

# Article

## Contracts on the Seabed

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“This mining, when it occurs, is going to be just massive in scale. It probably will have the largest footprint of any single human activity on the planet.”<sup>1</sup>

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1. Kevin Douglas Grant, *Deep-Sea Mining Could Make ‘Largest Footprint of Any Single Human Activity on the Planet’*, PRI (Dec. 19, 2013), <https://www.pri.org/stories/2013-12-19/deep-sea-mining-could-make-largest-footprint-any-single-human-activity-planet>.

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## INTRODUCTION

The ocean is, by all accounts, largely unexplored and very poorly understood. The only way to change that, according to the experts devoted to the pursuit of oceanic knowledge, is to “get down there and do it”<sup>2</sup> by exploring, charting and cataloguing the earth’s last frontier. To this end, the United States Oceanic and Atmospheric Administration is conducting research on as much of the ocean’s floor as it can—an area about the size of West Virginia each year—as quickly as it is able. West Virginia, though, is small compared with the ocean.<sup>3</sup>

Expeditions to explore and map the ocean floor share one feature: the novelty of what scientists are finding. A few examples of these unexpected finds include a “tar lily” found in the Gulf of Mexico in April 2014,<sup>4</sup> creatures that make their home exclusively at the 438°F mouth of hydrothermal vents, the “Pogo squid” that uses a narwhal-like horn to hop along the ocean floor,<sup>5</sup> a forty-foot-long bioluminescent pyrosome that looks like a giant aquatic tube,<sup>6</sup> and a wide variety of other previously unseen creatures.<sup>7</sup>

It is widely acknowledged that we know very little about the topography, geology, ecology or zoology of the oceans. What we do know, in fact, is that we are vastly ignorant about the contents and the floor of the oceans. With respect

2. Rebecca Jabson, *See The Strange Creatures NOAA Found at the Bottom of the Sea*, PBS NEWSHOUR (May 14, 2015), <http://www.pbs.org/newshour/updates/coral-forests-rare-sea-stars-inhabit-unseen-ocean-floor/>.

3. *Id.* While the entire ocean floor has been mapped to account for features that are larger than five kilometers across or larger, only 10-15% of the ocean floor has been mapped to a resolution that can detect features as small as 100 meters across, and only 0.05% of the ocean has been explored sufficiently to be able to detect objects that are the size of a shipwreck or mineral spires. This leaves the ocean floor significantly less well mapped than the surface of Mars, the Moon or Venus. See John Copley, *Just How Little Do We Know about the Ocean Floor?*, SCIENTIFIC AMERICAN (Oct. 9, 2014), <http://www.scientificamerican.com/article/just-how-little-do-we-know-about-the-ocean-floor/>; see also, Sen Nag, Oishimaya, *How Much of the Ocean Have We Explored?*, WORLDATLAS (Aug. 27, 2018), [worldatlas.com/articles/how-much-of-the-ocean-is-still-unexplored.html](http://worldatlas.com/articles/how-much-of-the-ocean-is-still-unexplored.html).

4. Lisa Stelzner, *An Unexpected Discovery of Tar Lilies in the Gulf of Mexico*, DAILY DOSE OF SCIENCE BLOG (May 6, 2014), <http://lisastelzner.weebly.com/daily-dose-of-science-blog/an-unexpected-discovery-of-tar-lilies-in-the-gulf-of-mexico>. See also, *Exploration of the Gulf of Mexico 2014 Daily Updates, Dive 12: Tar Lilies*, NOAA OCEAN EXPLORATION AND RESEARCH (Apr. 24, 2014).

5. Jabson, *supra* note 2, discussing the “tar lily,” hydrothermal vent creatures, the “pogo squid,” and other unique finds.

6. Kristy Hamilton, *Giant, Tubular Creature Caught On Camera Under The Sea*, IFLSCIENCE (Apr. 3, 2015), <http://www.iflscience.com/plants-and-animals/giant-tubular-creature-under-sea>.

7. See, e.g., MasakhaneSA, *Aliens of the Deep & Mission to Europa*, YOUTUBE (Sep. 15, 2009), <https://www.youtube.com/watch?v=1MkyPW11H4> (last visited Dec 11, 2019).

to understanding what exists at the bottom of the ocean, or how ecosystems operate there, “the area that has been ‘explored’ is arguably even less than the 0.05% mapped so far at the highest resolution by sonar,”<sup>8</sup> because seeing an area just once, by sonar, does not approximate an actual understanding of any given marine zone.<sup>9</sup>

Given the scientific community’s paucity of knowledge concerning deep-sea ecosystems, the proposed processes for extracting deep sea minerals, and the well-documented impacts of traditional mining operations, the environmental impacts of such projects will almost certainly be significant, even if unpredictable. Although many risks remain unknown and unknowable, a number of inherent dangers are evident in the proposed processes for extraction. The immediate impacts of such operations that involve scraping the seafloor and releasing sediment plumes also include potential fuel leaks, and noise and light pollution.<sup>10</sup>

Because the nuances of deep-sea ecosystems remain largely unknown, it is impossible to adequately assess the risks of deep-sea mining or to design appropriate measures to protect sea life. Without more information, many scientists and environmental advocates argue that “robust risk mitigation is not possible.”<sup>11</sup>

The debate over seabed mining is further complicated by conflicting opinions on the best course of action in the face of climate change. Although the Global North has contributed the vast majority of historic CO<sub>2</sub> emissions, it is undisputed that the Global South will bear the brunt of the changing climate’s most immediate and devastating impacts.<sup>12</sup> The situation is particularly dire for small island nations.<sup>13</sup> Absent substantial technology and funding support from developed nations, many developing nations will be left to mitigate and adapt to the harms of a changing climate without the necessary infrastructure or financial resources.<sup>14</sup> This situation exerts enormous pressure on the most vulnerable countries to develop at a rapid rate.

Opinions also diverge as to whether the seabed mining industry will

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8. Copley, *supra* note 3.

9. Even the Census of Marine Life, which describes itself as “the most comprehensive inventory of marine life ever compiled and catalogued” was the result of only 540 expeditions. This project resulted in a finding of over 6000 potential new species. *About the Census | Census of Marine Life*, CENSUS OF MARINE LIFE (2010), <http://www.coml.org/about-census>.

10. Kathryn Miller, et. al., *An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps*. 4 FRONT. MAR. SCI. 418; (2018). See also, Wil S. Hylton, *History’s Largest Mining Operation is About to Begin: It’s Underwater—and the Consequences are Unimaginable*, THE ATLANTIC (Jan./Feb. 2020).

11. Luisa Casson, et. al. *In Deep Water: The Emerging Threat of Deep Sea Mining*, GREENPEACE INTERNATIONAL 3 (2019), <https://storage.googleapis.com/planet4-international-stateless/2019/06/f223a588-in-deep-water-greenpeace-deep-sea-mining-2019.pdf>.

12. See Glenn Althor, et. al., *Global Mismatch between Greenhouse Gas Emissions and the Burden of Climate Change*, 6:20281 SCIENTIFIC REPORTS (2015).

13. See *Climate Change and Migration in the Pacific: Links, Attitudes, and Future Scenarios in Nauru, Tuvalu, and Kiribati*, UNITED NATIONS SOCIAL AND ECONOMIC COMMISSION FOR ASIA AND THE PACIFIC (2015), <https://www.unescap.org/resources/climate-change-and-migration-pacific-links-attitudes-and-future-scenarios-nauru-tuvalu-and>.

14. See Mizan Khan, et. al., *Twenty-five Years of Adaptation Finance Through a Climate Justice Lens*, CLIMATE CHANGE 1 (2019).

produce a net benefit or harm to global efforts to stop dangerous emissions.<sup>15</sup> On the one hand, many proponents of seabed mining argue that, with onshore mines quickly depleting, the seabed is believed to have large stores of the minerals needed to create the batteries for electric vehicles and solar panels necessary for a global transition to renewable energy systems.<sup>16</sup> Indeed, this is exactly how seabed mining company representatives refer to the importance of seabed mining, stating, for example, that “in the oil and gas sector, now almost all the new discoveries are at sea,” and that “minerals are likely to go the same way.”<sup>17</sup>

However, there is significant concern that, as the mining operations break up sediment, they will disrupt the ocean’s important function as a carbon sink, releasing stored carbon back into the atmosphere and canceling out any benefits the mined materials might have provided.<sup>18</sup> The Intergovernmental Panel on Climate Change reports that “ninety-two percent of the carbon on Earth that is not locked up in geological reserves (e.g., in sedimentary rocks or coal, oil and gas reservoirs) resides in the ocean.”<sup>19</sup> Additionally, the toll of climate change (e.g. increased water temperatures and salinity) to ecosystems in the Pacific, and on the human communities that depend on these ecosystems, demands serious consideration.<sup>20</sup> In this context of a generalized and well-acknowledged dearth of information, global interest in seabed mining is surging. While the existence of these mineral and rare earth deposits has been known since the 1960s, the technology to access them was so distant that mining these valuable deposits seemed impossible. This is rapidly changing, however. Ship-based surveys of the seafloor have traversed large swaths of the South Pacific<sup>21</sup> and extraction machinery is starting to roll off production floors.<sup>22</sup>

Indeed, Nautilus Minerals, the company running the world’s first licensed seafloor mining operation, announced in January 2016 that it had taken delivery of three fully operational seafloor production tools which are being tested for the commencement of mining in the immediate future.<sup>23</sup> Mining enterprises are

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15. See Nathaniel Gronewold, *Seabed-Mining Foes Press U.N. to Weigh Climate Impacts*, E&E NEWS (July 16, 2019), <https://www.scientificamerican.com/article/seabed-mining-foes-press-u-n-to-weigh-climate-impacts/>.

16. *Id.*

17. Harvey Cook, Director, Bismarck Mining Corporation (Vanuatu) Limited (Part of Neptune Minerals Group), Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference hosted by the Vanuatu National Offshore Minerals Committee, Port Vila, Vanuatu (October 7-9, 2014) (notes on file with the author).

18. Casson, *supra* note 11, at 3.

19. Nerile Abram, et. al., *The Ocean and Cryosphere in a Changing Climate: Summary for Policymakers*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, 1-10 (2019).

20. *Id.* at SPM-9.

21. Presentation of the Minerals Section of Geology, Mines, and Water Resources, Government of Vanuatu, *Photo of SOPAC Mining Survey Cruises*, Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference (October 7-9, 2014) (photo on file with the author).

22. Taylor Heyman, *Nautilus Minerals Unveils its Titanic Deep Sea Mining Machines*, MINING TECHNOLOGY (Nov. 26, 2015), <http://www.mining-technology.com/features/featurenautilus-minerals-unveils-its-titanic-deep-sea-mining-machines-4739435/> (noting that “deep sea mining pioneer Nautilus Minerals has revealed the three mighty machines it plans to use to scrape valuable deposits from the seafloor”).

23. *Deep Sea Mining Machines*, USGS, <https://www.usgs.gov/media/images/deep-sea-mining-machines> (last visited Nov. 10, 2020).

currently in hot pursuit of these potentially lucrative deposits. The first deep-sea mining project—the Solwara 1 Project in Papua New Guinea<sup>24</sup>—was slated to serve as a prototype for many to follow until the project, meeting community opposition, was terminated due to contractual and financing complications resulting in Nautilus’s bankruptcy<sup>25</sup> and termination from the Toronto Stock Exchange.<sup>26</sup> The implosion of Nautilus<sup>27</sup> was further complicated by its violation of contractual agreements with the Papua New Guinea government.<sup>28</sup> At the time Nautilus filed for bankruptcy in Canada, the Papua New Guinea government held a fifteen percent stake in the abandoned Solwara 1 project and equipment, and is now facing nearly \$24 million in debt,<sup>29</sup> further illustrating the need for comprehensive contracts that can meet the basic requirements for good seabed mining governance and thus shield governments that lack robust mining regulations from the unstable nature of the industry.

Innovations in machinery have reduced the barriers to entry for other seabed mining companies in other target locations. For example, Japanese Oil, Gas and Minerals National Corporation “has successfully deployed excavators to extract seabed soils rich in zinc, gold, copper and lead from depths of 1,600m in waters close to Okinawa within the Exclusive Economic Zone of Japan.”<sup>30</sup> DeepGreen, a Canadian company, portrays itself as targeting “a sustainable future—with less environmental and social impact.”<sup>31</sup>

The International Seabed Authority (ISA) “establishes specific policies and approves applications for exploration and exploitation rights.”<sup>32</sup> Its activities

24. The Solwara 1 Project, operated by Nautilus Minerals, was a prototype at the exploration stage, as well. See Satya N. Nandan, *Offshore Mining: International, Exclusive Economic Zones and Territorial Waters—An International Perspective*, MINERAL LAW SERIES no. 2 (2005) at 16E-10 (stating that the first exploration license had been granted by Papua New Guinea to Nautilus). This is the project from which Solwara 1 developed.

25. The Production Support Vessel Nautilus was depending on for the Solwara 1 project was nearly 75% complete when a financier failed to make its 3<sup>rd</sup> payment on the construction of the vessel in late 2018. See *Status of Equipment*, NAUTILUS MINERALS, <http://www.nautilusminerals.com/irm/content/status-of-the-equipment.aspx?RID=424>. This resulted in slow unraveling for the Nautilus project, and for Nautilus itself. See Ben Doherty, *Collapse of PNG Deep-Sea Mining Venture Sparks Call for Moratorium*, THE GUARDIAN (Sept. 15, 2019), <https://www.theguardian.com/world/2019/sep/16/collapse-of-png-deep-sea-mining-venture-sparks-calls-for-moratorium>. See also *In the Matter of the Companies’ Creditors Arrangement Act* [2019] B.C.S.C. No. S191827 (ordering Nautilus into bankruptcy), [https://www.pwc.com/ca/en/car/nautilus-minerals/assets/nautilus-minerals-057\\_081319-a.pdf](https://www.pwc.com/ca/en/car/nautilus-minerals/assets/nautilus-minerals-057_081319-a.pdf); *Report on Nautilus Minerals*, PWC (Nov. 21, 2019) (stating that PWC has “proceeded to file the relevant documents to assign Nautilus Minerals Inc. into bankruptcy”).

26. *Nautilus Delisted from Toronto Exchange*, PAPUA NEW GUINEA POST-COURIER (Apr. 2, 2019), <https://postcourier.com.pg/nautilus-delisted-toronto-exchange/>.

27. Amanda Stutt, *Nautilus Minerals Officially Sinks, Shares Still Trading*, MINING.COM (Nov. 26, 2019), <https://www.mining.com/nautilus-minerals-officially-sinks-shares-still-trading/#:~:text=Nautilus%20Minerals%2C%20one%20of%20the,Canadian%20Court%20in%20February%202019> and David Shukman, *Agreement Reached on Deep Sea Mining*, BBC (April 25, 2014) <http://www.deepseaminingoutofdepth.org/3366/> (describing the agreement between Nautilus and Papua New Guinea).

28. *Id.*

29. *Id.*

30. Casson, *supra* note 11, at 6.

31. *About Us*, DEEPGREEN, <https://deep.green/company/>.

32. *The International Seabed Authority*, INTERNATIONAL SEABED AUTHORITY, <https://www.isa.org.jm/documents/authority-brochure>. The ISA is composed of 168 member states from

govern the seabed that lies beyond any zone of national jurisdiction,<sup>33</sup> which is nearly 50 percent of the Earth. The ISA has been preparing for its role as a seabed license-grantor since it was established by the 1982 United Nations Convention on the Law of the Sea<sup>34</sup> and has been increasingly active since the Law of the Sea Convention was enacted in 1994.<sup>35</sup> The ISA's main activities include creating regulations for each of the types of currently known mineral deposits on the ocean floor,<sup>36</sup> including creating a process of license applications and approvals.<sup>37</sup> Among the important functions of the ISA is approving "15-year plans of work in the form of contracts, in which governmental and private entities spell out the [exploration and exploitation] activities they intend to conduct in precisely defined geographic areas assigned to them."<sup>38</sup> The ISA is actively receiving petitions for, and issuing exploration licenses to, state-owned and private companies (such as UK Seabed Resources Ltd, a Lockheed Martin Subsidiary)<sup>39</sup> from Brazil, India, Russia, Singapore, the United Kingdom, and a

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which 36 representatives are elected to serve on the Council. The Council selects experts with scientific, legal and mining expertise to serve on the Legal and Technical Commission (LTC). The LTC is charged with much of the most substantive work of the ISA, drafting regulations, reviewing applications for mining exploration and exploitation, and monitoring companies with respect to compliance with environmental rules. Much of the substantive work of the LTC, such as mineral "finds" and environmental impact assessments are kept confidential within the LTC. See Todd Woody, *Seabed Mining: the 30 People Who Could Decide the Fate of the Deep Ocean*, OCEANS DEEPLY (Sep. 6, 2017), <https://www.newsdeeply.com/oceans/articles/2017/09/06/seabed-mining-the-24-people-who-could-decide-the-fate-of-the-deep-ocean>.

33. See United Nations Convention on the Law of the Sea, art. 1, Dec. 10, 1982, 1833 U.N.T.S.397 (hereinafter "UNCLOS"); see also Nandan, *supra* note 24.

34. UNCLOS, art. 1.

35. See *Delegates Handbook 2019*, INTERNATIONAL SEABED AUTHORITY, <https://s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/2019delegat handbook.pdf>. See also Nandan, *supra* note 26, at 16E-3.

36. *The Mining Code*, INTERNATIONAL SEABED AUTHORITY, <https://www.isa.org.jm/mining-code/Regulations>.

37. *Id.* Importantly, the United States is not a signatory to UNCLOS (the treaty authorizing the creation of the ISA). Rather, the United States regulates its activities in the high seas through the Deep Seabed Hard Mineral Resources Act, 30 U.S.C. § 1401-1473 (1980), 15 CFR § 970. NOAA has issued four licenses for deep sea exploration in the Clarion-Clipperton Fracture Zone. Deep Seabed Mining: Approval of Extension and Revision of Exploration License, 67 Fed. Reg. 50,631 (Aug. 5, 2002) (Deep Seabed Mining Exploration License USA-1 extended through 2004); Deep Seabed Mining; Lapse of Exploration License, 64 Fed. Reg. 35,631 (July 1, 1999) (Deep Seabed Mining Exploration Licenses USA-2 & 3 lapsed in 1997 and 1999); Deep Seabed Mining; Issuance of Exploration License, 59 Fed. Reg. 66,942 (Dec. 28, 1994) (Deep Seabed Mining Exploration License USA-4 issued to Ocean Minerals Company). See *Review of U.S. Ocean and Coastal Law: The Evolution of Ocean Governance Over Three Decades*, U.S. COMMISSION ON OCEAN POLICY, Appendix 6 in AN OCEAN BLUEPRINT FOR THE 21<sup>ST</sup> CENTURY at n.14 (2004), [https://govinfo.library.unt.edu/oceancom mission/documents/full\\_color\\_rpt/append\\_6.pdf](https://govinfo.library.unt.edu/oceancom mission/documents/full_color_rpt/append_6.pdf). On September 7, 2017, NOAA announced the approval of the five-year extension of Deep Seabed Mining Exploration License USA-1 and Deep Seabed Mining Exploration License USA-4, filed by Lockheed Martin Corporation (LMC). Deep Seabed Mining: Approval of Exploration License Extensions, 82 Fed. Reg. 42327 (Sep. 7, 2017), <https://www.federalregister.gov/documents/2017/09/07/2017-18994/deep-seabed-mining-approval-of-exploration-license-extensions>. Today, two exploration licenses remain in effect, both held by LMC. See R. Kerry Kehoe, *NOAA and Deep Seabed Hard Mineral Exploration and Recovery*, NOAA OFFICE FOR COASTAL MANAGEMENT at slide 5, <https://mrf.org/wp-content/uploads/2020/01/KerryKehoe Presentation.pdf>.

38. Nandan, *supra* note 24, at 16E-4 (citing to the Agreement Relating to the Implementation of the Part XI of the United Nations Convention on the Law of the Sea, Dec. 10 1982, A/RES/48/263, Annex, § 3 para. 11(a)).

39. Casson, *supra* note 11 (providing a listing of the governments and contractors that have been

host of others.<sup>40</sup> As of mid-2019, the ISA has issued thirty 15-year exploration contracts<sup>41</sup> and it is estimated that roughly 1.2 million square kilometers are now under various mineral prospecting permits.<sup>42</sup> This is roughly equivalent to twice the entire water area of the United States.<sup>43</sup>

The picture of seabed mining and the role of law in this activity go far beyond the ISA and non-territorial waters. Much of the territory deemed most desirable—both because of mineral content and the relative ease of accessing the resource and nearby land from which to stage operations—exists within the territorial waters, the Exclusive Economic Zones (EEZs) or the extended continental shelf areas of a large number of countries.<sup>44</sup> Individual countries exercise sovereign jurisdiction over their marine environments, airspace, and the bed and soil of their territorial waters.<sup>45</sup> In addition, these jurisdictions enjoy sovereign rights to the living and nonliving resources contained in their EEZs,<sup>46</sup> and sovereign rights for exploring and exploiting the natural resources found in their own claimed continental shelf areas.<sup>47</sup>

Consequently, the work of the ISA, which systematizes and stabilizes the regulatory regime relating to the exploration and exploitation of the minerals found outside any nation's jurisdiction, is largely irrelevant to a large portion of potential seabed mining and exploration activity. Instead, there is great variability with respect to the regulatory frameworks addressing seabed exploration and mining among the world's coastal countries.

Some countries have developed regulatory structures that clearly indicate participation from the scientific and legal communities. From existing models, one can piece together that current and future seabed mining regulation should meet the following core governance objectives. A stable regulatory structure must: i) balance environmental protection with the desire for economic growth,<sup>48</sup>

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granted contracts for deep sea mining exploration within the Area, by largest area).

40. *Deep Seabed Minerals Contractors*, ISA, <https://www.isa.org.jm/deep-seabed-minerals-contractors>. See also David Shukman, *Deep Sea Mining Licences Issued*, BBC NEWS (July 23, 2014), <http://www.bbc.com/news/science-environment-28442640>.

41. *Id.* (“Eighteen of these contracts are for exploration for polymetallic nodules in the Clarion-Clipperton Fracture Zone (16), Central Indian Ocean Basin (1) and Western Pacific Ocean (1). There are seven contracts for exploration for polymetallic sulphides in the South West Indian Ridge, Central Indian Ridge and the Mid-Atlantic Ridge and five contracts for exploration for cobalt-rich crusts in the Western Pacific Ocean.”).

42. Shukman, *supra* note 40.

43. *Geography Statistics of United States of America*, WORLDATLAS, <https://www.worldatlas.com/webimage/countrys/namerica/usstates/uslandst.htm>.

44. *Deep Sea Minerals: Summary Highlights*, SECRETARIAT OF THE PACIFIC COMMUNITY-EUROPEAN UNION, [https://dsm.gsd.spc.int/public/files/meetings/TrainingWorkshop4/UNEP\\_summary.pdf](https://dsm.gsd.spc.int/public/files/meetings/TrainingWorkshop4/UNEP_summary.pdf).

45. UNCLOS, art. 2, para. 1-3. See also UNCLOS, art. 33 (defining the “Contiguous Zone,” which provides a nation the right to assert its sovereign enforcement rights over matters related to customs, fiscal, immigration, and sanitary laws that apply in its territory or in its territorial waters).

46. UNCLOS, art. 56, para. 1 (decreeing that within the EEZ, a state has “Sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, whether living and nonliving, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds”). See also *What is the EEZ?*, NOAA (Nov. 13, 2019), <https://oceanservice.noaa.gov/facts/eez.html>.

47. UNCLOS, art. 77-78, 81.

48. See Charles Douglas Oliver, *Interim Deep Seabed Mining Legislation: An International*

create a stable and predictable set of rights and obligations between the parties,<sup>49</sup> and establish reasonable mechanisms for objective dispute resolution;<sup>50</sup> ii) include a robust community consultation/consent process and recognize the valuable contributions of each party;<sup>51</sup> iii) ensure high revenue streams for the government and, ultimately, for the benefit of the people it serves;<sup>52</sup> and iv) embed the best knowledge available regarding ecological management and conservation.<sup>53</sup> These governance objectives will be further discussed in this Article.<sup>54</sup>

While clearly in need of improvement and updating,<sup>55</sup> the United States has a relatively developed regulatory structure. Through its National Oceanic and Atmospheric Administration, the United States has developed a regulatory framework that has thus far impeded sea-based mining enterprises from establishing operations within its territorial waters or the United States' EEZ and continental shelf.<sup>56</sup> Australia has similarly adopted a regulatory approach that has thus far prohibited sea-based mining activity.<sup>57</sup> Large economic powers such as Australia and the United States have a high level of legal capacity and also significant experience with regulating land-based mining. Therefore, governing seabed mining, while posing novel challenges and uncertainties, has not been entirely unfamiliar.<sup>58</sup>

*Environmental Perspective*, 8 J. LEGIS. 73 (1981) (detailing the importance of environmental protection in seabed legislation).

49. See generally, e.g., *Model Law on Mining on Community Land in Africa*, INTERNATIONAL ALLIANCE ON NATURAL RESOURCES IN AFRICA, <http://eacsof.net/EACSOFF/2016/08/22/model-law-on-mining-on-community-land-in-africa/>.

50. *Id.* at 55-58.

51. *Id.* at 13-29.

52. See James D. Friedland, *Under the Territorial Sea: Reforming U.S. Mining Law for Earth's Final Frontier*, 61 UCLA L. REV. 1548, 1598-1599 (2014) (arguing that revenues from sea-based mining must be substantial in order to fund government objectives and to offset inevitable environmental harms).

53. *Id.*

54. See *infra* Section IV.B.

55. For an exposition of U.S. regulations for the issuance of offshore mineral mining leases and an evaluation of potential improvements to the current regulatory structure, and particularly a discussion of the Outer Continental Shelf Lands Act of 1953, see generally Friedland, *supra* note 52. See also 43 U.S.C. §§ 1301-1315 (2006); 15 CFR § 970.100; Deep Seabed Hard Mineral Resources Act, 30 U.S.C. §§ 1401-1473 (2002).

56. According to a representative of the Bureau of Ocean and Energy Management (BOEM), over the past 10 years, BOEM has issued one "prospecting permit for exploration of marine minerals in the Alaska OCS Region" but none for phosphate, manganese nodules, C4 sulfides or cobalt-rich crust. See email from Sara B. McPherson to Margaret Kiel-Morse (Jan. 15, 2020) (on file with author).

57. See *State of the Environment, Marine Mining and Industry*, COMMONWEALTH OF AUSTRALIA (2016), <https://soe.environment.gov.au/theme/marine-environment/topic/2016/marine-mining-and-industry>.

58. New Zealand, also familiar with land-based mining, placed a moratorium on exploration and mining in coastal waters off the Northern Territory from 2012-2015. See *Interim Report: Seabed Mining in the Northern Territory*, NORTHERN TERRITORY EPA, app. At 74 (Mar. 6, 2012), [https://ntepa.nt.gov.au/\\_data/assets/pdf\\_file/0006/284910/Seabed-Mining-Report.pdf](https://ntepa.nt.gov.au/_data/assets/pdf_file/0006/284910/Seabed-Mining-Report.pdf). In 2015, the New Zealand Environmental Protection Agency approved an application by Trans-Tasman to mine iron sands near Patea, New Zealand. See Valentina Ruiz Leotaud, *Seabed Mining Approved in New Zealand Despite Environmentalists' Concerns* (August 17, 2017), <https://www.boem.gov/sites/default/files/about-boem/BOEM-Regions/Alaska-Region/Leasing-and-Plans/Leasing/Alaska-Detailed-Listing-of-Active-Leases.pdf>. This license has been the subject of legal battles since 2018 when the High Court of New Zealand found the original license was inappropriately granted. An appeal of that decision began in September 2019 and is stiffly opposed by local environmental and fishing groups. See *Appeal Begins Over*



Quite another legal, regulatory, and economic story prevails in many other countries, however. Many coastal countries, particularly Pacific Island nations, are scrambling to enact legislation quickly enough to deal with oil, gas, and mineral operations at sea.<sup>59</sup> These countries have neither significant prior experience with the mining sector nor the legal, technical, and administrative capacity to adequately regulate seabed mining, which is, at once, both potentially lucrative and potentially ruinous. On the one hand, seabed mining has the potential to provide much-needed economic revenue to countries whose land-based natural resources are not substantial. Mineral resource extraction, if well managed, has the potential to establish revenue streams that could finance health, education, and infrastructure investments in these countries. However, as with land-based natural resources, these potential revenues must be both realized and well managed if their exploitation is to assist in financing such social and economic projects. On the other hand, beyond the revenue management questions so prevalent in the literature pertaining to land-based natural resources, a variety of novel and unknown environmental and social issues also arise.

In the case of countries whose land-based natural resources have not been previously exploited on a significant scale, the environmental and social issues will be particularly noteworthy. The social and environmental impacts of mining have the potential to be significantly more harmful than any other activity with which these countries have first-hand experience. In the case of countries that have traditionally relied heavily on their marine territory and EEZ for economic benefits from fishing or for other aspects of their well-being, such as a basic relationship to a healthy ocean, the potential impacts from seabed mining may be particularly pronounced. Unfortunately, these countries' historic inexperience with mining also means that their regulatory structure is significantly underdeveloped. There is little prospect for developing the technical or legal innovations and capacity necessary to prepare these countries to adequately regulate seabed exploration and exploitation, such that they can achieve the goal of maximizing the potential benefits of mining while minimizing potential harms.

This Article will focus mainly on one such country—the Republic of Vanuatu—which serves as an example of the current situation of Pacific Island nations. Vanuatu offers a compelling case study of the role that contracts must play in creating strong frameworks for seabed mining activity.

Vanuatu's relative lack of experience with the mining sector, weak legal infrastructure regulating mining, and lack of access to the financial resources necessary to rapidly buttress this legal infrastructure reveals a regulatory lacuna that is common to many of the countries being targeted by seabed mining companies for access to the natural resources within their control. Thus, while

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*Seabed Mining for Ironsands off Taranaki Coast*, STUFF.COM (Sep. 25, 2019), <https://www.stuff.co.nz/business/116015151/appeal-begins-over-seabed-mining-for-ironsands-off-taranaki-coast>.

59. Richard Johnson, Manager of EEZ Applications, New Zealand EPA, Presentation at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference hosted by the Vanuatu National Offshore Minerals Committee, Port Vila, Vanuatu (Oct. 7-9, 2014) (notes on file with the author).

Vanuatu is unique—with its particular legal structure, experience with mining, culture, and national objectives—it serves as an apt example of a country in which contracts can play an essential role in filling regulatory gaps. Like in other countries with thin regulatory structures, the contract between the government of Vanuatu and the companies applying for permission to explore for (and, later, to exploit) natural resources can supplement or create conditions and constraints on the companies' activities, establish adequate revenue-sharing, and require accountability and responsibility for both the anticipated and unanticipated environmental and social impacts of seabed mining.

In the context of novel activity such as seabed mining, contracts offer other highly desirable characteristics. In comparison to statute-based governance approaches, contracts offer relative mutability, flexibility, and nimbleness. They allow for innovative governance strategies that incorporate the evolving and deepening knowledge about the environmental value of the ocean and its contents as well as the environmental and social costs of mining its floor. Contracts are thus well-suited to translating governance theories into applied realities governing contracting parties' behaviors and their relationships to one another. In this way, and in this novel context, contracts are better equipped to create enforceable regimes around concepts such as free, prior and informed consultation/consent (FPIC);<sup>60</sup> the precautionary principle;<sup>61</sup> adaptive management;<sup>62</sup> and an approach to commercial relations that is structured around ecological and human well-being rather than around economic growth.<sup>63</sup> This Article argues that particularly because what is most known about the ocean is that much is still unknown, these features of contracts are especially desirable.

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60. Free, prior and informed consent (or consultation) “requires actors to solicit and obtain the consent of indigenous communities prior to undertaking projects that may impact their territories or resources.” Julian Aguon & Julie Hunter, *Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Scheme*, 38 STAN. ENVTL. L.J. 3 (2018). “Free” requires that consent be freely given without duress, “prior” necessitates that the consent be received before the operation begins, and “informed” means full disclosure of information regarding all aspects of a proposed project or activity in a manner that is accessible and understandable to the people whose consent is being sought.” *Free, Prior and Informed Consent (FPIC)*, EARTHWORKS (2019), <https://earthworks.org/issues/fpic/>.

61. The precautionary principle requires that “when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically” . . . [there are] four central components of the principle: taking preventative action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making.” David Kriebel, et. AL., *The Precautionary Principle in Environmental Science*, 109 ENVTL. HEALTH PERSPECTIVES 871, 871 (2001) (quoting and citing PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT: IMPLEMENTING THE PRECAUTIONARY PRINCIPLE (C. Raffensperger & J. Tickner, eds., Island Press 1999)).

62. “Adaptive management is a systemic approach for improving resource management by learning from management outcomes . . . An adaptive approach involves exploring alternative ways to meet management objectives, predicting outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions.” BYRON K. WILLIAMS, ET. AL., ADAPTIVE MANAGEMENT: THE U.S. DEPARTMENT OF THE INTERIOR TECHNICAL GUIDE (2009).

63. These are concepts that emerged during Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference as essential to any consent that may be given through an FPIC process. See generally photos of conference wrap-up posters in which participants in the conference described their then-current thinking about seabed mining in Vanuatu’s waters (on file with author).

Almost all countries have some form of mining law, and in some countries the primary source of obligations will be found in legislation and a set of mining regulations. In these systems, companies establish their operations through licenses to mine particular geographic space and the licenses are subject to all relevant legislation and regulations, including environmental management, royalties, etc.<sup>64</sup> Very few countries rely exclusively on contracts for regulating mining investments, but many countries with mining laws continue to employ contracts to establish the terms of the relationship between the state and the company.<sup>65</sup> Generally speaking, the same obligations can ensue, whether established through legislation or through contracts. Among the benefits of legislation and regulation is the higher likelihood, historically, that the law is publicly available and that there might have been some opportunity for public notice and comment as the laws were being formed. In addition, violations of the law can result in state-imposed civil or criminal penalties, which may serve as more effective incentives for compliance. However, in locations where the mining laws have not yet been fully developed, particularly with respect to seabed mining, contracts must fill the regulatory void left by sparse public law. In relation to novel commercial activity, such as seabed mining, contracts can also serve additional useful functions as discussed herein.

To establish some necessary background, Part I provides additional information about seabed mining, offering a brief history and discussing the locations where this activity is commencing. In doing so, Part I will provide some detail of the mining industry's interest in marine territory within the ISA's jurisdiction as well as its interest in territory that lies within the jurisdiction of individual countries. Part II then focuses on this second category—marine territory that is subject to the jurisdiction of individual countries. In doing so, Part II distinguishes between countries that (largely due to experience and pre-existing capacity) have taken relatively strong regulatory approaches and those that have not yet done so. Part III provides additional detail about the Republic of Vanuatu, a country that has not yet adopted a strong regulatory structure. Part III will describe Vanuatu's experience to date with the mining industry's interest in its territorial waters and EEZ. It describes how mining companies became involved in Vanuatu, as well as the growing interest in Vanuatu's evolving approach to seabed mining activity. This background brings into strong relief the pressing need for the additional protections for Vanuatu's government, people and environment if mining activity is to move forward. Given that statutory approaches have been slow and sparse, the contracts between the government and the mining companies could serve as a governance mechanism born of necessity. Part IV discusses how a contract must and can serve a necessary regulatory role in such situations. It describes key contractual provisions that are essential for contracts to serve this stopgap function. Part IV also discusses the role of contracts in this context where global ignorance prevails—both about the activity and about the environment in which it will occur. Part IV will provide

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64. *Mining Contracts: How to Read and Understand Them*, NATURAL RESOURCE GOVERNANCE INSTITUTE 36, <https://eiti.org/document/mining-contract-how-to-read-understand-them>.

65. *Id.* at 35.

examples of contractual provisions that can incorporate evolving information about the ocean and about seabed mining on the one hand, and novel governance approaches that may be difficult or impossible to build into statute-based regulatory approaches on the other. The Article concludes by providing concrete suggestions for contractual innovations for countries contemplating seabed mining. Regardless of whether contracts serve stopgap functions, innovating functions, or both, many countries moving forward with seabed mining will be well served by closely investigating the terms on which they issue licenses for seabed prospecting and exploitation.

## I. EXPERIMENTAL SEABED EXPLORATION AND MINING

### A. *A Brief History of Seabed Exploration and Mining*

Phosphorite nodules were first discovered on the seabed in 1873 by the crew of the HMS Challenger,<sup>66</sup> the ship that acted “as a floating lab for the world’s first large-scale oceanographic expedition, circumnavigating the globe and dredging up samples of never-before-seen creatures from the ocean floor.”<sup>67</sup> During the early part of the 20th century, manganese nodules, seafloor massive sulfides, and cobalt-rich ferromanganese crusts were also identified and studied by scientific voyages. Starting in the second half of the 20th century, the mineral content of these geologic features, which contain copper, zinc, gold, silver, manganese, cobalt, molybdenum, and rare earth elements, began to draw significant attention.<sup>68</sup> From 1978 to 1979, a seabed exploration company used another ship, the Hughes Glomar Explorer, to extract polymetallic nodules from the seafloor.<sup>69</sup>

Until recently, two factors have impeded the commercial viability of mining the seabed: 1) sufficient accessible land-based mineral deposits that have led to relatively low market prices and 2) insufficient technology and machinery to access and mine the seabed. Both of these factors have begun to shift. For each of the past five years, the Deep Sea Mining Summit has evidenced growing and

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66. THE GEOLOGY OF CONTINENTAL MARGINS, 650 (C.A. Burk & C.L. Drake eds., 1974), [https://books.google.com/books/about/The\\_Geology\\_of\\_Continental\\_Margins.html?id=vqLyCAAQBAJ](https://books.google.com/books/about/The_Geology_of_Continental_Margins.html?id=vqLyCAAQBAJ).

67. Kate Golembiewski, *H.M.S. Challenger: Humanity’s First Real Glimpse of the Deep Oceans: The story of one of the most important expeditions in history*, DISCOVER (Apr. 19, 2019), <https://www.discovermagazine.com/planet-earth/hms-challenger-humanitys-first-real-glimpse-of-the-deep-oceans>.

68. *Deep Sea Minerals: Summary Highlights*, *supra* note 44, at 3.

69. Mineral resources of the deep seabed. Hearings, Ninety-third Congress, first[-second] session, on S. 1134.1 at 383 (1973). The history of the Hughes Glomar Explorer is itself fascinating. The ship was built by the CIA to extract the wrecked Soviet ballistic missile nuclear submarine from its final resting place three miles below the surface of the Pacific Ocean. As a cover story for this highly-visible endeavor, “[f]rom about 1970-74, the CIA managed to convince the world that billionaire inventor Howard Hughes had decided to invest millions to mine ‘manganese nodules,’ balls of heavy metals that lie on the ocean floor. Via fake press releases, events, technical specs and front companies, the CIA convinced the world that Hughes was leading a new ocean-mining rush.” See Julia Barton, *Confirmed: The CIA’s Most Famous Ship Headed for the Scrapyard*, THE WORLD (Sep. 7, 2015), <https://www.pri.org/stories/2015-09-07/ship-built-cias-most-audacious-cold-war-mission-now-headed-scrapyard>.

intensifying global interest in mining the ocean's floor.<sup>70</sup> The description for the 2020 event states:

As we move into an era of mining the deep-ocean floor, the world's most remote environment, mining companies are working on overcoming the perceived challenges and developing island nations are watching with interest. As the demand for base metals and minerals surges ever beyond what our land is able to provide, new technological and technical developments are helping to drive forward this new industry.<sup>71</sup>

The result is that interest in mining both within sovereign marine territory and in the Area beyond it has increased. As stated above, the ISA is actively engaged in issuing prospecting licenses to enterprises from a large number of countries, and at least three companies (DeepGreen,<sup>72</sup> Nautilus Minerals<sup>73</sup> and Neptune Minerals Group<sup>74</sup>) have made significant investments in seabed mining within the territory of coastal nations.

The regulatory regime governing the Area or the "High Seas" differs from the regulatory regime governing the sovereign seabed of each coastal nation. Before moving on in Part II to discussing the general development of national regulatory developments with respect to seabed mining, the following section will briefly describe the regulatory regime governing the Area.

### *B. International Waters*

The high seas have always been the earth's great common space, covering more than seventy percent of the earth's surface. The customary law of the high seas and the absence of regulation were the predominant paradigms<sup>75</sup> until the emergence of the concept of EEZs, and the 1994 entry into force of the United Nations Convention on the Law of the Sea ("UNCLOS").<sup>76</sup>

UNCLOS was signed in 1982 and entered into force in 1994.<sup>77</sup> Part XI of

70. THE DEEP SEA MINING SUMMIT 2020, <http://deepsea-mining-summit.com/>.

71. *Id.*

72. *Sponsoring States*, DEEPGREEN, <https://deep.green/sponsoring-states/>.

73. NAUTILUS MINERALS, <https://web.archive.org/web/20200225201116/http://www.nautilusminerals.com/IRM/content/default.aspx>. Nautilus has filed for bankruptcy, as executed by PricewaterhouseCoopers. *Nautilus Minerals Inc.*, PWC CANADA (Nov. 21 2019), <https://www.pwc.com/ca/nautilus-minerals>. An internet search for Nautilus Minerals directs web users to the website of Deep Sea Mining Finance, which describes itself as "a privately owned group aiming to become the first in the world to mine Seafloor Massive Sulphide ("SMS") deposits commercially, starting with its high grade copper-gold Solwara 1 project ("Solwara 1") in the territorial waters of Papua New Guinea ("PNG"). DSMF is a joint venture between international holding group "USM Holdings Limited" and Sultanate of Oman group "MB Holding Company LLC." See DEEP SEA MINING FINANCE, <https://dsmf.im/>.

74. *Tenements*, NEPTUNE MINERALS - DEEP OCEAN MINERALS EXPLORATION AND RESOURCE DEVELOPMENT, <http://www.neptuneminerals.com/our-business/tenements>.

75. Notable exceptions would include the laws pertaining to ship seizures under the laws of war, prohibitions on piracy on the high seas, and the international agreements to regulate slave trading vessels. For an excellent account of the laws regulating slave trading ships, see Jenny Martinez, *Antislavery Courts and the Dawn of International Human Rights*, 117 YALE L.J. 550 (2007). For a more general account of the treatment of ships under customary international law, see Jack L. Goldsmith and Eric A. Posner, *Understanding the Resemblance between Modern and Traditional Customary International Law*, 40 VA. J. INT'L L. 639, 641-51 (2000).

76. UNCLOS, *supra* note 33.

77. As of February 9, 2020, the UNCLOS had 157 signatories and 168 parties. *Status of United Nations Convention on the Law of the Sea*, UNITED NATIONS TREATY COLLECTION DEPOSITORY.

the UNCLOS, and the 1994 Implementation Agreement relating to Part XI, establish the legal framework for seabed mining and scientific research in the Area. The general principle that the High Seas are the common heritage of mankind is imbedded in UNCLOS, including in the sections pertaining to seabed minerals. For example, it sets out explicitly that the resources in the Area pertain to mankind, all activity carried out in the Area must benefit mankind as a whole, including equitable allocation of economic gains, and may only be recovered and sold under the rules established by UNCLOS and the ISA.<sup>78</sup>

UNCLOS, Article 145, requires the protection and conservation of the Area's natural resources and the protection of the marine environment and, in other sections, charges states party with the preservation of the marine environment, including requiring that each state party develop domestic rules regarding pollution from seabed activities.<sup>79</sup> In addition, Article 146 requires that "necessary measures shall be taken to ensure the effective protection of human life" with respect to activities in the Area.<sup>80</sup>

UNCLOS also establishes the rules governing payments and contributions in kind that must be made by states party, or companies sponsored by states party, with respect to revenue from the exploitation of nonliving resources in the Area.<sup>81</sup> UNCLOS and its attendant documents also lend attention to disputes arising from activities in the Area and the settlement of those disputes.<sup>82</sup> The Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, established under UNCLOS, Annex VI, serves as the primary body for the settlement of seabed disputes. UNCLOS, Annex VII and Annex VIII also anticipate that states parties will submit conflicts to arbitration and establish basic rules for those proceedings.

UNCLOS, which includes 320 Articles, in addition to nine annexes, an Agreement Relating to the Implementation of Part XI (governing the Area), a number of recommendations, a model contract, and a set of standard clauses for exploration contracts, establishes at least the beginning of a regulatory framework for the exploration and exploitation of natural resources in the Area and establishes institutions to implement these documents.

The chief regulatory body established under UNCLOS is the ISA, which was established with the entry into force of UNCLOS. Each of the 168 states parties to UNCLOS<sup>83</sup> are members of the ISA. Within the ISA, the Council is the ISA's executive body. "It establishes specific policies and approves applications for exploration or exploitation rights. It has the power to oversee implementation of seabed provisions of the Convention and the Implementing Agreement."<sup>84</sup>

Since its establishment, the ISA has developed regulations on prospecting

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78. UNCLOS, arts. 133–43.

79. *Id.* at arts. 145, 192, 194, 195, 208, 209.

80. *Id.* at art. 146.

81. *Id.* at art. 82.

82. *Id.* at part XV.

83. *Status of United Nations Convention on the Law of the Sea*, *supra* note 77.

84. *The International Seabed Authority*, *supra* note 32.

and exploration of polymetallic nodules, polymetallic sulphides, and cobalt-rich ferromanganese crusts. These regulations govern the applications to the ISA by states party, or companies sponsored by states party, for 15-year contracts granting exclusive rights to explore delineated tracts of seabed within the Area.

## II. NATIONAL TERRITORIES

### A. *National Territorial Waters, EEZs, and Extended Continental Shelf Territories*

The development of exclusive economic zones and the potential for coastal states to extend sovereign rights into extended continental shelf territories has greatly limited the space previously governed by the law of the high seas: “roughly 35 percent of ocean space is part of the exclusive economic zones claimed by coastal states today.”<sup>85</sup>

Article 3 of UNCLOS establishes that the territorial sea of each continental nation extends for 12 nautical miles into the sea, measured from baselines<sup>86</sup> determined according to the Convention.<sup>87</sup> Each coastal state is also entitled to establish an exclusive economic zone that extends 200 nautical miles into the sea from those same baselines.<sup>88</sup> Coastal nations enjoy “sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or nonliving, of the waters superjacent to the seabed and of the seabed and its subsoil.”<sup>89</sup> Finally, coastal nations may, under Article 76(5), register a claim and exercise sovereign rights over the exploration and exploitation of natural resources over an extended continental shelf region of up to 350 nautical miles from the baselines.<sup>90</sup> The part of the ocean that does not fall into any of these three sovereign claims is defined as the Area, over which the ISA has regulatory jurisdiction, as described above.

As Figure 1 above illustrates, a large amount of the mineral and rare earth wealth on the floor of the Pacific Ocean lies within the sovereign territorial seas, EEZs, and continental shelf regions of individual countries. It is well beyond the scope of this paper to survey the variety of legal and regulatory structures present in each of the world’s 152 coastal nations. It is worth noting, however, that coastal nations’ regulatory structures with respect to prospecting, exploration, and mining vary considerably. Moreover, because the domestic rules that govern mineral exploration and mining, to the extent they exist, were developed to address land-based mining, they are predictably inapt in the context of seabed mining. Few coastal countries have, until recently, developed legal or regulatory structures to address this activity.

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85. THOMAS DUX, *SPECIALLY PROTECTED MARINE AREAS IN THE EXCLUSIVE ECONOMIC ZONE (EEZ): THE REGIME FOR THE PROTECTION OF SPECIFIC AREAS OF THE EEZ FOR ENVIRONMENTAL REASONS UNDER INTERNATIONAL LAW* 1 (2011).

86. UNCLOS, art. 3.

87. *Id.* at arts. 2–16.

88. *Id.* at art. 57.

89. *Id.* at art. 56.

90. *Id.* at art. 76(5).

*B. Governments with Stronger Regulatory and Administrative Frameworks*

In countries with established land-based mining economies, existing and adaptable regulatory frameworks may render contracts less necessary, since environmental protection, taxation, royalty rates, and other concerns may be addressed through legislation and regulation. However, even in these locations, contracts may be used to fill gaps in the application of regulations, to deviate from non-mandatory public law or in order to bring governments already familiar with land-based mining into compliance with the requirements of good governance in seabed mining. The following case studies, although each displaying varying statutory achievements and shortcomings, provide a backdrop against which to compare countries where existing mining legislation must be supplemented by contracts in order to effectuate basic environmental, commercial, and social aims. Each of the countries highlighted in Part II.B demonstrates that legislation for seabed mining can and should include structures of accountability in order to be effective. As stated in the Introduction, such structures should i) balance environmental protection with the desire for economic growth<sup>91</sup> create a stable and predictable set of rights and obligations between the parties,<sup>92</sup> and establish reasonable mechanisms for objective dispute resolution;<sup>93</sup> ii) include a consultation process and recognize the valuable contributions of each party;<sup>94</sup> iii) ensure high revenue streams for the government and, ultimately, for the benefit of the people it serves;<sup>95</sup> and iv) embed the best knowledge available with regard to ecological management and conservation. Where public law does not provide these structures, contracts should act to enhance the regulatory environment.

*1. First Example: United States*

The United States, which is the most economically powerful country not party to the UNCLOS, is also the country with the most developed technology and machinery appropriate for seabed mining. The United States also has a relatively well-developed statutory and administrative capacity with which to address seabed mining, and thus ostensibly should meet the first governance objective for seabed mining legislation by establishing a stable and predictable system of rights. The Outer Continental Shelf Lands Act (OCSLA) governs seabed mining in the continental shelf and EEZ regions of the United States.<sup>96</sup> The country also has ample federal regulations governing offshore mineral

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91. See Oliver, *supra* note 48 at 73 (detailing the importance of environmental protection in seabed legislation).

92. See generally, e.g., MODEL LAW ON MINING ON COMMUNITY LAND IN AFRICA, INT'L ALL. ON NAT. RES. IN AFR. (2016), <http://eacsof.net/EACSOFF/2016/08/22/model-law-on-mining-on-community-land-in-africa/>.

93. *Id.* at 55-58.

94. *Id.* at 13-29.

95. See Friedland, *supra* note 52 at 1598-1599 (arguing that revenues from sea-based mining must be substantial in order to fund government objectives and to offset inevitable environmental harms).

96. Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. § 1331.



prospecting and leasing, such that lease parameters, formulas for determining royalties and methods of valuation are addressed through federal regulations.<sup>97</sup> Finally, with respect to mining in the high seas, the United States filled the regulatory gap left as a result of not being a state party to the UNCLOS by passing the Deep Seabed Hard Minerals Resources Act,<sup>98</sup> which steps outside the international framework adopted by the vast majority of countries. This Act, which is implemented by the National Oceanic and Atmospheric Administration, sets forth rules governing mining development in the high seas. NOAA also administers the Deep Seabed Mining Regulations for Exploration Licenses<sup>99</sup> and the Deep Sea Mining Regulations for Commercial Recovery Permits.<sup>100</sup>

Taken together, these federal statutes and regulations constitute a regulatory structure that is well developed compared to the legal and regulatory structures present in or available to many coastal nations. Also, despite relatively comprehensive language necessitating baseline environmental reports and environmental impact statements under NOAA requirements, those requirements are not always satisfactorily applied.

In the event of agency failure, or disagreement between the public and the agency about the agency's responsibilities, the availability of a well-developed court system to hear and adjudicate disputes serves as a necessary buttress on the legal infrastructure designed to regulate seabed mining and the enforcement of environmental protections embedded in that infrastructure and fills a key requirement for effective seabed mining governance. For example, in May 2015, the Center for Biological Diversity filed a claim for declaratory relief against the Secretary of Commerce and NOAA regarding NOAA's "decision to grant two exploratory licenses for mining in the deep ocean [outside of territorial waters] without analyzing the environmental effects of doing so."<sup>101</sup> The complaint, which objects to NOAA's decision to grant two license extensions to Lockheed Martin Corporation for exploration in the Clarion Clipperton Zone, asserts that NOAA failed to perform environmental analysis in granting the license extensions, despite statutory requirements.

Some might argue that this incident and the existence of a complaint suggest a governance failure. If the allegations in the complaint are true, this argument would run, then NOAA did not adequately implement the statute and properly execute its administrative functions. When one considers the role of the courts in a well-developed legal system, however, the complaint might be viewed as cause for comfort, if one also recognizes that the result of the complaint in this case was a clarification from NOAA that under the current license extensions, Lockheed Martin will not engage in at-sea exploration activities. Rather, Lockheed Martin is in what it calls "Phase I," "a preparatory stage which includes activities for which no license would be required."<sup>102</sup>

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97. *E.g.*, 30 C.F.R. § 559, 580–582.

98. 30 U.S.C. § 1401.

99. 15 C.F.R. § 970.

100. *Id.*

101. *Center for Biological Diversity v. Pritzker*, No. 15-0723 at 2 (D.D.C. 2015).

102. *Extension of Deep Seabed Exploration Licenses, Response to Comments*, DEPARTMENT OF

## 2. *Second Example: Australia*

Australia, a coastal state with a well-developed mining code, takes a stance that is generally recognized as being “open for business” due to its stable mining regulations and transparent court system for mining-related dispute resolution. Australia systematically developed a state-by-state legal framework designed to protect mining interests and was named the world’s most secure site for mining investments by the Behre Dolbear group in 2005.<sup>103</sup>

Still, Australia’s Northern Territory came under fire in 2012 when the Northern Territory’s government revoked 11 offshore mining licenses held by BHP Billiton, Northern Manganese, and Yukida Resources.<sup>104</sup> The revocations provoked all three companies that had been in talks with the government, and Northern Manganese has threatened suit, claiming more than \$1 billion would be necessary to compensate the company for its losses.<sup>105</sup> The licenses were revoked in connection with a ban placed on seabed mining by the Northern Territory Government that began in 2012 and has been extended through 2021.<sup>106</sup>

It is notable that Australia’s legal framework for land mining is primarily under the purview of individual states, and accordingly each state has created its own mining management process in compliance with the relevant environmental regulations.<sup>107</sup> This variation in regulatory structure may not be conducive to upholding robust environmental management standards when applied to seabed mining. Still, per the 1994 Offshore Minerals Act, mineral exploration and mining activities can only happen in Australian waters with approval from the relevant Joint Authority.<sup>108</sup> This Joint Authority is made up of the responsible federal minister and the responsible state or Northern Territory minister, ensuring cohesive action between the two levels of government. However, since seabed mining in the Australian EEZ falls at least partially under federal jurisdiction, the development of centralized environmental standards may help keep future seabed mining ventures in compliance with best ecological management practices, the fourth aforementioned tenet of good governance.

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COMMERCE, NOAA, 1–3, 80 Fed. Reg. 250 (Dec. 30, 2015), <https://www.gpo.gov/fdsys/pkg/FR-2015-12-30/pdf/2015-32889.pdf> (last visited Mar 18, 2016). *See also*, Settlement Agreement, *Center for Biological Diversity v. Penny Pritzker*, D. Dist. Colum. Settlement (2016) (on file with author).

103. Robin H. Chambers, *An Overview of the Australian Legal Framework for Mining Projects in Australia*, CHAMBERS AND COMPANY INTERNATIONAL LAWYERS, <http://www.chamberslawyers.com/wp-content/uploads/downloads/2013/10/060518-Presentation-Eng.pdf>.

104. *See* Andrew Burrell, *Court Clash Looms on BHP Seabed Ban*, THE AUSTRALIAN (Sept. 10, 2013), <https://www.theaustralian.com.au/business/mining-energy/court-clash-looms-on-bhp-seabed-ban/news-story/709ddf4e630f1dec5c7e1cff39dfc6>.

105. *Id.* *See also* Andrew Burrell, *Mining Lobby Demands Compo*, THE AUSTRALIAN (Sept. 11, 2013), <https://www.theaustralian.com.au/business/mining-energy/mining-lobby-demands-compo/news-story/a494840df91a1525bf10dd77cacbaa74>.

106. *See* Jacqueline Breen, *NT Seabed Mining Moratorium Extended, Drawing Mixed Reaction From Stakeholders*, ABC NEWS (May 15, 2018), <https://www.abc.net.au/news/2018-05-16/nt-seabed-mining-moratorium-extended-three-years/9764622> (stating that the seabed mining moratorium is the result of “concerns about potential environmental impacts.”).

107. Chambers, *supra* note 103.

108. *Offshore Minerals Act 1994* (Austl.) pts 1.3, 2.

### 3. Third Example: New Zealand

New Zealand is yet another example of a country whose regulatory regime with respect to mining activity within its EEZ and continental shelf is relatively well developed. New Zealand's regulatory regime is reasonably equipped to meet the suggested requirements for effective governance of seabed mining. New Zealand's Exclusive Economic Zone and Continental Shelf Act 2012 was drafted recently enough to contemplate seabed mining in its definitions and substantive provisions.<sup>109</sup> For example, Section 20 of the Act restricts the type of disturbances that would be inevitable in seabed mining: e.g., deposits into the water column; deposits of material onto the seabed; and creating light and vibrations and explosions.<sup>110</sup>

In addition, the New Zealand Environmental Protection Authority is relatively well equipped to receive applications and make decisions about seabed activity.<sup>111</sup> In the case of New Zealand, this is essential, as the country boasts "one of the largest Exclusive Economic Zones in the world, 20 times the size of [their] land mass."<sup>112</sup> It thus has experienced agencies charged with implementing regulations and balancing the commercial and environmental interests implicated in marine mining in furtherance of the Act's goal, which is to promote the sustainable management of the area's natural resources.<sup>113</sup> As the manager of EEZ applications for the New Zealand EPA described during Vanuatu's First National Deep Sea Minerals Policy Consultation in 2014, governments must favor caution and environmental protections when information is uncertain or inadequate, as it is in the context of seabed mining.<sup>114</sup> In addition, in the event that legal and administrative structures fail, New Zealand's court system is well positioned to handle complaints.

In February 2015, New Zealand's Environmental Protection Agency denied an application by Chatham Rock Phosphate Limited for a license to mine at least 30 square kilometers of seabed per year to recover 1.5 million tons of phosphate nodules from the Chatham Rise, east of Christchurch.<sup>115</sup> This was the

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109. Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 pts 1, 4 (N.Z.).

110. *Id.* at § 20.

111. For an overview of the New Zealand EPA structure, and specifically the current activity in the New Zealand EEZ, see *EEZ Marine Activities*, ENVIRONMENTAL PROTECTION AGENCY, <https://www.epa.govt.nz/industry-areas/eez-marine-activities/ongoing-activity-or-activity-about-to-commence-in-the-eez/marine-scientific-research-prospecting-and-exploration/> (last visited Nov. 20, 2020).

112. See *EEZ Marine Activities*, ENVIRONMENTAL PROTECTION AGENCY, <https://www.epa.govt.nz/industry-areas/eez-marine-activities/about-the-exclusive-economic-zone-and-continental-shelf/> (last visited Nov. 20, 2020).

113. See *Our Role In New Zealand's Exclusive Economic Zone*, ENVIRONMENTAL PROTECTION AGENCY, <https://www.epa.govt.nz/assets/Uploads/Documents-/Documents/Marine-Activities-EEZ/Guidance/EPAs-role-in-EEZ.pdf> (last visited Nov. 20, 2020).

114. Richard Johnson, Manager of EEZ Applications, New Zealand EPA, Presentation at Vanuatu's First National Deep Sea Minerals Policy Consultation (Oct. 7-9, 2014) (notes on file with the author).

115. See Environmental Protection Authority, *Decision on Marine Consent Application: Chatham Rock Phosphate Limited*, NEW ZEALAND GOVERNMENT (2015), <https://www.epa.govt.nz/assets/Uploads/Documents/Marine-Activities-EEZ/Activities/990a6509eb/CRP-Decision->

third application for marine mining received by New Zealand's EPA. One of those applications was granted, and the other was denied.<sup>116</sup> The Chatham Rock Phosphate decision was notable because, in connection with its refusal to grant a license, the EPA issued strong statements about its role in protecting the marine environment from potentially degrading mining activity. In particular, it noted that "the DMC [Decision-Making Committee] found that the destructive effects of the extraction process, coupled with the potentially significant impact of the deposition of sediment on areas adjacent to the mining blocks and on the wider marine ecosystem, could not be mitigated by any set of conditions of adaptive management regime that might reasonably be imposed."<sup>117</sup>

The comprehensive regulatory structures established by New Zealand's existing mining legislation involve a balance between ecological management and sustainable growth, a consultation process for licensing, and the inclusion of best environmental practices, effectively meeting three out of the four suggested requirements for seabed mining governance. Thus, they are able to provide a model to which other countries in need of advanced regulation can look for guidance when reconciling more dated, land-based mining legislation with the needs of seabed mining. Similarly, these regulatory structures can be instructive in designing strong contracts where legislation may be lacking.

### C. *Governments Transitioning to Robust Regulatory and Administrative Structures*

In addition to countries already possessing mining legislation, the lucrative potential of seabed mining has prompted the Cook Islands, a country with very little previous experience with land-based mining, to develop a relatively comprehensive legislative framework in order to address seabed mining as a new source of national revenue. It is estimated that the Cook Islands' two million square kilometer EEZ may contain between fifty million<sup>118</sup> and ten billion<sup>119</sup> tons of manganese nodules. The expected net gain from the extraction of these resources could rise into the tens of billions of dollars.<sup>120</sup> The country established a Seabed Minerals Authority in 2012.<sup>121</sup>

EEZ000006.pdf. *See also*, *EPA Refuses Marine Consent to Chatham Rock*, DREDGING TODAY (Feb. 11, 2015), <https://www.dredgingtoday.com/2015/02/11/epa-refuses-marine-consent-to-chatham-rock/>.

116. *See* Duncan Currie and David Bullock, THE TRANS-TASMAN RESOURCES COURT OF APPEAL JUDGMENT: A SUMMARY AND ITS IMPLICATIONS, 2 (April 2020).

117. Jamie Morton, *EPA Rejects Second Seabed Mining Bid*, NZ HERALD, (Feb. 10, 2015) <https://www.nzherald.co.nz/nz/epa-rejects-second-seabed-mining-bid/YL7CZUWJXBBNQM3MJAQQKYRA/> (quoting Sarah Gardener, the New Zealand General Manager for Applications and Assessment.)

118. COOK ISLANDS COST BENEFIT ANALYSIS OF DEEP SEA MINING. *See also* CARDNO, AN ASSESSMENT OF THE COSTS AND BENEFITS OF MINING DEEP-SEA MINERALS IN THE PACIFIC ISLAND REGION: DEEP-SEA MINING COST-BENEFIT ANALYSIS, at 4.4.1 (2016), <https://static1.squarespace.com/static/5cca30fab2cf793ec6d94096/t/5d9d23f4903eb63f750437fc/1570580036946/A+2016+Assessment+of+the+Costs+and+Benefits+of+Mining+Deep+Sea+Minerals.pdf>.

119. Rupert Neate, *Seabed Mining Could Earn Cook Islands 'Tens of Billions of Dollars.'* THE GUARDIAN (Aug. 5, 2013), <http://www.theguardian.com/business/2013/aug/05/seabed-mining-cook-islands-billions>.

120. *Id.* *But see* Cardno, *supra* note 118.

121. *Home*, COOK ISLANDS SEABED MINERALS AUTHORITY, <http://www.seabedmineralsauthority.gov.ck/>. *See also* Michael Petterson and Akuila Tawake, *The Cook Islands (South Pacific)*

In the face of this potential, the Cook Islands quickly enacted its first Seabed Minerals Act in 2009. Ten years later, in 2019, after drafting a bill with assistance from the New Zealand Parliamentary Counsel and advice from the Secretariat of the Pacific, the Cook Islands government approved an updated Seabed Minerals Act in order to move forward with the issuance of exploratory mining licenses in its EEZ.<sup>122</sup>

Various mechanisms of the legislation (CISMA 2019) meet some of the core objectives for effective seabed governance identified throughout the Article,<sup>123</sup> and may be able to serve as a starting point for a blueprint for other Pacific Island nations should seabed mining proliferate in the region. However, if there are regulatory gaps, either because a given country has not yet developed robust legislation or because the legislation in place leaves the country under-protected, other means, such as contracts or license agreements, will be necessary to fill them.

The primary purpose of the introduction of CISMA 2019 is to create a new source of national revenue, and the structure of the Act reflects that goal. Since the Act does not cover commercial mining and seabed mining in the Cook Islands EEZ, such activity must be done in partnership with the government. Part Six of CISMA 2019 asserts that the holder of a mining license is required to pay prescribed fees, customs duties and taxes in accordance with Cook Islands law and royalties in accordance with the 2013 Seabed Minerals (Royalties) Regulations.<sup>124</sup> Furthermore, CISMA 2019 outlines the government's intention to create a sovereign wealth fund that will distribute royalties and all revenue excluding trade (e.g. license fees) to Cook Islands citizens, thereby boosting household incomes.<sup>125</sup> However, these financial arrangements may work better in theory than in practice, should seabed mining in the EEZ prove lucrative. Under the 2013 Regulations, title holders are required to pay royalties of only three percent,<sup>126</sup> and this rule has not been updated in CISMA 2019.<sup>127</sup> Thus, it may be in the best interest of the Cook Islands government to consider increasing royalty payments in order to ensure that the Cook Islands receives a substantial share of the revenue from seabed mining.

Part Two of the Act establishes a national Seabed Minerals Authority, and clearly delegates the duties, powers and responsibilities of that authority, which include publishing annual reports updating the public on the progress of Cook

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*Experience in Governance of Seabed Manganese Nodule Mining*, 167 OCEAN & COASTAL MANAGEMENT 1 (2018).

122. The bill was passed in June 2019. See Seabed Minerals Act 2019 (C.I.), <https://static1.squarespace.com/static/5cca30fab2cf793ec6d94096/t/5d3f683993ea3f0001b7379c/1564436729995/Seabed+Minerals+Act+2019>; *Cook Islands Government Consulting on New Seabed Mining Bill*, RADIO NEW ZEALAND (Dec. 29, 2018), <https://www.rnz.co.nz/international/pacific-news/379172/cook-islands-govt-consulting-on-new-seabed-mining-bill>.

123. See *supra* text accompanying notes 49-55.

124. Seabed Minerals Act, *supra* note 122, at pt 6 § 98.

125. *Id.* at § 100.

126. Seabed Minerals (Royalties) Regulations 2013, s 4 subs 1 (C.I.).

127. To better understand the royalty structure and the annual revenue potential for seabed mining in the Cook Islands, an elaboration of the Cook Islands tax law would be necessary, but that is beyond the scope of this Article.

Islands seabed mining.<sup>128</sup> Part Two also creates a licensing panel meant to advise on the granting and revocation of seabed mining licenses, the operating details of which are outlined in Part Four of CISMA 2019.<sup>129</sup> The diversity of the licensing panel, created with an exhaustive list of who may be considered for membership as well as the necessary qualifications they must possess, and the comprehensive nature of its vetting process may be key to establishing its credibility and is one aspect of CISMA 2019 that other Pacific countries may seek to replicate.<sup>130</sup>

The ocean and marine life are central to Cook Islands indigenous cultural identity.<sup>131</sup> CISMA 2019 makes its purpose clear: it is to “provide for interaction between this Act and national law relating to environmental impact assessment consents, project permits and environmental management.”<sup>132</sup> Further, applicants for seabed mining licenses are required to comply with both the 2003 Environment Act and the 2017 Marae Moana Act.<sup>133</sup> The Marae Moana Act designates the entirety of the Cook Islands EEZ as a protected area. Marae Moana was created with the intention to “protect and conserve the ecological, biodiversity and heritage values of the Cook Islands marine environment...[and to] provide an integrated decision-making and management framework to coordinate the work of relevant agencies so as to effectively balance marine conservation with ecologically sustainable use of the marine environment and resources.”<sup>134</sup>

Still, the effectiveness of the CISMA 2019/Marae Moana regulatory structure lies in its ability to enforce environmental protections. CISMA 2019 includes a section on enforcement powers in which it asserts that both civil and criminal punishment may occur with the full weight of the Cook Islands government should the Act be violated,<sup>135</sup> and it is key that these assertions are not merely superficial; ecologically sustainable seabed mining will not be possible in the Cook Islands or any other Pacific country without legitimate enforcement of environmental laws.

#### *D. Governments with Less-Developed Regulatory and Administrative Structures*

Several countries with less developed legal structures have come under intensifying pressure to provide exploration and/or exploitation licenses for seabed minerals under their sovereign control. Island nations in the South Pacific are attracting particularly intense attention, and the result is that more than “300

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128. Seabed Minerals Act, *supra* note 122, at pt 2 subpt 1 ss 12-20.

129. *Id.* at subpt 2.

130. *Id.* at s 25.

131. Francie Diep, *How a Small Island Nation is Working to Protect its Ocean in the Face of Climate Change*, PACIFIC STANDARD (July 21, 2017), <https://psmag.com/environment/cook-islands-massive-marine-preserve>.

132. Seabed Minerals Act, *supra* note 122, at pt 1 s 3 subs 1.

133. *Id.* at pt 5 s 91.

134. Marae Moana Act, 2017, pt 1 s 33 subs 1-2a (C.I.).

135. *Id.* at pt 7.

exploration licenses have been granted in Pacific Island countries.”<sup>136</sup> To alleviate the problems caused by insufficient or non-existent legal, and regulatory structures, coupled with the relative lack of legal, technical and administrative capacity in a number of Pacific Island nations, the European Union, together with the Secretariat of the Pacific Community (SPC) initiated the SPC-EU EDF 10 Deep Sea Minerals Project (SPC-DSM Project). A central goal of the project was:

. . . to support informed and careful governance of any deep sea mining activities in accordance with international law, with particular attention to the protection of the marine environment and securing equitable financial arrangements for Pacific Island countries and their people.<sup>137</sup>

To this end, the SPC has been working in 15 countries<sup>138</sup> to develop regional legislative and regulatory frameworks, as well as to formulate national policy, legislation and regulation for seabed mining in each of its countries of operation.<sup>139</sup>

Working with SPC, these countries are in the process of adopting domestic structures to address seabed mining. The SPC points to the novelty of these institutional innovations:

Very few countries in the world have taken these vital legal steps. The Pacific ACP states<sup>140</sup> are leading the way. It is anticipated that this Regional Legislative and Regulatory Framework (RLRF) . . . will prove to be an invaluable roadmap for Pacific Island states in tackling this new and complex area. The RLRF seeks to give policy-makers, lawyers and technical agencies the best information currently available to enable informed decision-making for the long-term benefit of Pacific Island communities and future generations.<sup>141</sup>

In addition to these activities, the SPC-DSM Project aims to facilitate seabed mining for each country in which it operates. Indeed, much of its work is geared toward generating interest among investors, governments, and citizens in seabed mining. This can be seen by taking stock of the contents of its informational reports and brochures, which primarily contain information about mineral deposits and mining, and far less information about regulatory structure and protective legislation.<sup>142</sup>

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136. *Vanuatu Prepares for Deep Sea Mining*, THE MARITIME EXECUTIVE (Oct. 23, 2014), <http://www.maritime-executive.com/article/Vanuatu-Prepares-for-Deep-Sea-Mining-2014-10-23>.

137. Secretariat of the Pacific Community, *European Union Deep Sea Minerals Project (SPC-EU DSM Project)*, UN SUSTAINABLE DEVELOPMENT GOALS PARTNERSHIPS PLATFORM, <https://sustainabledevelopment.un.org/partnership/?p=7645> (last visited Feb. 15, 2020).

138. The countries in which the SPC-DSM Project is working are: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu, and Vanuatu. *See About the SPC-EU Deep Sea Minerals Project*, SPC-EU DEEP SEA MINERALS PROJECT, <https://dsm.gsd.spc.int/> (last visited Nov. 1, 2020).

139. *Id.*

140. The “Pacific ACP states” refers to the African, Caribbean, and Pacific Group of States. *See ORGANIZATION OF AFRICAN, CARIBBEAN AND PACIFIC STATES*, <http://www.acp.int/> (last visited Nov. 1, 2020).

141. SPC-EU EDF10 Deep Sea Minerals Project, *Pacific-ACP States Regional Legislative and Regulatory Framework for Deep Sea Minerals Exploration and Exploitation*, iii (July 2012), <https://www.smenet.org/docs/public/FinalDeepSeaMineralsProjectReport.pdf>.

142. *Brochures*, SPC-EU DEEP SEA MINERALS PROJECT, <http://gsd.spc.int/dsm/index.php/resources> (last visited Feb. 15, 2020).

The seabed mining facilitation and capacitation approach of the SPC-DSM Project has come under fire from local and regional NGOs and civil society organizations. A collaboration between two of the more active organizations on the issue of seabed mining provides a legal analysis of the SPC-DSM Project and, more specifically, its Regional Legislative and Regulatory Framework (RLRF). Its summary, which is worth quoting at some length, states:

Overall, the RLRF paints a positive picture of DSM—one that arguably prioritizes creating a climate favorable to industry and DSM operators over the economic and cultural rights of indigenous peoples. It advises States to incentivize investors by providing an environment that fosters investment, recommending that States provide predictable and stable governance, reasonable taxation, and legislation that takes into account corporate risks and investments. It similarly emphasizes the purported benefits of DSM, while downplaying the range of adverse impacts (actual and potential) associated with DSM. By stating that any impacts are ‘extremely minimal’ or, alternatively, that DSM-related activities have ‘almost no impact,’ the Framework minimizes the importance of State adherence to the precautionary principle . . . .

Along a similar vein, the RLRF relegates the concerns and interests of indigenous peoples to the sidelines, largely ignoring their rights to land, culture, and resources . . . . Historically, indigenous peoples worldwide have experienced displacement, loss of land, depletion of means of subsistence, negative health impacts, and other cultural and social deprivations as a consequence of these activities. Such harms are likely to be replicated in the case of DSM, particularly if regulatory frameworks lacking comprehensive protections . . . are adopted.<sup>143</sup>

This section has detailed the importance of national regulatory structures to the current and future regulation of seabed mining, and has provided a framework for understanding the broad spectrum of legal capacity and preparedness within the constitutional and legislative structures of countries contemplating seabed mining within their jurisdiction. In the next Part, this Article will focus on the experience of Vanuatu, as it has become a focus of seabed mining companies and a location of interest for the SPC-DSM Project.

### III. VANUATU AND THE DISCOVERY OF EXPLORATION LICENSES

#### A. *Vanuatu’s Marine Resources and Regulatory Structure*

The Republic of Vanuatu is one of the poorest countries in the world. Indeed, it regularly appears near the bottom of the World Bank’s GDP index. In 2018, Vanuatu ranked 192<sup>nd</sup> of 204 ranked countries by GDP.<sup>144</sup> On the 2019 Human Development Index, Vanuatu is ranked 141 of 189 ranked countries.<sup>145</sup> Nonetheless, Vanuatu has performed an intensive self-study on the level of overall life satisfaction of its population and found notably high self-assessments of overall satisfaction. Among the key contributors to this phenomenon is ample access to marine resources. Forty-seven percent of Vanuatu citizens live within fifteen minute’s walking distance to the ocean, and eighty-three percent live

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143. BlueOceanLaw in collaboration with Pacific Network on Globalization, *An Assessment of the Secretariat of the Pacific Community Regional Legislative and Regulatory Framework for Deep Sea Minerals Exploration and Exploitation*, 2 (on file with author).

144. GDP Ranking (GDP) Data Catalog, WORLD BANK (2018).

145. United Nations Development Programme, *Human Development Reports*, 2019 HUMAN DEVELOPMENT INDEX RANKING (2019), <http://hdr.undp.org/en/content/2019-human-development-index-ranking>.



within an hour's walk.<sup>146</sup> The self-study reveals a correlation between access to marine resources and happiness.<sup>147</sup>

This self-reported correlation between well-being and access to marine resources amplifies the importance of protecting these resources. This is all the more true for a population that would have very little economic resilience if the marine environment were harmed.

Vanuatu's marine wealth includes resources that are found, harvested or hunted by people with ready access to ocean.<sup>148</sup> People living close to the coasts also exchange resources with people living inland, amplifying their access to land-based resources and contributing to Vanuatu's vital non-monetary, barter economy.<sup>149</sup>

Vanuatu's national territorial waters, EEZ, and continental shelf also contain hidden mineral riches that have the potential to travel through the global monetary economy. In recent years it has become evident that Vanuatu's sovereign seabed contains seafloor massive sulphides, which could contain "significant quantities of copper, gold, zinc, silver, and other commercially viable minerals."<sup>150</sup> The monetary value of these deposits is highly speculative, but recall that it is estimated that the nearby Cook Islands' Continental Shelf may contain "as many as 12 billion tonnes of mineral rich manganese nodules tons of manganese nodules."<sup>151</sup> In the face of this potential, the Cook Islands quickly enacted its first Seabed Minerals Act in 2009, and in 2012 that country established a Seabed Minerals Authority.<sup>152</sup>

The high value placed on both the non-monetized resources on which Ni-Vanuatu people depend for their well-being and the monetizable mineral resources on its sovereign seabed suggests the need for a significant deliberative process over the best uses of Vanuatu's marine territory. If seabed mining is to take place in Vanuatu, it also suggests the imperative for a well-developed regulatory structure that will balance the traditional, central importance of popular access to marine resources and the likely environmental consequences of seabed mining.

Vanuatu, however, has very little experience with land-based mining and thus has a very thin regulatory structure with respect to land-based mining. Even more importantly, until very recently, Vanuatu had absolutely no legal or regulatory structure with respect to seabed mining. The existing Minerals and

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146. VANUATU NATIONAL STATISTICS OFFICE WITH MALVATUMAURI NATIONAL COUNCIL OF CHIEFS, INDICATORS OF WELL-BEING FOR MELANESIA: VANUATU PILOT STUDY REPORT, 33 (2012), <http://www.christensenfund.org/wp-content/uploads/2012/11/Alternative-Indicators-Vanuatu.pdf>.

147. *Id.* at 34.

148. According to one presenter at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference, 77% of people in Vanuatu live in coastal areas and are involved in fishing of some form. Malcolm Clark, Presentation at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference (October 8, 2014) (notes on file with author).

149. VANUATU NATIONAL STATISTICS OFFICE WITH MALVATUMAURI NATIONAL COUNCIL OF CHIEFS, *supra* note 146, at 32.

150. THE MARITIME EXECUTIVE, *supra* note 136.

151. Cook Islands, Seabed Mineral Authority, *Discover Cook Islands Seabed Minerals*, <https://www.sbma.gov.ck/> (last visited Nov. 9, 2010).

152. Seabed Minerals Act, *supra* note 122.

Mining Act was drafted in 1986 and, as in the Cook Islands, the Act, which contemplates land-based activity, is in the process of being amended to attempt to address seabed prospecting and mining.<sup>153</sup> At the time Vanuatu was initiating its amendment process, the SPC EU-DSM Project had provided Vanuatu's Department of Geology and Mines with a model Deep Sea Minerals Draft Policy.<sup>154</sup> These documents, which were being drafted and amended very rapidly in Vanuatu, are as novel and unfamiliar as the simultaneous pressure from seabed mining companies to extend licenses to explore and prospect Vanuatu's sovereign territory and EEZ.

### *B. Prior Licenses*

On June 10, 2013, during his opening address at the Regional Training Workshop on Social Impacts of Deep Sea Mining Activities and Stakeholder Participation in Port Vila, Vanuatu, the country's Minister for Lands and Natural Resources disclosed for the first time that he had recently discovered that, during the previous five years, his predecessor had granted "about 145 licenses for offshore mining exploration and prospecting and another 3 for offshore oil exploration."<sup>155</sup> His announcement was as follows:

When I learnt that this workshop was going to happen, as the Minister responsible I decided to find out what I could about this issue. In undertaking my research, I made a very disconcerting discovery, something that in my five years as a parliamentarian and just over one year (accumulated) as a minister of state I never knew: that in the past five years, the Government of Vanuatu has issued about 145 licenses for offshore mining exploration and prospecting, and another 3 for offshore oil exploration.

By announcing this discovery of mine today, I am also making this information public in Vanuatu for the first time, and I have no doubt that this will be the first time that 99% of the population of this country is aware of this.

Needless to say, these licenses have been issued without any proper national regulatory framework for seabed mining or for scientific research, let alone any proper understanding of what the prospecting process entails and what lies on our seabed—this is, after all, the common situation all our countries find ourselves in when engaging with seabed mineral issues.

What concerns me most, however, is that the government has been proceeding down a path of action without the people it is supposed to represent agreeing to or even knowing about what we are doing.

The Vanuatu participants in this workshop know my reputation well as someone who is in politics to increase the transparency and accountability of government, which to me means being accountable and responsible to the people of this country whom we represent and who pay our salaries with their taxes.<sup>156</sup>

His announcement revealed the disconnect between the purported

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153. REPUBLIC OF VANUATU, THE AMENDMENT OF MINES AND MINERALS ACT, CAP 190 NO. 06 OF 1986 (1986) (proposed amendment).

154. VANUATU DEEP SEA MINERALS DRAFT POLICY (2014) (on file with author).

155. Papua New Guinea Mine Watch, *Vanuatu Minister Calls on Pacific Governments to Respect People's Wishes on Experimental Seabed Mining*, DEEP SEA MINING: OUT OF OUR DEPTH (May 10, 2013) <http://www.deepseaminingoutofourdepth.org/vanuatu-minister-calls-on-pacific-govts-to-respect-peoples-wishes-on-experimental-seabed-mining/>.

156. *Id.*

commitment of companies like Bismarck Mining Corporation, which has stated publicly that they place a high premium on the social license to operate,<sup>157</sup> and the discovery that they had entered into a number of exploration licenses in Vanuatu without any consideration by the population, or even the nation's Parliament.<sup>158</sup>

Only after the Minister of Lands and Natural Resources had discovered the existing licenses did the Ni-Vanuatu population learn that the government had opened Vanuatu to this activity. In July 2014, the editor of one of Vanuatu's national newspapers revealed to this author that he was not aware of the licenses. Fieldwork by the author at the time reinforced that only a limited number of individuals, primarily those in government or working for national NGOs, had any knowledge of the exploration licenses. Among those groups that knew of the licenses, there was notable opposition. For example, the President of the Vanuatu National Council of Women stated:

As President of the Vanuatu National Council of Women (VNCW) who make up 49% of the population of this country ... our women in Vanuatu do not want to see deep sea mining to operate in and around Vanuatu islands due to environmental threats. ... The women of Vanuatu are joining in and supporting their sisters from PNG and Solomon Islands who also do not agree to be exposed to some irreversible catastrophic changes and left with a poisoned and polluted Pacific Ocean without fish. Hon. Minister, we look forward to your positive intervention in this regard in ensuring a safe and sustainable environment for the future of this Nation.<sup>159</sup>

### *C. Consultation Process*

The Minister of Lands and Natural Resources has not taken a position on the licenses, or on their renewals. Rather, he has taken the view that his responsibility as a public servant is to assure that any position he takes on the question of seabed mining is informed by his constituents. To that end, in October 2014, the Minister initiated a national consultation process that was designed to include members of Parliament, the Council of Chiefs, regional and national NGOs, civil society associations, and the public at large. This consultation process was initiated during a three-day conference in the country's capital city, Port Vila, and the intention of the Minister was to continue the consultation process on many of Vanuatu's eighty-three islands. This is consistent with the Minister's view that the only way to legitimately proceed with seabed exploration and mining, if it is to continue in Vanuatu, is with the free, prior, and informed consent of the country's people.

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157. Harvey Cook, Tim McConachy, and Sophie Egden, Bismarck Mining Corporation (Vanuatu) Limited SOPAC Presentation, 18, <http://dsm.gsd.spc.int/public/files/meetings/Wednesday%2012th/Session%2011Neptune%20Vanuatu%20SOPAC%20Presentation.pdf> (last visited Jan. 28, 2020).

158. Papua New Guinea Mine Watch, *supra* note 155.

159. *Id.*

#### D. *Drafting the Model Contract*

Following the consultation process, the author drafted a Model Contract<sup>160</sup> with the intention to include the promises and expectations expressed by the company and the Ni-Vanuatu people during the consultation, and to establish the means for effectively mitigating and accounting for the possible risks presented by such an operation. The Model Contract totals 77 pages and includes terms addressing the expectations and obligations for each step of the mining process, including the determination of initial feasibility, the issuance (and possible relinquishment) of a prospecting license, the management of ongoing operations, and the distribution of benefits and profits. Importantly, it also includes extensive terms regarding transparency, accountability, and liability for any harms caused. The Model Contract's guiding principles and their embodiment in its concrete terms provide useful examples of the important role contracts can play in promoting equitable outcomes and mitigating harms for seabed mining operations and will be discussed at length in the following sections.

#### IV. GOVERNANCE TOOLS IN THE ABSENCE OF STRONG REGULATORY STRUCTURE

In locations or contexts with strong constitutional, statutory, regulatory, and administrative structures, private transactions are largely supported by that legal infrastructure. But what happens in the context of novel activity like seabed mining, in which the likely benefits and harms are still largely unknown? And, more importantly, how can the law balance and provide structure for the competing interests of commercial gain on the one hand, and environmental and human well-being concerns on the other, in locations like Vanuatu, where the experience and legal infrastructure that exists in places like the United States, Australia and New Zealand is largely absent?

In contexts such as these, it is imperative to appreciate the importance of the contract between the government and the companies seeking to explore, prospect, and exploit seabed minerals as a contract between the parties which must balance the commercial and public interest, assuring that known and unknown benefits and risks are allocated appropriately during the term of the activity and that conflicts between the parties have a reasonable likelihood of being solved promptly and impartially.

In the mining sector, the license agreement between the government and the mining company provides the exclusive right to explore or extract minerals

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160. Christiana Ochoa, *Model Prospecting License: Republic of Vanuatu* (Mar. 29, 2016) (on file with author). In October 2014, the Minister of Mines and Natural Resources requested advice regarding necessary changes to the existing license agreements. The Model Contract relied on stakeholder representations made during the consultation process and extensive research to draw on an array of best practices in the mining sector with respect to the elements discussed in Section IV.A. The document was intended as a means to disrupt the default dependence on initial drafts typically provided by companies, which favor companies either by means of ambiguity or by creating explicitly unfavorable terms for governments. The document was drafted with the purpose of asserting best practices and thus re-balancing negotiations between the government of Vanuatu and companies seeking prospecting licenses for Vanuatu's seabed minerals. The Model Contract is available by request for review and use by other countries.

within a determined area of land in exchange for a set of promises and obligations, including payment of royalties and taxes, environmental assessments and remediation, social obligations and so on. In locations like South Africa or the Canadian provinces of British Columbia and Ontario, with significant experience with mining and where the basic statutory and regulatory framework is relatively strong, companies and governments tend to rely more on this public legal infrastructure and less on contracts. In locations where the mining sector is just developing, it is more common to see comprehensive contracts that attempt to fill the gaps left open by an inadequately developed legal environment.

Unfortunately, the substantive provisions of Vanuatu's initial license agreements were woefully bare—each consisting of less than 450 words.<sup>161</sup> In combination with the insufficiency of Vanuatu's statutory and regulatory structure, these license agreements amount to a license to nearly absolute impunity for the mining companies that have signed these agreements. The licenses were simply under-suited to the importance of this novel activity. For this reason, the Minister of Lands and Natural Resources sought outside assistance in creating a new model license agreement.

#### *A. The Role of Contracts*

A collaborative publication between a number of organizations working on sustainable development, legal best practices, and natural resource governance provides a useful aid to considering both the importance of contracts in such situations and also provides insights into strong contract clauses and policy considerations.<sup>162</sup> The guide usefully summarizes both the hierarchy of law in which, ideally, national constitutions provide the substrate on which all stable legal structures depend, followed by the laws and then the regulations within a country. In many settings, these legal structures provide the largest portion of the regulatory structure governing natural resource extraction activity. In a significant number of cases, however, “contracts are specifically designed to take precedence over domestic laws (though sometimes the laws will not allow this) . . . . However, the more comprehensive the domestic framework, the stronger the tendency is for domestic law to take precedence.”<sup>163</sup> As they further explain, “in a relatively comprehensive legal environment, a contract could be extremely short. A contract in one country may be 250 pages and only 15 pages in another.” This concept is captured by the Figure 1 below.<sup>164</sup>

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161. Republic of Vanuatu, Prospecting License, PL1713, Renewal 1, Fortuna 1 Tafea Province, Nautilus Minerals Offshore 16 Limited (May 2014) (on file with author).

162. NATURAL RESOURCE GOVERNANCE INSTITUTE, *supra* note 64, at 15.

163. *Id.*

164. Figure 1 appears in NATURAL RESOURCE GOVERNANCE INSTITUTE, *supra* note 64, at 16.

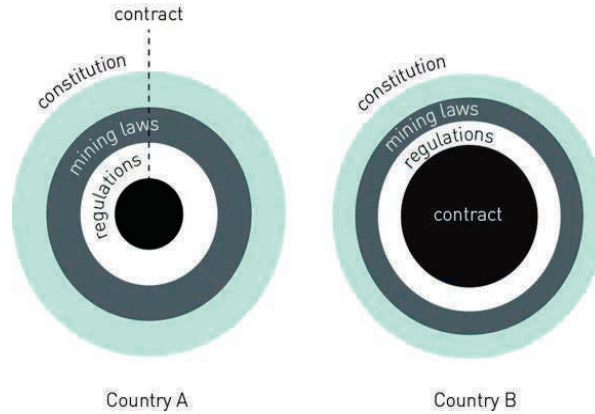


Figure 1

As detailed herein, any license agreement between a government and interested seabed mining companies will need to accomplish four objectives.

First, it will need to do what any good long-term contract should do: create a stable and predictable set of rights and obligations between the parties and establish reasonable mechanisms for objective dispute resolution. In the context of experimental activity, such as seabed mining, which to date has never been undertaken, these terms are of vital importance. While many of these terms may normally be captured by domestic constitutions, mining laws, and regulations, the absence of these basic structures demands heightened attention to the basic contract terms.

Second, it will need to fully appreciate the valuable contributions of each party to the contract as well as the risks each party is undertaking. While it is true that mining companies may hold the promise of being able to provide the machinery and technological expertise to access the mineral wealth on the seabed, that mineral wealth ultimately belongs to the citizens and governments of each country with jurisdiction over those resources. At the same time, both parties bear substantial risks. Companies will bear responsibility to investors or shareholders who have financed mining activity, while governments bear the risk of environmental catastrophes and poor management of the potential or actual income from mining activity. In other words, both parties play important roles in converting mineral wealth into monetary resources, and both parties bear substantial risks. The contract should reflect this reality and assure that the compensation paid to each party properly reflects the proportional contributions and potential risks each party bears.

The third goal is largely dependent on the second and intimately connected with it: the contract should reflect the intentions, conditions, expectations, and trepidations of local populations. In order to accomplish this, a robust process of free, prior, and informed consultation/consent (FPIC) is necessary, not just to ensure good process. Communities must have the opportunity to object to seabed mining and, if they approve it, to contribute to the substantive terms and conditions of the contract such that the legal rights and obligations created by that document reflect the terms on which the local population consented to mining activity. This third factor is particularly important in light of the parol

evidence rule (in jurisdictions where it is applicable),<sup>165</sup> a common law doctrine which dictates that, when a contract is determined to be completely incorporated (meaning that all of the terms of the agreement are included in the written document) and its terms are unambiguous, no evidence can be presented of prior negotiations in an attempt to dispute or add to the contract terms.<sup>166</sup> Most license agreements will either clearly state that the contract is a full and complete representation of the agreement between the parties or, given the nature of their content are likely to be deemed to be fully integrated contracts, any term, understanding or promise made by either party that is not included in the license agreement will not be enforceable. The result is that any representation made by, for example, the mining companies or experts they hire to provide information during community consultation processes and on which community consent may have hinged, will not be enforceable against the companies if it is not expressly included in the terms of the document.<sup>167</sup>

Finally, the contract must do what the relatively slow statutory innovation process impedes: it must capitalize on its relative nimbleness and flexibility and incorporate state-of-the-art ecology management theory and development theory such that the contract can reflect what statutory, regulatory or administrative approaches will be slower to integrate. The contract is able to and should translate concepts like the precautionary principle, adaptive management and the well-being approach, rather than the growth-based approach to commercial activity. Each of these four objectives will be explored in further detail below.

Before delving into these innovations, it is important to acknowledge their possible impacts on firms' willingness to accept the resulting contract terms, such as a possible "race to the bottom" that favors countries that require less stringent safeguards and less demanding social terms. While such a result cannot be ruled out entirely, the establishment of increased transparency of contract terms as a norm within the mining industry is playing an important role in the adoption of more equitable and mutually beneficial contracts. One of the greatest barriers to equitable outcomes in the mining industry has long been its reliance on the non-disclosure of contract terms. Recent years have seen a change in this approach with the creation of systems of accountability such as the Extractive Industry Transparency Initiative<sup>168</sup> and the work of Oxfam,<sup>169</sup> the International Council on Mining & Metals,<sup>170</sup> and others. When the public is given access to

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165. The parol evidence rule is misleading as it is neither limited to parol (oral) communication, nor is it a procedural rule of evidence. Rather, the rule is a facet of substantive contract law that limits the admissibility of evidence in contract disputes beyond the "four corners" of the contract itself. See E. Allen Farnsworth, *CONTRACTS* 427-28 (3d ed. 1999).

166. *Id.* at 431.

167. *Id.*

168. See THE EXTRACTIVE INDUSTRIES TRANSPARENCY INITIATIVE, <https://eiti.org/> (last visited Nov. 1, 2020).

169. See *Contract Disclosure Survey*, OXFAM, <https://www.oxfam.org/en/research/contract-disclosure-survey-2018> (last visited Nov. 1, 2020) (stating that "contract disclosure in the oil, gas, and mining sector is an emerging global norm.").

170. See *Contract Transparency*, INTERNATIONAL COUNCIL ON MINING & METALS, <https://www.icmm.com/en-gb/society-and-the-economy/governance-and-transparency/contract-transparency> (last visited Nov. 1, 2020).

the terms of mining contracts, it has been shown that companies are more likely to agree to more equitable terms, and these systems of accountability go a long way to counter the impacts of imbalanced bargaining power in the industry.

The importance of transparency extends beyond the contract terms and reaches into performance on the contract as well. In locations with thin governance capacity, the administrative infrastructure to monitor compliance may also be lacking. The contract terms must anticipate this possibility by building into the contract the full cost of governments' monitoring and managing compliance into the terms or, alternatively, make explicit the requirement of transparent and frequent reporting on the part of the company.

Additionally, because of the formidable risks to the economic and cultural sovereignty and well-being of impacted communities, development in this industry should rightly be based on certain minimal standards of care. If countries are to consider allowing for companies to engage in these activities within their EEZ's, consent should be conditional on a commitment to practices and systems of accountability in line with the principles discussed below.

## *B. Coming to Terms*

### *1. First Objective: Create a Stable Relationship*

Long-term commercial contracts regarding high-risk activity must provide a stable and predictable set of rights and obligations for each of the parties thereto. The mining companies engaged with the Pacific Islands have background in land-based mining and in sea-based oil exploration. In both of those sectors, ample history and experience means that there are model contracts from which useful language can provide familiar and tested provisions for the allocation of the basic rights and obligations of the parties. In addition to the International Bar Association's Model Mining Development Agreement, recent work by a number of organizations has made natural resource contracts in the petroleum and mining sector available to the public at large.<sup>171</sup> This is a very useful step in an industry that has been notorious for secret company-government agreements.<sup>172</sup> The model provided by the MMDA and the examples in newly available repositories of government-company agreements in the extractive industries make it much more likely that new contracts can follow best-practices with respect to the basic elements common in mining contracts.

This is not enough, however. In order to attempt to provide the necessary protections for this activity, the most protective existing model contracts, statutes, and regulations provide much needed material.<sup>173</sup> The above cited

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171. DIRECTORY OF PETROLEUM AND MINERAL CONTRACTS, <http://www.resourcecontracts.org/> (last visited Jan. 28, 2020).

172. OPEN CONTRACTING PARTNERSHIP, <http://www.open-contracting.org/> (last visited Jan 28, 2020). See generally Peter Rosenblum & Susan Maples, *Contracts Confidential: Ending Secret Deals in the Extractive Industries*, REVENUE WATCH INSTITUTE (2009) <https://resourcegovernance.org/sites/default/files/RWI-Contracts-Confidential.pdf> (arguing for more transparency in extractive industry contracts).

173. The argument here is not that contracts on seabed mining will prevent all such harms. Land-based mining, whether structured through legislation and licenses or through contracts, provides ample



statutes and regulations in the United States, Australia, and New Zealand provide necessary language and also very important information with respect to the cautious approach each of those countries is taking on seabed mining. Finally, the International Seabed Authority's regulations on each of the three main types of seabed mineral types and their model exploration contract terms provide useful language that must form a baseline for allocating rights and responsibilities as well as benefits and risks.<sup>174</sup> Some of the more notable elements of these domestic and international regulations will be discussed below, accompanied by examples from the Model Contract drafted for Vanuatu; illustrating how these regulatory goals can be incorporated into a contractual agreement in the absence of strong regulatory systems with the aim of creating a stable and predictable set of rights and obligations between the parties, and establishing reasonable mechanisms for objective dispute resolution.

In the absence of sufficient regulation, transparent contracts play a vital role in creating a stable relationship. Three regulatory elements that contribute to these goals will be discussed in this section: (1) the right of the country or regulating organization to proactively assess the potential harm that might occur and the obligation of the company to aid in that process; (2) determinations of the ability of the company to truly live up to its promises regarding the implementation of the proposed project and any precautionary or remedial measures it commits to take; and (3) specific provisions detailing the amount of liability the company will face and the appropriate remedy for harm caused. This section will briefly touch on these three core regulatory functions as expressed by the ISA and the governments of New Zealand, Australia, and the United States.

*a. Environmental and Social Impact Assessments and Monitoring*

The right of the country to be able to consider the likely impacts of a project before it begins, as well as to monitor the actual social and environmental impacts as the project progresses, are central to a successful regulatory regime for mining operations.<sup>175</sup> And, accompanying that right should be the obligation of the company to submit environmental assessments and plans to aide in the collection of the data necessary for such determinations. The International Seabed Authority provides examples of this set of rights and obligations in all

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evidence of environmental and social harms associated with that activity. Rather, the contention here is that, in the absence of adequate legislation and regulation, contracts provide the best available mechanism for the creation of duties and remedies with respect to such harms. Taken in combination with the recent push toward contract transparency, contracts have the potential—in comparison to prior historical moments—of increasing the likelihood of creating “robust, stable, and fair deals.” See *What's the Deal? Evolving Practices in Contract Transparency*, Extractive Industries Transparency Initiative (June 2018), <https://eiti.org/event/contract-transparency>.

174. It is useful to note that New Zealand and Australia are both members of the ISA, and, as mentioned above, the United States is not. See *Member States*, INTERNATIONAL SEABED AUTHORITY, <https://www.isa.org.jm/member-states/U> (last visited Nov. 1, 2020).

175. See generally, Malcolm Clark, et. al., *Environmental Impact Assessments for Deep-Sea Mining: Can We Improve their Future Effectiveness?*, 114 MARINE POLICY 103363 (2020) <https://www.sciencedirect.com/science/article/pii/S0308597X18307309>.

three of the major seabed mining regulations, requiring that an environmental impact assessment be made and submitted before the start of the projects.<sup>176</sup> Additional regulations dictate that after establishing the environmental baselines, the contractor shall “cooperate with the Authority and the sponsoring State or States in the establishment and implementation of such monitoring programme.”<sup>177</sup> New Zealand’s Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act of 2012 (EEZ Act), states as one of its purposes: “safeguarding the life-supporting capacity of the environment.”<sup>178</sup> Section 39 of the Act details the requirements of the Impact Assessment, presenting one of the more comprehensive examples of such regulatory requirements. In completing the Impact Assessment, the Act requires that the company:

- (a) describe the activity (or activities) for which consent is sought; and (b) describe the current state of the area where it is proposed that the activity will be undertaken and the environment surrounding the area; and (c) identify persons whose existing interests are likely to be adversely affected by the activity; and (d) identify the effects of the activity on the environment and existing interests (including cumulative effects and effects that may occur in New Zealand or in the sea above or beyond the continental shelf beyond the outer limits of the exclusive economic zone); and (e) identify the effects of the activity on the biological diversity and integrity of marine species, ecosystems, and processes; and (f) identify the effects of the activity on rare and vulnerable ecosystems and habitats of threatened species; and (g) describe any consultation undertaken with persons described in paragraph (c) and specify those persons who have given written approval to the activity; and (h) include copies of any written approvals to the activity; and (i) specify any possible alternative locations for, or methods for undertaking, the activity that may avoid, remedy, or mitigate any adverse effects; and (j) specify the measures that could be taken to avoid, remedy, or mitigate the adverse effects identified (including measures that the applicant intends to take).<sup>179</sup>

Australia’s Deep Sea Minerals Act implements a condition on exploration licenses “requiring the holder to take steps to protect the environment of the licence area, including conditions relating to: (i) protecting wildlife or (ii) minimising the effect on the environment of the licence area and the area.”<sup>180</sup> In that same vein, the U.S. Code chapter on deep seabed hard mineral resources includes provisions, allowing that:

[a]fter issuance or transfer of any license...the Administrator, after consultation with interested agencies and the licensee...may modify any term, condition, or restriction in such license [for the following purposes] . . . . If relevant data and other information (including, but not limited to, data resulting from exploration...activities under the license) indicate that modification is required to protect the quality of the

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176. See Regulation 18, *Data and Information To Be Submitted for Approval of the Plan of Work for Exploration*, INTERNATIONAL SEABED AUTHORITY 13, [https://isa.org.jm/files/files/documents/isba-19c-17\\_0.pdf](https://isa.org.jm/files/files/documents/isba-19c-17_0.pdf) (last visited Nov. 9, 2020).

177. Regulation 32, *Environmental Baselines and Monitoring*, INTERNATIONAL SEABED AUTHORITY 20 [https://isa.org.jm/files/files/documents/isba-19c-17\\_0.pdf](https://isa.org.jm/files/files/documents/isba-19c-17_0.pdf) (last visited Nov. 9, 2020).

178. Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act, 10(1) (2012) (N.Z.), <http://www.legislation.govt.nz/act/public/2012/0072/latest/DLM3956190.html>.

179. *Id.* at 39(1).

180. Offshore Minerals Act, 1994 (Act. No. 28/1994) (Austl.).

environment or to promote the safety of life and property at sea.<sup>181</sup>

The Model Contract reflects the same regulatory goals, adopting an intensive system for environmental impact assessments and continual monitoring<sup>182</sup> by defining and detailing processes for a Preliminary Impact Assessment (PEIA), Preliminary Environmental Management Plan (PEMP) and a Preliminary Social Management Plan (PSIA).<sup>183</sup>

The obligatory assessment and plans include specific benchmarks and reporting requirements, both automatic and conditional, including that these preliminary reports and the management plan be submitted to the Ministry of Lands and Natural Resources at least 90 days prior to the Effective Date.<sup>184</sup> It also requires that the PEIA and the PSIA be prepared by “an internationally recognized independent consultant (or consultants), not affiliated with the Company or any of its principle direct or indirect shareholders . . . .”<sup>185</sup> The Model Contract goes into specific requirements for each of the plans and reports including ensuring that the mechanism, in the case of the PEIA will “employ best practices in order to, at a minimum, identify pre-existing environmental conditions (a baseline environmental assessment) and set forth the potential adverse impact of the Prospecting activity and shall take into account all activities which will be undertaken by the Company in connection with this Agreement.”<sup>186</sup> In tandem with that, the PEMP is required to:

set forth a reasonable estimate (provided by an environmental consultant not in the employ of the Company) of the full costs of environmental remediation from the planned Prospecting and Operations, as well as the full costs of environmental remediation and restoration that may be required in the event of potential accidents and unforeseen events.<sup>187</sup>

Such explicit obligations provide the Model Contract with important baselines for enforcement of Company promises to clean up any environmental harm, providing not only abstract commitments to taking responsibility but also concrete numbers and an acknowledgement of the extent of harm that could occur as a result of the project.<sup>188</sup> As environmental harm is of course not the

181. 30 US § 26.1415c(1)(B) (1980).

182. See Ochoa, *supra* note 160, at sections 4.6, 4.8, 5.4, and 13.

183. *Id.* at 15-18.

184. *Id.* at 15.

185. *Id.*

186. *Id.*

187. *Id.*

188. Provisions such as these are especially important when mining company representatives make statements that would understandably cause communities to believe the harm to the environment might be minimal. For example, during Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference, company representatives made statements that the mineral-rich chimneys might be renewable. Harvey Cook stated that in some areas chimneys can grow quite quickly, such that chimneys could be harvested now and then re-grown and recollected in 50-100 years, and that this process “might be like forestation.” See Cook, *supra* note 17. Similarly, Allison Spalding of the SPC/DSM Project has stated that drill holes in chimneys might cause a reaction inside the chimneys such that the companies could “grow the chimneys, even of very high quality.” Spalding also stated that, while chimneys have hundreds of species living around them, they may be “resilient to disturbances, sometimes in as little as five years.” She also said that she was not promising that every site would recover in just five years. See Allison Spalding, Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference (October 7, 2014) (notes on file with author).

only risk undertaken in these projects, both ISA regulations<sup>189</sup> and the Model Contract<sup>190</sup> require that any archeological finds are immediately reported to the relevant organization.

*b. Determining the Company's Capacity to Fulfill Obligations*

Having established the mechanisms to anticipate and monitor harm, the best available regulations often then look to determine whether, in light of these risks, the candidate company is capable of taking on the obligations that come with those risks. For example, the ISA requires that before starting a project:

[e]ach application for approval of a plan of work for exploration shall contain specific and sufficient information to enable the Council to determine whether the applicant is financially and technically capable of carrying out the proposed plan of work for exploration and of fulfilling its financial obligations to the Authority.<sup>191</sup>

Similar language is employed in the Model Contract, which requires that the Company submit an Initial Feasibility Report “in good faith and in accordance with International Standards . . . setting out all information known by the Company as of the Effective Date regarding the Minerals contained within Prospecting Area and the Company’s financial appraisal of the Prospecting Area as of the date on which such report is submitted to the Government.”<sup>192</sup> The Model Contract goes on to stipulate that the Initial Feasibility Report shall indicate “how the Company proposes to discharge its obligations under the Mining Law.”<sup>193</sup> In light of the inherent possibility of devastating harm, these regulations also necessarily include provisions dictating remuneration, restoration, and remediation for environmental degradation or other adverse impacts of the project. With these regulations in mind, drafters of seabed mining contracts can form terms that act as vital safeguards against the risks inherent in the industry.

*c. Liability and Remedies*

When harm, whether social or environmental, does occur, ISA regulations require that “[a] contractor shall promptly report to the Secretary-General in writing, using the most effective means, any incident arising from activities which have caused, are causing or pose a threat of serious harm to the marine environment.”<sup>194</sup> It goes on to detail the step-by-step process to determine the appropriate course of action in case of emergencies and requires “the contractor, prior to the commencement of testing of collecting systems and processing

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189. See *Decision of the Assembly of the International Seabed Authority relating to the Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese Crusts in the Area*, International Seabed Authority, Regulation 8, 6 (2012), [https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/isba-18a-11\\_0.pdf](https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/isba-18a-11_0.pdf) (last visited Nov. 1, 2020).

190. See Ochoa, *supra* note 160, at para. 5.5.g.

191. International Seabed Authority, *supra* note 189, at 9.

192. Ochoa, *supra* note 160, at para. 4.4.a.

193. *Id.* at 14.

194. International Seabed Authority, *supra* note 189, at 20.

operations, will provide the Council with a guarantee of its financial and technical capability to comply promptly with emergency orders or to assure that the Council can take such emergency measures.”<sup>195</sup> In this way, these ISA regulations provide for an emergency response plan that can be efficiently and effectively deployed by either the Company or the Council as the circumstances require. Similarly, the Model Contract employs this ISA provision and requires that:

[i]f Operations violate any requirement referred to [above] or otherwise have material adverse impact on the environment, the Company shall proceed diligently to restore the environment to its original and natural state (or to remediate the negative impact wherever restoration is impossible) and shall take appropriate preventative measures to avoid further material adverse impact on the environment.<sup>196</sup>

The Model Contract reaffirms the Company’s absolute responsibility for remedying any harm incurred by the project, stating that, “[n]othing in this section . . . shall relieve the company of its obligations under section 4.6.d to procure means to finance the full cost of environmental remediation and restoration as set forth in that section.”<sup>197</sup> This language is vitally important to ensure that there is no loophole or source of ambiguity through which the Company might potentially escape accountability for any harm inflicted by its Operations. The Model Contract also attempts to incorporate an excellent point made by participants in Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference: if multiple companies are engaged in seabed mining within a localized space, it may be very difficult or impossible to measure the impact any one of the companies is having on the marine environment, since debris and sediment will move with ocean tides and currents. It is important to establish mechanisms for ascribing harm and liability on a pro-rata or other shared basis in order to ensure that each party is not able to escape liability, leaving Vanuatu unprotected.<sup>198</sup>

The unsettling truth of enforcement for non-compliance for harm caused on the part of companies is that outcomes in disputes have historically been likely to be settled in favor of the company, including in the arbitration context.<sup>199</sup> The ISA is still in the process of developing draft exploitation regulations to provide frameworks for liability and enforcement for harm caused in the Area<sup>200</sup> and has described preliminary plans for enforcement procedures:

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195. *Id.* at 21.

196. Ochoa, *supra* note 160, at para 12.1.

197. *Id.* at 28.

198. Joel Simo, Head of the Land and Language Desk of the Vanuatu Cultural Center, Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference (October 8, 2014) (notes on file with author).

199. Parties to investor-state negotiations often choose an international arbitral tribunal as their dispute-settlement forum. For recent data on investor-state arbitration, including parties and outcomes, see *Fact Sheet on Investor-State Dispute Settlement Cases in 2018*, IIA ISSUES NOTE, UNCTAD Uni, United Nations Conference on Trade and Development (May 2019), [https://unctad.org/en/PublicationsLibrary/diaepcbinf2019d4\\_en.pdf](https://unctad.org/en/PublicationsLibrary/diaepcbinf2019d4_en.pdf).

200. *Draft Exploitation Regulations*, INTERNATIONAL SEABED AUTHORITY, <https://www.isa.org.jm/mining-code/ongoing-development-regulations-exploitation-mineral-resources-area> (last visited July 12, 2020).

The deep seabed regime anticipates that the Authority will have recourse to a range of administrative measures that differentiates between the seriousness of the potential harm and the degree to which the noncomplying behavior is understood to be intentional. The result is a graduated form of enforcement whereby sanctions will be preceded by less intrusive measures, such as warnings.<sup>201</sup>

The draft also discusses a number of possible frameworks for determining and enforcing liability for harms caused, noting that “[t]he scheme could operate at an international level and be overseen by an organ of the Authority or could be structured as a set of harmonized domestic requirements.”<sup>202</sup>

Enforcement and liability measures under a bilateral contract for mineral extraction within a national EEZ will of course require its own approach. Forum-selection and choice-of-law clauses are often vexing in commercial contracts, as the efficacy of the contract can be greatly affected by these provisions. How these provisions are drafted will greatly depend on each individual context. However, it is worth noting that one universally essential element of contract enforcement, for seabed mining as well as other extractive industries, is transparency in contract terms. The Model Contract, in Section 22.1, holds that details of the agreement are not confidential, unless specifically exempted within the terms of the contract.<sup>203</sup> Transparency alone, however, cannot result in more favorable outcomes for governments when disputes arise. The substantive provisions of the contract must be rebalanced as discussed herein such that terms, if breached, will result in a higher likelihood of favorable outcomes for the government and the ecosystems and communities it represents.

Intimately connected with the aims of creating a stable and predictable set of rights and obligations between the parties, is the objective of ensuring that the valuable contributions of each party to the agreement are fully appreciated. Royalty rates and other forms of compensation will be addressed at length in the next section.

## 2. *Second Objective: Recognize Value and Risk*

The contract will need to fully appreciate the full picture of potential benefits, risks and valuable contributions each party to the contract will be weighing and undertaking. While mining companies may hold the promise of being able to provide the machinery and technological expertise to access the mineral wealth on the seabed, that mineral wealth ultimately belongs to the citizens and governments of each country with jurisdiction over those resources. At the same time, both parties bear substantial risks. Companies will bear responsibility to investors or shareholders who have financed mining activity (including exploration, development, production, and project-end activities), while governments bear the risk of environmental catastrophes and poor management of the potential or actual income from mining activity, as well as

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201. Neil Craik, *Discussion Paper No. 4: Enforcement and Liability Challenges for Environmental Regulation of Deep Seabed Mining*, INTERNATIONAL SEABED AUTHORITY, 20 (June 2016), <https://www.isa.org.jm/files/documents/EN/Pubs/DPs/DP4.pdf>.

202. *Id.* at 24.

203. Ochoa, *supra* note 160, at para. 22.1.

the political risks that will attach to any form of significant mismanagement and accidents related to the mining activity on the part of the company or the government. The contract should reflect this reality and assure that the compensation paid to each party properly reflects the proportional contributions and potential risks each party bears.

It is common for royalty and tax rates in mining arrangements to be very low, diminishing the revenue due to the government and available for deployment to various development objectives. The argument for low royalty rates is often that the company is taking on such risk in its endeavors that it must be incentivized to make a long-term, risk-laden investment. The company owns the machinery, technology, and know-how to convert otherwise inaccessible mineral wealth into a monetizable commercially viable commodity. Given this knowledge and technology, the argument continues, the company ought to be compensated highly for its risk or there will be no incentive to undertake the activity.

While this is valid, it is also the case that the mineral wealth pertains to the country and, often, its citizens. And the country, its citizens, and the ecological systems inside the country take on significant risks when mining activity is undertaken. In addition, the non-renewable nature of mineral wealth heightens the risk calculation for a country that has one shot to get the revenue generation and distribution from mineral extraction right. Once the natural resources are gone, the country will never have that source of potential revenue again. The contract must recognize the bilateral nature of both the valuable contributions each party can make and the risks each party is assuming.

There are a number of tools countries use to take in revenue from mining operations. Functionally, the body of mechanisms function as taxes on mining activity, even when they are called royalties, duties or bonus payments, rather than income taxes or resource rent taxes. Together, these mechanisms are often referred to as the “fiscal regime” governing mining activity.<sup>204</sup> In addition, the government may consider requiring a percentage of ownership in the mining operations.<sup>205</sup>

The Model Contract, which was written with Vanuatu in mind, stipulates that “[t]he Company shall pay the Government a royalty of 30 percent (the “Royalty Rate”) multiplied by the fair market value of any materials and Products determined in accordance with this Section . . . (such payment collectively, the “Royalty”).”<sup>206</sup> This is a significant sum when compared to industry norms regarding royalties paid to countries in traditional mining contracts. However, to understand this significant deviation from royalty rates seen in other contexts, one must recall that Vanuatu has a corporate income tax rate of 0.00%.<sup>207</sup> By comparison, the corporate income tax rate for Oceania was

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204. NATURAL RESOURCE GOVERNANCE INSTITUTE, *supra* note 64, at 65.

205. PRICEWATERHOUSECOOPERS, CORPORATE INCOME TAXES, MINING ROYALTIES AND OTHER MINING TAXES: A SUMMARY OF RATES AND RULES IN SELECTED COUNTRIES (2012), 5.

206. Ochoa, *supra* note 160, at 38.

207. *Corporate Tax Rates Table*, KPMG, <https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html> (last visited Feb. 25, 2020).

28.43% in 2019 and the OECD average was 23.23%.<sup>208</sup> With corporate income tax currently an impossible vehicle for revenue generation, the royalty rate must be significantly higher than might otherwise be the norm.<sup>209</sup> This type of arrangement is at least facially consistent with the statements of one company representative at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference that included accounts of Nautilus Minerals' intentions of "looking to equitably share the benefit with the people of PNG" (referring to the Solwara 1 Project referenced above).<sup>210</sup>

In countries with corporate income tax rates in the range of 25-35%, it is common to see royalty rates in the range of 2-5%.<sup>211</sup> However, in the context of a 0% income tax, a country expecting to share in the revenue from mining operations will necessarily require a much higher royalty rate on the minerals extracted from their seabed.<sup>212</sup> Indeed, it is common to see higher royalty rates in countries with lower corporate income tax rates.<sup>213</sup> In general, "[a] corporate income tax is a standard element of every mining fiscal regime."<sup>214</sup>

Many countries are now involved in a general trend to increase royalty rates, and the Model Contract assumes countries undertaking this novel and risky activity will adopt modernized revenue models that include higher royalty rates.<sup>215</sup> One advantage of setting forth the fiscal regime in the contract between the parties is the possibility of embedding stability agreements with respect to the fiscal arrangements in the contract.<sup>216</sup>

The Model Contract is also crafted around the recognition of the finite nature of the resources being exploited and the value that they hold for development of important infrastructure<sup>217</sup> and educational opportunities in the country and the risks that mining the minerals presents to the country. For example, the Model Contract requires that "[t]he Company shall (and the Company will require any other contractors or subcontractors to) employ and give preference to the employment of qualified citizens of Vanuatu . . . it being the objective of the parties as soon as is practicable that the Operations under this

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208. *Id.*

209. Vanuatu does impose a value added tax, but a VAT is unhelpful to a country like Vanuatu in the seabed mining context. It is expected that the material extracted from the seabed will be shipped to Australia or China for processing and will not be consumed or processed in Vanuatu. *See Spalding, supra* note 188.

210. Paul Eagleson, Manager for Exploration and Polymetallic Nodules, Nautilus Minerals, Presentation at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference (October 8, 2014) (notes on file with author).

211. PRICEWATERHOUSECOOPERS, *supra* note 205, at 11-12.

212. The royalty rate would be based on an international reference price for arms-length transactions (to address transfer pricing difficulties) that is established by independent markets. Whether the royalty rate would be measured at the mining site or at the processing site is left to be established. Whether the royalties would be set on a sliding scale to account for changes in the productivity of the mine and whether the royalty will be fixed would also need to be determined. *See also* NATURAL RESOURCE GOVERNANCE INSTITUTE, *supra* note 64, at 70.

213. PRICEWATERHOUSECOOPERS, *supra* note 205, at 11-12.

214. NATURAL RESOURCE GOVERNANCE INSTITUTE, *supra* note 64, at 73.

215. PRICEWATERHOUSECOOPERS, *supra* note 205, at 3.

216. *See Id.* at 6 for additional information on tax stability agreements.

217. This seems consistent with the position Nautilus Minerals, for example, took in PNG, where the company agreed to build two new bridges. *See Eagleson, supra* note 210.



Agreement should be conducted and managed primarily by citizens of Vanuatu.”<sup>218</sup> Further, training for citizens for “financial, accounting, supervisory, managerial, executive positions” is required as are services and infrastructure to ensure the health and safety of those employees.<sup>219</sup> It also includes a provision for educational funding for Ni-Vanuatu people to pursue education in the fields of mining, geology, engineering, law, medicine, finance, development or other related disciplines.<sup>220</sup>

In addition to ensuring that adequate revenue is making its way back to the country whose resources are being exploited, it is important that the profits received are being invested in the country’s people and infrastructure, rather than siphoned off by elites. This is yet another instance in which the transparency of contract terms, in this case revenues, is especially important. Industry wide initiatives and systems of accountability serve important roles in ensuring that the fruits of extractive industry are shared with the communities most impacted by the activity. An apt example of this can be found in the Extractive Industry Transparency Initiative’s objectives:

that a country’s natural resources belong to its citizens, the EITI has established a global standard to promote the open and accountable management of oil, gas and mineral resources. The EITI Standard requires the disclosure of information along the extractive industry value chain from the point of extraction, to how revenues make their way through the government, and how they benefit the public. By doing so, the EITI seeks to strengthen public and corporate governance, promote understanding of natural resource management, and provide the data to inform reforms for greater transparency and accountability in the extractives sector. In each of the 53 implementing countries, the EITI is supported by a coalition of government, companies, and civil society.<sup>221</sup>

Just as companies are more likely to commit to equitable terms when they are made public, so too are countries more likely to ensure that revenues from extractive industries are distributed and invested to promote socially equitable ends.<sup>222</sup> Section 22.1 of the Model Contract asserts that:

The Government or the Company may, and the Government expects to, make public information relating to the timing and amount of Royalties and other payments specifically due or paid under the terms of this agreement and of Taxes and Duties payable or paid by the Company and the rates at which Royalties, Taxes and Duties or other payments become due or are assessed.<sup>223</sup>

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218. Ochoa, *supra* note 160, at 32. This seems consistent with the position Nautilus Minerals, for example, took in PNG, where as of October 2016, company representatives stated that 20% of Nautilus workforce in PNG was made up of PNG nationals. See Eagleson, *supra* note 210.

219. *Id.* at 33.

220. *Id.* It is common for countries to require social contributions of this sort from mining operations. See PRICEWATERHOUSECOOPERS, *supra* note 205.

221. *Who We Are: The EITI is the Global Standard to Promote the Open and Accountable Management of Extractive Resources*, EXTRACTIVE INDUSTRIES TRANSPARENCY INITIATIVE, <https://eiti.org/who-we-are> (last visited Oct. 16, 2020).

222. See EXTRACTIVE INDUSTRIES TRANSPARENCY INITIATIVE, PROGRESS REPORT 5 (2020), [https://eiti.org/files/documents/eiti\\_progress\\_report\\_2020\\_english.pdf](https://eiti.org/files/documents/eiti_progress_report_2020_english.pdf) (discussing the impact that “publishing information that matters to citizens” can have on that can efforts to “close avenues for corruption”); see also OXFAM, *supra* note 169.

223. Ochoa, *supra* note 160, at 51.

This provision serves to reinforce the values of transparency and to ensure that both parties acknowledge the importance and permissibility of making revenue flows and related processes public information.

### 3. *Third Objective: Accurately Reflect Promises*

This section observes that FPIC is viewed as the requisite process through which to arrive at a locally driven decision to permit or not permit mining activity. In the most critical light, FPIC is seen more skeptically as the process by which a local population grants mining companies the social license to operate. Whether viewed as a strong or a weak process, it is uniformly seen as process only. But this view fails to see the process as an important part of contract negotiations. The FPIC process itself is rich in content that should inform mining contracts. During the FPIC process, all stakeholders are presenting their hopes, concerns, and expectations about the likely harms and benefits that will result from the mining activity. Companies make a robust set of representations about the likely economic and development benefits that will result from mining activity, as well as about the likelihood of environmental, social, and cultural harms. Communities, on the other hand, make clear their own hopes and expectations with respect to mining activity. The objective, from the company's side, is to provide the information necessary to derive the community's consent. The community's objective is to make clear the terms on which that consent was granted.

It would be reasonable for communities that have granted their consent to seabed mining to believe that the terms, conditions, and demands they established during the FPIC process would govern the behavior of the government and the company during the life of the contract. This is highly unlikely, however, unless those terms are explicitly drafted into the four corners of the contract. As noted above, under the common law contract doctrine on parol evidence, even parties in privity of contract are usually unable to present extrinsic evidence that shows ambiguities, clarifies or adds terms to the express language of the contract. In other words, the representations of the companies or the government during an FPIC process may have little to no legal value unless those terms are expressly drafted into the language of the license agreement. This is especially true when the admitted terms can be categorized as future promises. Although the rule provides exceptions for "accident, fraud, or mistake of fact," allowing for evidence of foul play that may be admitted in certain cases, there is a significant level of ambiguity as to when fraud or duress can be shown to trigger an override of the rule.<sup>224</sup> Promises and informal agreements on which the consent of the community is based are especially crucial in negotiations for mining contracts. However, these types of statements in negotiations are often considered by courts to fall short of triggering an exception to the rule:

It is doubtless true that where the alleged fraud consists merely in promises which are not fulfilled, or statements as to future events, the courts are less inclined to infer

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224. *Parol-Evidence Rule; Right to Show Fraud in Inducement or Execution of Written Contract*, 56 A.L.R. 13 (1928).

a fraudulent intent than when the statements relate to a present or pre-existing fact. If one makes a statement regarding an event to take place in the future, obviously the statement should ordinarily be regarded merely as an expression of opinion, and the courts will frequently stop at this point and hold that such a statement cannot serve as a basis on which to predicate fraud.<sup>225</sup>

Thus, all essential prior agreements must be included in writing in the completed contract's terms in order to ensure that the promises that conditioned consent will be legally enforceable. For this reason, it is crucial that contract drafters be identified in anticipation of the FPIC process and incorporate the representations, expectations, and conditions on which the FPIC process was based into the express language of the contract. There is simply no other way to assure that community expectations will be legally enforceable.<sup>226</sup> The Model Contract was drafted to reflect both the promises made by the Company and the demands and expectations of the people of Vanuatu expressed during the preliminary negotiations and public hearings.

#### 4. *Fourth Objective: Embed State of the Art Environmental Management*

In order to reflect the proceedings during the initial consultation, the license agreement must be informed by Ecology Management Theory and Emerging Development Theory (precautionary principle, adaptive management, well-being approach). Each were central to the National Consultation held in October 2014 in Port Vila and must be incorporated in the contract to reflect the intention and understanding of the parties and to assure they are legally enforceable conditions, rather than hortatory aspirations.

##### a. *Ecology Management Approach*

An ecology management approach to development is an ecocentric approach, which incorporates ecology and conservation principles into frameworks for sustainable development.<sup>227</sup> Traditional approaches to development are often categorized by their anthropocentric nature, "characterized by the notion of human exceptionalism, [viewing] [h]umans, unlike other species [as] exempt from the constraints of nature, and the whole of

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225. *Promises and Statements as to Future Events as Fraud*, 51 A.L.R. 46 (1927).

226. During Vanuatu's First National Deep Sea Minerals Policy Consultation Conference, for example, company and SPC/DSM representatives made statements indicating that seabed mining would likely be a significant source of revenue for Vanuatu, that there would be very little waste and tailings from the activity, that seabed mining would need to use the best available technology, including "every possible measure to minimize the impacts on the environment," and would need to apply the precautionary principle and adaptive management process to the activity. *See Spalding, supra* note 188. *See also*, Cook, *supra* note 17; Eagleson, *supra* note 210.

227. This type of ecological management was called for by NGO representatives during Vanuatu's First National Deep Sea Minerals Policy Consultation Conference. *See, e.g.*, Mareen Penjueli, Coordinator of the Pacific Network on Globalization (PANG), Presentation at Vanuatu's First National Deep Sea Minerals Policy Consultation Conference, (October 7-9, 2014) (notes on file with author). Penjueli called for prioritizing indigenous peoples' relationship to the ocean rather than a relatively novel commodification of the ocean. She also insisted on the need to protect the interests of indigenous communities.

nature [as existing] primarily for human use, with no inherent value of its own.”<sup>228</sup> In contrast, an “ecocentric perspective” on development is “characterized by the belief that ecosystems have inherent worth for maintaining planetary homeostasis and all life. [This approach] reflects notions of holism, integration, and synthesis, according to which human cultural systems must function within the safe operating limits dictated by ecosystems.”<sup>229</sup>

Ecocentric approaches don’t preclude considerations of human need and development, but rather they seek to address those needs while avoiding “the most worrying aspect [of anthropocentric approaches, namely] that there seems to be no overall survival plan.”<sup>230</sup> Anthropocentrism and ecocentrism do not represent a dichotomy, but rather they are poles on a spectrum of approaches that, when properly harnessed, can be used to develop “transformational strategies”<sup>231</sup> that incorporate understanding across disciplines to create effective management approaches that promote social and ecological good.<sup>232</sup>

Critiques of an ecocentric approach to development mainly center on an alleged inherent valuing of environmental conservation over human well-being. Yet just the opposite is often true. Looking to the example of Vanuatu, it is clear that the well-being and happiness of its communities is intricately connected to the well-being of the surrounding ecosystems. In the last publication of the Happy Planet Index in 2016, Vanuatu ranked 4<sup>th</sup> out of 140 countries when measuring the happiness of its people, and it has consistently ranked among the happiest countries, taking the top spot in 2006.<sup>233</sup>

In 2019, the British Broadcasting Corporation conducted a short documentary on the topic in which a local man explains the high rates of happiness on the islands as “a consequence of how respectful [Ni-Vanuatu] are with the nature; how we manage the land, how we manage the water.”<sup>234</sup> A local artist contributes that people own the land and have consistent access to growing and gathering food, and the resulting freedom from reliance on money is a core explanation of the high levels of satisfaction.<sup>235</sup> The documentary goes on to highlight that “most people in Vanuatu can access healthy sea and forest resources.”<sup>236</sup> As a result, examples of an ecology management approach can be

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228. Helen Borland, et al., *Building Theory at the Intersection of Ecological Sustainability and Strategic Management*, 135 J. BUS. ETHICS 293, 295 (2014), <https://link.springer.com/content/pdf/10.1007%2Fs10551-014-2471-6.pdf>.

229. *Id.* at 296.

230. *Id.* at 295.

231. *Id.* at 305.

232. This type of approach is highlighted, for example, by asking how communities in Vanuatu could adequately and holistically be compensated for loss of food sources, cultural values, and the social security that comes from intact communities. See Francis Hickey, Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference (October 8, 2014) (notes on file with author). In asking this question, Hickey was asking audience members to be skeptical about the ability of cash payments to ever be wholly adequate.

233. *Vanuatu*, HAPPY PLANET INDEX (2016), <http://happyplanetindex.org/countries/vanuatu> (last visited Nov. 1, 2020).

234. *Why is this country one of the happiest places on earth?* BBC: REEL (Sept. 30, 2019), <https://www.bbc.com/reel/video/p07pr9sw/why-is-this-country-one-of-the-happiest-places-on-earth->.

235. *Id.*

236. *Id.*

found in the Model Contract's implementation of processes in line with the precautionary principle and adaptive management approach such as requiring environmental impact assessments and a preliminary environmental management plan to prevent potential adverse impacts and provide for any necessary remediation.<sup>237</sup>

An ecocentric management theory is complemented by other emerging theories of development centered on social and environmental values and which prioritize sustainable development for the host country over the economic gain of private parties. These previously discussed doctrines include the precautionary principle, adaptive management, and the well-being approach, and they present alternative perspectives on development that emphasize equity, community engagement and sustainable practices. Each of these theories, along with an ecology management approach, will be further developed below with examples of their application in the Model Contract.

*b. Well-being Approach*

Vanuatu's National Sustainable Development Plan and the Model Contract both provide examples of an ecocentric approach to development in which the well-being of the people of Vanuatu and its future generations are given the highest priority. The Development Plan affirms the country's commitment to maintaining "a pristine natural environment on land and at sea serving [its people's] food, cultural, economic, and ecological needs" in recognition of the vital role of ecological stability as "fundamental to [the] well-being and prosperity" of the Ni-Vanuatu people.<sup>238</sup> Applied in tandem with an ecocentric approach, the well-being approach provides a more holistic understanding of the human experience of development and its widespread impacts. The well-being approach to development "goes beyond a narrow focus on policy or programme objectives to comprehend the real impact on people's lives,"<sup>239</sup> responding to "the need to move beyond a sole or primary emphasis on economic growth as the marker of progress."<sup>240</sup> The Model Contract applies a well-being approach through its requirements for social services, local hiring, and educational funding,<sup>241</sup> and additional terms, such as relatively high royalty rates,<sup>242</sup> that center the prosperity and well-being of the Ni-Vanuatu people over efficiency and profit. Given the central role of the surrounding ecosystems to the happiness and well-being of communities on the islands discussed at length in the previous section, it is of vital importance that approaches to development in Vanuatu incorporate understandings of the interconnected nature of the well-being of the Ni-Vanuatu people and the surrounding environment.

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237. See Ochoa, *supra* note 160, at 15-18.

238. Vanuatu Department of Strategic Policy, Planning, and Aid Coordination, *Vanuatu 2030: The People's Plan: National Sustainable Development Plan 2016 to 2030*, 5 (2016).

239. Sarah C. White, *Wellbeing*, Governance and Social Development Research Center (July 2015), <https://gsdrc.org/professional-dev/wellbeing/>.

240. *Id.*

241. See Ochoa, *supra* note 160, at 32-33.

242. *Id.* at 38.

*c. The Precautionary Principle*

The precautionary principle is another necessary element of a sustainable and equitable development regime. Principle 15 of the Rio Declaration on Environment and Development incorporated the principle positing that “[i]n order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”<sup>243</sup> The preamble to the Convention on Biological Diversity affirms this commitment, holding: “where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.”<sup>244</sup>

In the Model Contract, the precautionary principle (or approach) is the foundation on which all other contract terms are built: “The Government and the Company both recognize that seabed mining is novel activity, the benefits and effects of which little is known, requiring all provisions of this agreement to be consistent with adaptive management approaches and the Precautionary Principle.”<sup>245</sup> The precautionary approach is defined in the Model Contract as “employing caution in the context of uncertainty and anticipating harm before it occurs . . . [meaning] that Prospecting shall not be undertaken if substantial evidence indicates the risk of serious harm to the marine environment.”<sup>246</sup> The viability of the seabed mining industry is hotly contested, with many arguing that the proper application of the precautionary principle demands a moratorium on seabed mining, there being too much unknown and too much at stake. However, under current international regulatory regimes, each country ultimately has the right to decide whether to place a moratorium on these types of activities within its sovereign territory. If countries, informed of the unknowable and potentially disastrous nature of the risks of seabed mining to some of their most valuable resources and ecosystems, decide to engage in the activity, the role of contracts and regulatory systems that incorporate the precautionary principle and an adaptive management approach (as demonstrated by the above excerpts from the Model Contract) is of vital importance to avoiding the most devastating of harms and ensuring accountability for the harms that do occur.<sup>247</sup>

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243. Rio Declaration on Environment and Development, June 13, 1992 31 ILM 874 (1992).

244. Convention on Biological Diversity, Feb. 8, 2007.

245. Ochoa, *supra* note 160, at 2.

246. *Id.* at 7. A number of representatives at Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference indicated the importance of the precautionary principle in the seabed mining context. *See, e.g.*, Spalding, *supra* note 188; Rose Koian, Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation (October 8, 2014) (notes on file with author); Maureen Penjueli, Presentation at Vanuatu’s First National Deep Sea Minerals Policy Consultation (October 8, 2014) (notes on file with author). *See also* photos of posters created by discussion groups at the conclusion of the conference, in which participants indicated the importance of the precautionary principle to any consideration of seabed mining (on file with author).

247. For countries that decide to pursue seabed mining, even in light of the risks, the Model Contract can provide a number of concrete examples for how the parties’ stated commitments to a precautionary approach is to be implemented once operations are underway, including in Section 12, “Environmental Protection and Management,” which provides that, “If Operations . . . have material

*d. Adaptive Management Approach*

An adaptive management approach to development centers on “improving resource management by learning from management outcomes . . . [by] exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions.”<sup>248</sup> Adaptive management allows for contract terms that respond to the realities of operations that are steeped in unknown and unknowable risks by incorporating measures that allow for halting operations in order to reassess the risks and benefits of the project.<sup>249</sup> Adaptive management, along with the precautionary principle, was the most widely advocated form of environmental management during Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference. For example, company representatives advocated for a “baby steps approach” that would allow for assessing impacts along the way and measuring every step carefully in order to develop the world’s best practice.<sup>250</sup> Similarly, governmental and SPC/DSM representatives suggested the possibility of an adaptive management approach, asking, for example, whether seabed mining can be undertaken in stages and where governments could restrict the scope or stop the activity based on the emergence of unexpected or undesirable consequences.<sup>251</sup>

Vanuatu’s National Sustainable Development Plan outlines the country’s development aspirations including: “[m]aintaining a pristine natural environment on land and at sea that serves [the island’s] food, cultural, economic, and ecological needs . . . [and a] stable economy based on equitable, sustainable growth, that creates jobs and income-earning opportunities accessible to all people in rural and urban areas.”<sup>252</sup> The cultural, social,

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adverse impacts on the environment, the Company shall proceed diligently to restore the environment to its original and natural state (or to remediate the negative impact where restoration is impossible) and shall take appropriate preventative measures to avoid further material adverse impact on the environment.” Section 13, “Updating the PEIA and the PEMP, and Other Environmental Matters,” requires that the Company update environmental impact and risk assessments “to reflect the actual status of Operations at the time” and that Operations cease during any environmental restoration or remediation as required. Ochoa, *supra* note 160, at 35-37.

248. BYRON K. WILLIAMS, ET. AL., *ADAPTIVE MANAGEMENT: THE U.S. DEPARTMENT OF THE INTERIOR TECHNICAL GUIDE*, 1 (2009).

249. Many of the most well-developed regulatory regimes for seabed mining have explicitly adopted the adaptive management approach. New Zealand’s submission to the ISA affirms its commitment to an adaptive management approach to seabed mining:

the New Zealand Government sees adaptive management as a structured, iterative process of robust decision-making in the face of uncertainty, with the aim of reducing uncertainty over time through system monitoring and adapting management practices in response to what has been learnt. The challenge in using adaptive management lies in finding the correct balance between gaining knowledge to improve management in the future and achieving the best short-term outcome, including appropriate environmental protection, based on current knowledge.

The New Zealand Government, Ministry for the Environment, *New Zealand’s Experiences with Adaptive Management for Seabed Mining Projects*, 7 (2016) [www.mfe.govt.nz](http://www.mfe.govt.nz).

250. Cook, *supra* note 17.

251. See, e.g., Johnson, *supra* note 114; Spalding, *supra* note 188.

252. Vanuatu Department of Strategic Policy, Planning, and Aid Coordination, *supra* note 238,

economic, and democratic value of a stable ecosystem and climate is consistently emphasized throughout the Development Plan, highlighting the intersections of ecocentric management, the precautionary principle, adaptive management principles and the well-being approach necessary for sustainable development in the country in accordance with the will of its people.

The Model Contract is structured around these values, reflecting them in many of its definitions and terms. For example, in Section 12 on “Environmental Protection and Management,” it is reaffirmed that the agreement “is intended and at all times should be interpreted to be consistent with and to give effect to the Precautionary Approach and the Adaptive Management Approach in all aspects of Prospecting and Operations.”<sup>253</sup> The Section then goes on to require that the Company conduct its operations in compliance with “all applicable Law” and a number of guidelines, standards, and best practices for the industry, requiring that “[t]he Company shall take appropriate preventative measures to protect all water bodies wholly or partially within and bordering Vanuatu, all dry land surfaces, and the atmosphere from pollution, contamination or damage resulting from Operations.”<sup>254</sup> The section further provides that:

If Operations violate any requirement referred to [above] or otherwise have material adverse impact on the environment, the Company shall proceed diligently to restore the environment to its original and natural state (or to remediate the negative impact where restoration is impossible) and shall take appropriate preventative measures to avoid further material adverse impact on the environment.<sup>255</sup>

As the above sections demonstrate, the Model Contract, through its incorporation of the precautionary principle and the adaptive management approach, tailors the agreement to serve the well-being of the people of Vanuatu as defined by the people themselves in the Development Plan, and to protect their interests from as much harm as possible in the face of the known, unknown, and unknowable risks inherent in the contested practice of seabed mining.<sup>256</sup>

Together, ecocentric approaches to management theory, adaptive management, the precautionary principle, and the well-being approach present an emerging theory of development with equitable principles, community well-being, and sustainable development at its heart. As discussed above, traditional mining contracts expose the exploitative nature of agreements that often leave the local community with little to show for the project beyond environmental degradation. A commitment to implementing these theories of management is an essential element of contract drafting for exploitative industries, as well as to build on and improve the seabed mining regulations promulgated in the 1970s

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at 4.

253. Ochoa, *supra* note 160, at 35.

254. *Id.*

255. *Id.*

256. It is important to note, as Richard Johnson, Malcolm Clark and Francis Hickey each emphasized during Vanuatu’s First National Deep Sea Minerals Policy Consultation Conference, that the adaptive management approach depends on good information about the baseline conditions of the water, flora, fauna, and other conditions of the ecosystem prior to the activity being undertaken. This is information that is incomplete right now. *See* Johnson, *supra* note 114; Clark, *supra* note 148; Hickey, *supra* note 232.



and 1980s, as they provide adaptive and intentional frameworks in which to build agreements that will be representative of, and responsive to, the needs of the ecosystems and communities most impacted by the project.

#### CONCLUSION

While much has been written over the past decades about the prospect of deep sea mining in international waters, relatively little attention has been devoted to the prospect of seabed mining within the national territories of individual nations. Although the seabed falling within the jurisdiction of UNCLOS is vast, far more attention must be devoted to the governance regimes pertaining to seabed mining within the jurisdiction of individual countries and the governance regimes that regulate such mining.<sup>257</sup> Experimental seabed mining companies have secured licenses to explore nearly four times the oceanic territory *within* national jurisdictions than outside of national domains.

Because of their proximity to the hydrothermal vent fields that hold the promise of very valuable minerals, countries in the South Pacific find themselves grappling with the prospect of becoming the first sites of seabed mining. Few of these countries have significant experience with land-based mining, and none has any experience whatsoever with seabed mining. As a result, they lack the constitutional structures, legislative landscape, and administrative capacity to adequately regulate this high-risk activity.<sup>258</sup> Still, some Pacific Island countries are considering seabed mining, and some have already issued licenses for exploration of exploitation of the seabed within their jurisdiction.<sup>259</sup> In addition to lacking adequate governance structures to address seabed mining, many of these countries are unprepared to grapple with the potential impacts the mining will have on the natural environment and the communities that rely on the ocean for their sustenance and well-being.<sup>260</sup> While it may be advisable to place moratoria on seabed mining until such legal and social support systems are in place, not all countries have chosen this path.

The license agreement governing any seabed mining must provide the vital infrastructure to assure that countries and their communities are able to realize the promises of economic development, while also protecting the natural environment. This is especially necessary for countries with new or weaker governance regimes. Recent scholarship analyzing land-based mining contracts helps to illuminate best practices for establishing strong, stable, and respectful

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257. See generally, Tomoko Kakee, *Deep-Sea Mining Legislation in Pacific Island Countries: From the Perspective of Public Participation in Approval Procedures*, 117 MARINE POL. 103881 (2020).

258. For an overview of the environmental and social impacts of seabed mining, see Julian Aguon & Julie Hunter, *Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Regime*, 38 STAN. ENV. L.J. 3 (2018).

259. See BLUE OCEAN LAW & PACIFIC NETWORK ON GLOBALIZATION, RESOURCE ROULETTE: HOW DEEP SEA MINING AND INADEQUATE REGULATORY FRAMEWORKS IMPERIL THE PACIFIC AND ITS PEOPLES, 10-17 (2016). Papua New Guinea has issued exploitation licenses as well; see *supra* notes 24-29 and accompanying text.

260. BLUE OCEAN LAW & PACIFIC NETWORK ON GLOBALIZATION, *supra* note 259. See also Julie Hunter, Pradeep Singh & Julian Aguon, *Broadening Common Heritage: Addressing the Gaps in the Deep Sea Mining Regulatory Regime*, HARV. ENVTL. L. REV. ONLINE (Apr. 16, 2018), <http://harvardelr.com/2018/04/16/broadening-common-heritage/>.

relationships between mining companies and the countries where they operate. Any contracts developed in the context of seabed mining should adopt the best available practices, especially given the high-risk nature of this novel activity.

Among other objectives, the contracts must assure that while compensating mining companies for their risk and technology, they also adequately compensate the countries for economic, social, and environmental risks as well as the valuable resources hidden below the sea. Such contracts must also recognize that any social license to operate has been attained because of promises made to the government and to communities.<sup>261</sup> These promises concern economic gains that will accrue to the government, the social projects that will be undertaken by companies, the employment and infrastructure that will accompany the projects (or that might be built because of them), and the importance the companies claim with respect to environmental protection. To have legal effect, these promises must be embedded into the four corners of the contract. Finally, given the projected risks of environmental harm from seabed mining, the contracts must embed strong environmental management regimes into their terms.

This Article was inspired and informed by fieldwork in Vanuatu. When that country entered into its initial license agreements, Vanuatu had no seabed mining legislation, and the licenses were insufficiently detailed, consequential, or enforceable. The author was engaged by Vanuatu to provide advice on the contractual aspects of seabed mining and provided advice and consultation, including in the form of a Model Contract to which this Article has referred throughout.<sup>262</sup> The Model Contract was designed to serve as a basis for negotiation toward a robust contract with seabed mining companies requesting access to Vanuatu's seabed minerals. Since then, Vanuatu has not entered into any new license agreements—indeed the Prime Minister of Vanuatu recently supported a call for a 10-year moratorium.<sup>263</sup> Still, the insights of the Model Contract and other existing resources regarding best available practices for mining contracts provide a vital resource for governments considering cautiously venturing into seabed mining within their territories.

Students of contracts are often taught that a contract is only as good as its enforcement. In the context of seabed mining, as in every other contractual situation, the enforcement of the contract is an essential component to assuring recovery in the event of breach. Even a party who ultimately suffers grave harm from their contracting partner can never be assured *ex ante* of recovery. Still, contracts possess other valuable capacities. The process of contract drafting and negotiating, the insistence on incorporating promises made during the consultation process, and the act of good governance demonstrated by making

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261. See Colin Filer & Jennifer Gabriel, *How Could Nautilus Minerals Gain the Social License to Operate the World's First Deep Sea Mine?* 95 MARINE POL. 394 (2018) (discussing the difficulties in defining the communities and "negotiation space" from which seabed mining companies must attempt to extract social licenses to operate); Cook, McConachy, & Egden, *supra* note 157.

262. Ochoa, *supra* note 160.

263. Doherty, *supra* note 25.

the contract a public document,<sup>264</sup> all serve significant performance and enforcement functions. If governments pursue seabed mining, such contracts will help to provide the essential legal infrastructure necessary to protect countries, communities, and ecosystems.

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264. Some terms may be redacted to ensure that intellectual property and corporate secrets (such as the precise location of mineral finds) are protected.