operators in space, *see* E. Reinstein, *Owning Outer Space*, 20 Nw. J. Int'l L. & Bus. 59 (1999-2000); Space Law and Remote Sensing Bibliography (Index) 33 J. Space L. 1 (2007).

53 For details on the dimensions of risks connected with space activities, *see* P. Magno & E. Scifoni, *Space Activities and Insurance*, 20 Proc. on Law of Outer Space 327 (1977).

54 Adopted on Jan. 14, 1975; entered into force on Sept. 15, 1976. 14 I.L.M. 43 (1975). As of April 1, 2016, there were 62 States Parties and 4 Signatories. Most recently, it was ratified by Kuwait in April 2014. *See* S. Di Pippo, *Registration of Space Objects with the Secretary-General* (PPT Presentation), IISL-ECSL Symposium: 40 Years of Entry into Force of the Registration Convention-Today's Practical Issues, United Nations Office for Outer Space's 55th Legal Subcommittee, Apr. 4-15, 2016, *available at* http://www.unoosa.org/documents/pdf/copuos/lsc/2016/symp-03.pdf (last visited on May 1, 2018).

55 Pippo, *id*.

the launching of a space object; (ii) A State from whose territory or facility a space object is launched. Article II refers to the registration of space objects launched into earth orbit or beyond:

1. When a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain (added: a national registry). Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry.

2. Where there are two or more launching States (added: multiple launching States) in respect of any such space object, they shall jointly determine which one of them shall register the object in accordance with paragraph 1 of this article, bearing in mind the provisions of Article VIII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object and over any personnel thereof.

3. The contents of each registry and the conditions under which it is maintained shall be determined by the State of registry concerned. [Emphasis added]

Article III, Paragraph 1 of the Registration Convention mandates the UN Secretary-General to maintain a Register in which the information furnished in accordance with Article IV shall be recorded. Article III, Paragraph 2 provides that there shall be *full and open access* to the information in this Register. [Emphasis added]. Article IV requires a "Core Set of Information" as follows:

1. Each State of registry shall furnish to the Secretary-General of the United Nations, as soon as practicable, the following information concerning each space object carried on its registry: (a) name of launching State or States; (b) an appropriate designator of the space object or its registration number; (c) date and territory or location of launch; (d) basic orbital parameters, including:(i) nodal period; (ii) inclination; (iii) apogee; (iv) perigee; (e) general function of the space object. [Emphasis added]

2. Each State of registry may, from time to time, provide the Secretary-General of the United Nations with additional information concerning a space object carried on its registry.

3. Each State of registry shall notify the Secretary-General of the United Nations, to the

> greatest extent feasible and as soon as practicable, of space objects concerning which it has previously transmitted information, and which have been but (added: the satellite is) no longer are in earth orbit. [Emphasis added]

Article V stresses the notification to the Secretary-General when a space object is "marked with the designator or registration number" prior to launch. Article VI requires States, particularly those with tracking capabilities, "to respond to the greatest extent feasible" to the requests in the identification of a space object "which has caused damage to it or to any of its natural or juridical persons, or which may be of a hazardous or deleterious nature." Article VII, Paragraph 1 provides that references to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if both the organization declares its acceptance of the rights and obligations provided for in this Convention, and a majority of the States members of the organization are States Parties to this Convention and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereinafter Outer Space Treaty). Article VII, Paragraph 2 also provides that States members of any such organization which are States Parties to this Convention shall take all appropriate steps to ensure that the organization makes a declaration in accordance with paragraph 1 of this article. Article VII allows international intergovernmental organization which conducts space activities to declare its acceptance of the rights and obligations provided for in the Convention.[56] Article VIII deals with the entry into force provisions and Article IX deals with amendments to the Convention.

Article VIII of the Outer Space Treaty provides: "A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, …" Article X of the Registration Convention reflects the importance of reviewing the Convention.[57]

[56] *Id*.

[57] Article X provides: "Ten years after the entry into force of this Convention, the question of the review of the Convention shall be included in the provisional agenda of the United Nations General Assembly in order to consider, in the light of past application of the Convention, whether it requires revision." For details, *see* M. Bourely, *Is It Necessary to Re-Negotiate the Convention on Registration?* 31 Proc. on Law of Outer Space 227 (1988); *The Institutional Framework of Space Activities in Outer Space*, 26 J. Space L. 132 (1998); M. Benkd & S. Kai-Uwe, *The 1998 European initiative in the UNCOPUOS Legal Subcommittee to improve the Registration Convention*, 41 Proc. on Law of Outer Space 58 (1998); A. dos Santos, *Brazil and the Registration Convention*, 44 Proc. on Law of Outer Space 78 (2001).

C. UNOOSA Statistics on Registration of Space Objects

UNOOSA's statistics on the registration of space objects shows:[58]

1. 74 percent of all 'space nations' have provided the Secretary-General with information on their space objects.
2. Between the two Registers, 92 percent of all functional space objects have been registered.
3. As of 1 April 2016, 6,772 functional space objects have been registered under the Registration Convention and Resolution 1721B (XVI) since 1961. Most recent registration is submission from Japan (ST/SG/SER.E/766).[59]
4. As of 1 April 2016, UNOOSA has issued 428 documents under GA resolution 1721B (XVI) registering nearly 6,000 functional and non-functional space objects. It is still used to disseminate information received from Member States who are not party to the Registration Convention.[60] Many States have provided voluntary registration information such as Algeria, Azerbaijan, Brazil, Egypt, Israel, Italy, Luxembourg, Malaysia, Nigeria, the Philippines, Saudi Arabia, Thailand, Turkey and Venezuela. Azerbaijan submitted in 2015 (A/AC.105/INF/428 of 7 December 2015).[61]

Under the Resolution Register, the following space objects are registered:

- 89 percent of functional space objects that are presently in Earth orbit or beyond;
- 96 percent of functional space objects that were in Earth orbit;
- 87 percent of functional space objects that are/were in GSO;
- 90 percent of functional space objects that are in LEO/MEO;
- Space objects on deep space/planetary missions;
- All space objects carrying nuclear power sources;
- Crewed spacecraft;
- Space station flight elements (including modules and robotic arms); and
- With the exception of one State Party, all States Parties register space objects that perform national security missions.[62]

58 Pippo, *id*.

59 *Id.*

60 *Id.*

61 *Id.*

62 *Supra* note 25.

Other UNOOSA statistics reveal:

- Between 1957 and 2010, only a few functional space objects were not registered per year.
- Only 8 percent of functional space objects have not been registered since 1957 to present. In 2010, 120 functional space objects were launched. In 2014, the number rose to 240.
- 29 percent of the functional space objects launched in 2014 are no longer in orbit.
- Non-registration of functional space objects rose from 8 percent in 2010 to 27 percent in 2014.
- In 2010, 21 States and IGOs launched space objects. In 2014, 34 States and IGOs launched. In 2015, 220 functional space objects were launched by 22 States and 3 IGOs.
- 72 percent of functional space objects launched in 2015 remain unregistered. However, several States have informed UNOOSA that they are finalising registration submission for the majority of these objects. UNOOSA expects non-registration to drop to 7 percent after receiving submissions.
- Some new 'space nations' have indicated that they are working on registration of their space objects.[63]

When States and international intergovernmental organizations agree to abide by the Convention, they are required to establish their own national registries and provide information on their space objects to the Secretary-General for the inclusion in the UN Register. Responsibility for maintenance of the Register was delegated by the Secretary-General to UNOOSA. As required under the treaty, UNOOSA publicly disseminates the information provided as UN documents, which are available through its website and through the United Nations Official Document System. UNOOSA refers to the two separate, yet complementary, registers of objects launched into outer space maintained by the Secretary-General exist: 'Resolution Register' (A/AC.105/INF/series documents) and 'Convention Register' (ST/SG/SER.E/series documents). After its entry into force, States Parties began providing information under the Registration Convention on space objects instead of Resolution 171B (XVI).

UNOOSA also highlights the 'overlap' between the two Registers: registration under Resolution 1721B (XVI) and date of re-entry under the Registration Convention:

- Some States have re-registered all their space objects under the Registration Convention. Example: France in ST/SG/SER.E/445 of March 2004.
- In such cases, the space objects are removed from the Resolution Register and placed

63 *Id.*

in the Convention Register. A notation that the object was formerly registered in the Resolution Register is made.

- Information required under the Registration Convention is similar to that voluntarily provided by States under resolution 1721B (XVI).[64]

To date, over 92 percent of all satellites, probes, landers, manned spacecraft[65] and space station flight elements launched into Earth orbit or beyond have been registered with the Secretary-General. The main headings in the UN Registry are: International Designator, National Designator, Name of Space Object, State/Organization, Date of Launch, GSO Location, UN Registered, Registration Document, Other Documents, Status, Date of Decay or Change, Function of Space Object, Secretariat's Remarks, and External website. The Online Index found 6796 UN registered objects.[66]

4. The Proposal

The governance of BBNJ Research Activities may draw upon the lessons and implications from space law. The proposal comprises the establishment of a UN Register of BBNJ Research Activities and the Introductory Concept Note to the proposed UN Register. The authors submit that MSR *per se*, though not defined in the UNCLOS, is a self-explanatory term because it involves a pure science phase and may or may not involve an applied science phase resulting in commercialization of a product. The scientific part would comprise all phases and procedures in prospecting, exploring and exploiting the BBNJ resource.

A. UN Register of BBNJ Research Activities

There are several advantages in the establishment of a UN Register of BBNJ Research Activities. First, the establishment of a UN Register of BBNJ Research Activities will ensure transparency and give prior notification to the UN. It may be provided for under Articles 243 and 244 of the UNCLOS or following the precedent set by the Registration Convention. Second, such a UN Register of BBNJ Research Activities will hopefully promote comity and good faith among all such sectors as States,

64 *Id*.

65 D. Hamilton, *The Impact of Manned Space Stations on the Law of Outer Space*, 21 San Diego L. Rev. 985 (1983-84).

66 UNOOSA, Online Index of Objects Launched into Outer Space, *available at* http://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id (last visited on Apr. 24, 2018).

regions and institutions. It is unknown if BBNJ objects may or may not be stationed permanently on the high seas unlike space objects.

Third, such a UN Register will address BBNJ research activities in the Area. Unlike the law of outer space which has to deal with uncertainties over air space and outer space boundary delimitations, the UNCLOS applies to an areas beyond national jurisdiction after the 200 nautical miles EEZ and continental shelf.[67]

Fourth, where a State or its agent or its national/s or an international, regional or national collaboration of entities prospect for explore/s and or exploit/s BBNJ resources, those marine research actions could be considered as "BBNJ research activities" by these actors. Examples of BBNJ research actions might include the emplacement of any object by these actors on the high seas, as well as any component part, and parts thereof which may belong to one or more actors, for collecting and transmitting information, or transporting and manufacturing processes. Marine research actions could furnish research platforms and research stations. They could accommodate materials on a BBNJ equipment or apparatus that may not be off-loaded and exist separately in BBNJs as part of the marine research activity. Dismantled equipment no longer used in MSR may also be recorded. BBNJ research equipment should cover both functional and non-functional equipment. It should extend to all items of property on board as well as debris and refuse originating from a BBNJ equipment either while stationing in a BBNJ, or when scattered anywhere on return to land. If BBNJ equipment debris accumulates in the high seas, it would require a UN policy on the matter as to whether States should 'disown' such objects by entries in the register so that they may be freely moved or removed by others. Any station and installation constructed by the above actors for BBNJ research should be considered as independent BBNJ equipment.

Fifth, arguably, a UN Register of BBNJ Research Activities will to some extent support an orderly and reasonable exploration and use of the high seas.[68] It is noteworthy that Article II of the Registration Convention also strives to identify space objects that have caused damage to other space objects in the Earth Orbit and beyond. However, the idea behind the UN Register for BBNJ Research Activities is to inform the UN of the various research activities taking place in the area of the high seas. Such a UN Register could represent an international governance structure for BBNJ research that is controlled by the UN Secretary-General.

Finally, in space law, the Register under the Registration Convention is identical

67 UNCLOS art. 86.

68 R. Muller, *The Contribution made by the Convention on Registration of Outer Space Objects toward the Codification and Promotion of Space Law*, 28 Proc. on Law of Outer Space 185 (1985).

to the 1962 UN Register of Objects Launched into Outer Space adopted under the UN General Assembly Resolution 1721B which assisted the UNCOPOUS in its outer space deliberations resulting in space object registration. The proposed UN Register on BBNJ Research Activities will cover all actors identified above. It will assist in bringing some measure of transparency into these activities at the UN level.

B. Introductory Concept Note to the UN Register for BBNJ Research Activities

The Introductory Concept Note to the proposed UN Register should address all States and entities, both inter-governmental and non-governmental (generally called actors), intending to conduct MSR on BBNJ. All actors would be required to register their BBNJ vessels and associated equipment and parts thereof (generally called BBNJ objects), in a UN Register for BBNJ Research Activities. The BBNJ research activity may be carried out on the high seas, sea-floor or airspace above the high seas. This in turn would necessitate the drawing up of a national register of research in those areas within national jurisdiction by the cruise organizers. In addition to the mandatory central UN Register on BBNJ Research Activities, it would in turn contribute to the application and development of international law governing the BBNJ.

It would also be necessary to appoint an International Designator, a Regional and a National Designator when relevant and necessary, to confer a respective registration number to that research exercise. Each research should have the relevant Registration Document to carry out that research exercise. Every research exercise before UN registration should have regional and/or national approval. It would also be of international interest to know the proposed transect of the cruise, the date of the proposed research activity/ies, and position of research including the coordinates. The dates of commencement and return of the research cruise and the main purpose or function of the research exercise should be stated. Likewise, the name and registration details of the BBNJ object should be stated. The results may or may not be published in the new instrument. The cost and source of funding and duration of the research should be made known.

A State could be referred to as a 'researching State' if conducting the BBNJ Research Activity on the high seas, sea-floor or airspace above the high seas and which registers the BBNJ object. Drawing upon the Registration Convention,[69] this may be, *mutatis mutandis*, defined as: (i) A State which conducts or procures the conduct of a BBNJ Research Activity and on whose national registry a BBNJ object is carried; (ii) Where

[69] Registration Convention art. I.

there is more than one researching State, the State of registry may be different. The term 'BBNJ object' could include component parts of a BBNJ object. In this proposal, when a BBNJ object is placed on the high seas, sea-floor or airspace above the high seas, the researching State should be mandatorily required to register the BBNJ object by means of an entry in an appropriate registry that it shall maintain. Each researching State should be required to inform the UN Secretary-General for the establishment of such a registry. Where there are two or more researching States in respect of any such BBNJ object, they should be required to jointly determine which of them shall register the object. Without prejudice, those States should be required to conclude appropriate agreements on jurisdiction to exercise control over the BBNJ object and any personnel thereof.

Other aspects of the Introductory Concept Note as envisaged by the authors are as follows. The contents of each national registry and the conditions under which it is maintained should be determined by the State of registry concerned. The UN Secretary-General should maintain this UN Register for BBNJ Research Activities. Here, the information furnished as requested below should be recorded. There should be full and open access to the information in the UN Register on BBNJ Research Activities. Each State of registry, if they are different from the Researching State, should furnish to the UN Secretary-General, as soon as practicable, the following information concerning each BBNJ object carried on its national/regional registry, based *mutatis mutandis* on the Registration Convention:[70]

(a) name of researching State or States;
(b) an appropriate designator of the BBNJ object or its registration number;
(c) date and territory or location of research;
(d) basic research parameters/coordinates of the transect of the cruise;
(e) general function of the BBNJ object; and
(f) date of return.

Each State of registry may, from time to time, provide the UN Secretary-General with additional information concerning a BBNJ research object carried on its national registry. It should be required to notify the UN Secretary-General, to the greatest extent feasible and as soon as practicable, of BBNJ research objects concerning which it has previously transmitted information, and which have been but no longer are on the high seas. References to States should be deemed to apply to any international intergovernmental organization which conducts BBNJ research activities. The main

70 *Id.* art. IV.

headings in the UN Registry could perhaps follow the model for outer space objects, *mutatis mutandis*, as follows: International Registration; National Registration; Name of MSR Object; State/Organization; Date of Launch; Location; UN Registered; Registration Document; Other Documents; Status, Date of Decay or Change; Function of BBNJ research object; Return of BBNJ research object; Secretariat's Remarks; and External website.[71]

This Introductory Note should be reviewed from time to time. By way of comparison, contractors engaged in polymetallic nodules mining in the deep sea-bed area under the UNCLOS are required to submit data as required by the ISBA templates on geological data, definition, datatype, purpose and values regarding Meta data, General Description, Geochemistry and Geotechnical parameters.[72] Meta data is further divided into Cruise and Sampling information. In Cruise information, the definition of a cruise requires the Cruise name, research vessel, leg number, geographical sector, and area sector. Sampling information focuses on latitude, longitude, date, time, water depth (m), station ID, abundance (kg/m2), remarks/comments, sample ID, sampling device, location of samples and remarks.[73] General Description focuses on the morphology, nodule sixe (cm), texture, nucleus, mineralogy. Geochemistry has no particular breakdown, but requires information on definition, data type, purpose and values of minerals. Many of geotechnical parameters are moisture content (%), porosity (%), void ratio, bulk density (g/cm3), dry density (g/cm3), specific gravity (g/cm3), tensile strength (MPa), compressive strength (MPa), coefficient strength of rocks, module residual deformation (Gpa), elastic modules (GPa), other measurements and analytical techniques.[74]

As the ISBA requirements templates are very detailed for contractors of polymanganese nodules mining and required under a multilateral convention, it is not proposed to use them here. However, where States are willing to consider a fresh set of criteria applicable to BBNJ research, those could be factored instead.

71 *Supra* note 65. *See also* Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects, U.N. Doc. A/RES/62/101, *available at* https://www.asi.it/sites/default/files/ONU.pdf (last visited on Apr. 24, 2018).

72 ISA, The Mining Code, *available at* https://www.isa.org.jm/reporting-templates#Env; Polymetallic Nodules, *available at* https://www.isa.org.jm/files/documents/EN/Contracts/Templates/Geo_PMN.xls (last visited on Apr. 24, 2018).

73 *Id.*

74 *Id*.

5. Way Forward: Scope of the Proposed UN Register on BBNJ Research Activities and Implications for Asian States

The commitments that States and intergovernmental organizations would be required to engage into are contribution of data from the national register to the UN Register on BBNJ Research Activities. However, the responsibility for its maintenance could be delegated by the Secretary-General to the UN Division for Ocean Affairs and the Law of the Sea ("UNDOALOS"). The UNDOALOS may then like UNOOSA publicly disseminate the information provided as UN documents, through its website and through the UN Official Document System. Currently, the percentage of BBNJ research objects are unknown to the UN as these have not been registered with the UN Secretary-General. As mentioned above, JAMSTEC and KORDI have engaged in MSR in coastal and deep sea areas. As leaders in this field, these scientists could perhaps encourage other scientists in the ASEAN and China to engage in fundamental and applied research projects of BBNJ in a consortium.[75] Such a move will uphold the fundamental tenets of international cooperation referred to in Articles 143(3), 242 to 244, 255 and 256 of the UNCLOS. The UN Register will record the international consortium as led either by Japan or Korea, while the national registers will refer to the national engagement at the international level. Currently, it is impossible for developing coastal States to carry out BBNJ research single-handedly. With leadership and collaboration of Korea and Japan, the future is promising.

6. Conclusion

The conduct of MSR activities in areas beyond national jurisdiction have so far been carried out in the absence of a UN framework except for flag State jurisdiction under the UNCLOS and related conventions.[76] It is important to establish the proposed

75 *See*, *e.g.*, JAMSTEC Research in BBNJ activities, *available at* http://www.jamstec.go.jp/e/search/?q=Biodiversity%20in%20areas%20beyond%20national%20jurisdiction; KORDI, *available at* https://www.cbd.int/kb/Results?page=1&OrderBy=Date&SortDirection=Descending&Subject=MAR (all last visited on Apr. 24, 2018).

76 *See* Access and Benefit Sharing in relation to Marine Genetic Resources from Areas beyond National Jurisdiction: A Possible Way Forward Study in Preparation of the Informal Workshop on Conservation of Biodiversity beyond National Jurisdiction (Dec. 2011), *available at* https://www.bfn.de/fileadmin/MDB/documents/service/Skript_301.pdf; H. Morioka, *Access to Marine Genetic Resources and Benefit-sharing from Their Academic Use*, Report of MGR Workshop in Japan (Nov. 26, 2015), at 46-9, *available at* http://nig-chizai.sakura.ne.jp/abs_tft/wp-content/

UN Register on BBNJ Research Activities so that all States and actors are covered, regardless of the forthcoming Implementation Agreement. Such a move reflects the national research integrity. Today, as there is no vehicle for informing the UN of either a BBNJ research activity, or object or statement of a mission purpose, all deemed a global public good for the betterment of humankind. Having a better appreciation of the actors, the various transects and activities could encourage potential future collaboration between States and other actors including academics in this area. Such a move will enable the UN Secretary-General to submit an annual report on the BBNJ marine research developments in order to pave the way for transparency in BBNJ marine research governance of the high seas. In time to come, the proposed UN Register on BBNJ Research Activities may indirectly assist in other purposes such as the detection of terrorism at sea. Alongside the adoption of a UN Register on BBNJ Research Activities,[77] States should also address the issue of patents and intellectual property rights in the context of the global public good.[78] Such transparency in ocean governance is vital and encouraging for Asian States to engage in fundamental and applied BBNJ research through the leadership of KORDI and JAMSTEC.

uploads/2016/08/Marine-genetic-resources.pdf (all last visited on Apr. 24, 2018).

77 *See Editorial Introduction* (Advancing governance of areas beyond national jurisdiction), 49 Marine Pol'y 81 (2014).

78 Bangladesh argued: "MGRs do not respect jurisdictional boundaries, and the ILBI should encourage benefit-sharing throughout the chain of discovery and R&D, with additional benefit-sharing from commercialization." *See* W. Erica, *Marine Genetic Resources: The Clash between Patent Law and Marine Law*, 29 Nat'l Resources & Envir. 44 (2014-15). For details, *see* B. Angelica & T. Seline, *Trips on the High Seas: Intellectual Property Rights on Marine Genetic Resources*, 37 Brook. J. Int'l L. 187 (2011-12).