



Dingwall, J. (2020) Aline L. Jaeckel, *The International Seabed Authority and the Precautionary Principle: Balancing Deep Seabed Mineral Mining and Marine Environmental Protection* (Leiden: Brill Nijhoff, 2017), 362 pp. *Ocean Yearbook Online*, 34(1), [Book Review].

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Deposited on: 24 June 2022

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The International Seabed Authority and the Precautionary Principle – Balancing Deep Seabed Mineral Mining and Marine Environmental Protection. BY ALINE L JAECKEL, Brill/Nijhoff, Leiden, 2017. 362 pp.

The mining industry is increasingly looking seawards due to advances in subsea technology combined with rising material consumption and anticipated scarcity of terrestrial mineral resources. Within the next decade, States and other commercial actors may begin to extract minerals from the deep seabed beyond national jurisdiction (known as the “**Area**”).

Deep seabed mining activities in the Area are regulated on behalf of humanity by the International Seabed Authority (the “**ISA**”). The ISA is an autonomous international organisation headquartered in Jamaica, and it was established by the United Nations Convention on the Law of the Sea 1982 (“**UNCLOS**”).¹ As of August 2019, the ISA has entered into mining contracts with a total of twenty-nine contractors for exploration in relation to the three types of metallic deep seabed minerals which it currently regulates (namely, polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts).

Although the exploration phase of deep seabed mining in the Area is well regulated, much of the existing legal structure has yet to be applied in practice and many legal rules have still to be developed, particularly as regards protection of the Area’s marine environment, the process for exploitation of deep seabed resources and the eventual distribution of the economic benefits of mining. At present, the ISA is working to develop and augment its body of regulations, known as the Mining Code, in relation to all of these areas.

Indeed, as the ISA Secretary-General has noted, key challenges to commercialisation of deep seabed mining include proving that deep seabed mining can ‘be achieved in an environmentally sustainable manner’ and adopting ‘an exploitation code that [is] transparent and flexible enough to allow for adjustments to its environmental provisions for new information and advances in technology to be incorporated into it.’² Arguably this is the main test facing the industry: to create a sustainable system for deep seabed mining which satisfies humanity’s increasing desire for raw materials while ensuring robust levels of marine environmental protection.

In this context, Dr Aline Jaeckel’s assessment of the balance between deep seabed mining and marine environmental protection within the Area is a welcome and timely contribution. This book, based upon Jaeckel’s doctoral thesis, aims to examine whether and to what extent the ISA is implementing the precautionary principle in practice. Precaution is defined in the Rio Declaration in the following terms: ‘[w]here 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

¹ United Nations Convention on the Law of the Sea (adopted and opened for signature 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 (English language version at 397).

² ISA Press Release, ‘Commercialization of Marine Minerals in Deep Seabed Well Within Reach, International Seabed Authority Secretary-General States as He Introduces Annual Report’ (19 July 2016) SB/22/11.

environmental degradation.’³ In its regulation and management of deep seabed mining, is the ISA implementing this approach? To determine this, the author examines the ISA’s development of environmental protection standards and assesses the ISA’s procedural safeguards and decision-making processes. The book is structured across three parts. Part I (*Chapters 1-2*) provides context for Jaeckel’s examination, by providing an introduction to deep seabed mining, the marine environment and the precautionary principle. Thereafter, Part II (*Chapters 3-5*) provides a detailed assessment of the ISA’s role and its environmental mandate. Following on from this, Part III (*Chapters 6-9*) then assesses the ISA’s implementation of the precautionary principle.

Jaeckel’s book is the first study to critically examine the ISA’s implementation of its environmental mandate during the exploration phase of deep seabed mining in the Area. Of particular value in this regard, together with an assessment of the ISA’s legal framework, the author also analyses ‘its actual application and implementation in the work of the ISA as a practical manner’ (18). To this extent, this book will be of value to both academic lawyers interested in the law of the sea and deep seabed mining, and practitioners alike. Jaeckel implements this approach by engaging in a thorough analysis of the practice of the ISA, as revealed by its working documents, such as its decisions, reports and procedures, as examined against the backdrop of the legal framework for deep seabed mining (22-23). In addition, Jaeckel engages in useful comparative analysis throughout the book, drawing comparisons with other international legal regimes to place the ISA’s endeavours in a broader context.

As Jaeckel explains, the aims of her study are fourfold: to provide a comprehensive analysis of the ISA’s environmental mandate; to shine a light on this mandate by analysing the inner workings of the ISA; to provide a concrete assessment of the practical application of the precautionary principle; and, ultimately, to identify ‘procedural and institutional arrangements that are and/or can be adopted to ensure the precautionary management of deep seabed mining by the ISA’ (19).

Chapter 1 sets the scene for the author’s assessment, by exploring the challenges raised by the onset of deep seabed mining in environmental terms (7-14) and the need for a precautionary approach to deep seabed mining (14-18). As Jaeckel rightly explains, the present moment (i.e., before the commencement of commercial exploitation activities in the Area) is the critical time to engage in such an assessment, because the upcoming exploitation phase of deep seabed mining has the potential to be the most damaging in environmental terms (11, 19-20).

In Chapter 2, Jaeckel addresses the precautionary principle in international law. She examines the meaning, status, development and context of precaution within the international legal system, emphasising the scope for the principle’s practical implementation in relation to biodiversity protection and natural resource management (27 *et seq.*). This analysis allows Jaeckel to identify three dimensions for implementing precaution: institutional mechanisms, procedural means and protective measures (44-47). She employs these dimensions to develop a set of steps for the operationalisation of the precautionary principle (66-69), which she later deploys in Part III of her study in order to assess the extent to which the ISA is implementing the precautionary principle in practice. This approach is depicted helpfully in graphic form as the

³ Rio Declaration on Environment and Development, UN Conference on Environment and Development (12 August 1992), UN Doc A/CONF.151/26 (vol I), Principle 15.

implementation cycle of the precautionary approach (67). However, before the author turns to address this implementation analysis in Part III, it is necessary for her to set out the institutional structure and the mandate of the ISA, which she addresses in Part II.

Therefore, having introduced the key aspects underlying her study, Jaeckel moves in Chapter 3 to begin Part II of her assessment, by providing a solid overview of the ISA and the deep seabed mining regime within which it operates. The focus of Chapter 3 is to assess the historical development of the ISA, together with its structure and decision-making processes. This allows Jaeckel to identify the scope of the ISA's law-making powers and the extent of its general mandate to control deep seabed mining activities in the Area. As Jaeckel concludes, the challenge for the ISA 'lies in utilising [its] competencies to implement the precautionary approach in line with [its] environmental mandate' (115).

This initial foray into the ISA's competencies in Chapter 3, sets the scene for Jaeckel to devote Chapters 4 and 5 to a detailed appraisal of the ISA's environmental mandate. Jaeckel begins Chapter 4 by assessing the ISA's environmental mandate under UNCLOS and the Agreement on the Implementation of Part XI of UNCLOS ("**1994 Agreement**").⁴ Jaeckel includes consideration of the extent to which 'the law of the sea has moved on' and the precautionary approach, although missing from the explicit terms of UNCLOS itself (and the 1994 Agreement), can be interpreted into the text of the instrument (136). She concludes in the affirmative, on the basis of analysis of case law and scholarly opinion (131-136). This finding allows Jaeckel to conclude that the obligation for the ISA to apply a precautionary approach, now included in the Mining Code, can also be interpreted into UNCLOS (141).

Although beyond the scope of her inquiry, Jaeckel also includes a brief and topical analysis of the extent to which bioprospecting (by which she means 'the search for and usage of genetic material for commercial purposes' (137)) is connected with the ISA's environmental obligations (136-141), concluding that the ISA's work remains relevant for bioprospecting activities and that the ISA's mandate could be expanded further in the future in this regard, depending on the direction of the ongoing negotiations for the development of a new treaty regulating marine biodiversity beyond national jurisdiction.⁵

As Jaeckel recognises, UNCLOS and the 1994 Agreement provide the framework for the ISA to develop a comprehensive system for deep seabed mining, through the ISA's far-reaching power to adopt rules, regulations and procedures binding on all member States irrespective of individual consent (141-143, 147). As such, Chapter 5 complements Jaeckel's earlier analysis by carefully and rigorously assessing the ISA's further development of its environmental mandate through its adoption of the Mining Code to date (143-187), including features such as the assessment and monitoring of environmental impacts (157-166), establishment of marine protected areas (166-173), adoption of best environmental practices (173-174), together with the role of emergency orders (174-175) and other enforcement and

⁴ Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (adopted 28 July 1994, entered into force provisionally 16 November 1994 and definitively 28 July 1996) 1836 UNTS 3.

⁵ For an overview of the current status of the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, see <www.un.org/bbnj/>.

liability aspects (175-176). Chapter 5 also addresses the important impact of the 2011 Advisory Opinion of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (“**ITLOS**”) on the distribution of responsibility and liability within deep seabed mining regime (187-189).⁶

Although the ISA’s Mining Code has evolved further in the period since this book was published,⁷ this book continues to provide an essential grounding on the broad framework of environmental obligations incumbent upon the ISA, sponsoring States and deep seabed mining contractors. Indeed, as Jaeckel notes in her conclusion to Chapter 5, it is by virtue of this ‘inherently evolutionary design’ of the UNCLOS deep seabed mining system that the ISA is in the position to adopt and review its environmental regulations to take account of new scientific understandings (187).

In concluding Part II, Jaeckel notes that she could end her study here by ‘stating that the precautionary principle is implemented in the ISA regime, as evidenced by the fact that it has been progressively incorporated into the ISA’s regulatory framework’ (189). However, she eschews such a conclusion on the basis that it would be both ‘premature’ and ‘misleading’, given that determination that the ISA has implemented the precautionary principle in practice would be the only true basis for reaching such a conclusion (189).

Therefore, having thoroughly assessed the extent of the ISA’s environmental mandate, Part III moves to analyse the extent to which the ISA is implementing the precautionary principle in practice. Once again, Jaeckel reiterates the need to consider three dimensions in implementing precaution: protective measures, procedural measures, and institutional capacity (193). On that basis, Chapter 6 begins Part III by examining the range of protective measures which the ISA has employed to implement the precautionary principle. These include marine scientific research (195-201), marine protected areas (201-215), certain measures pertaining to particularly vulnerable ecosystems (215-218), the listing of particular activities or substances that are presumed to cause (or not to cause) serious environmental damage (219-220), emergency orders (220-221), and environmental restoration measures (221-224). In doing so, Jaeckel uses the elements of effectiveness, proportionality and early action as assessment criteria to evaluate the ISA’s protective measures (194).

The analysis in Chapter 6 affords an informative snapshot of the ISA’s initial attempts to implement precaution. Jaeckel reaches a mixed conclusion, noting that ‘some important protective measures foreseen in the Mining Code have not yet been implemented’ (225), while also recognising that in certain areas (such as in relation to environmental management plans, marine protected areas and marine scientific research), the ISA has implemented positive precautionary measures in practice that go beyond the requirements of the Mining Code (224-225).

Following on from this, Chapter 7 turns to consider the procedural elements which the ISA has at its disposal to implement precaution. In particular, Jaeckel

⁶ *Responsibility and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area* (Advisory Opinion of 1 February 2011) ITLOS Reports 2011, 10.

⁷ For example, the ISA released its most recent iteration of its draft regulations and standard contract terms for mineral exploitation in the Area in March 2019; ISA Legal and Technical Commission, ‘Draft Regulations on Exploitation of Mineral Resources in the Area’ (25 March 2019) ISBA/25/C/WP.1.

focuses on the extent to which the ISA has sufficient procedures in place to: assess the risks and uncertainties which deep seabed mining poses; amend its environmental standards in a flexible manner; ensure that decision-making is transparent and participatory; ensure appropriate allocation of the burden of proof; and monitor compliance with environmental protection measures (229). In doing so, Jaeckel identifies several challenges for the ISA's procedural framework that could undermine the implementation of precaution. To address these, she suggests a number of practical proposals which the ISA could take on board to resolve these challenges, including in relation to the environmental impact assessment process, which she identifies as a clear area in need of improvement (249 *et seq.*). Jaeckel concludes also that in order to address its procedural shortcomings, the ISA will require greater institutional capacity (280), which is the focus of her following Chapter.

Having addressed 'the *what, when, and how* of the [ISA's] implementation of the precautionary approach', Jaeckel uses Chapter 8 to focus on 'the *who,*' by addressing the institutional aspects which may allow the ISA to implement the precautionary principle (281). She does this by critically evaluating the ISA's institutional capacity to assess environmental risks, select appropriate protective measures and ensure contractor compliance with the regulatory framework. Jaeckel highlights the limitations within the ISA's institutional structure, such as the shortcomings of the ISA Secretariat and the ISA's expert body, the Legal and Technical Commission, including problems concerning unmanageable workloads and lack of environmental expertise (289-294). To address these issues, Jaeckel concludes by offering options for institutional innovation to mitigate the ISA's institutional limitations (294-300), including the potential establishment of an Environmental Commission and an inspectorate body to deal with the growing pressures of the burgeoning deep seabed mining industry (302).

Finally, in Chapter 9, Jaeckel amalgamates all the stands of her analysis by reaching conclusions both as regards the complexities of implementing the precautionary principle in practice and concerning the arguable strengths and weaknesses of the ISA's current approach to precaution (305-310). On balance, while recognising that 'the ISA has certainly been active with respect to some aspects of its comprehensive environmental mandate' (309), Jaeckel concludes that it still has far to go, as its application of the precautionary principle is 'limited at present' (310). The author draws specific attention to the challenges of establishing 'a procedural framework that enables effective risk assessment and adjustment of risk management measures as well as a timely implementation of protective measures' (310), pointing in particular to the ISA's shortage of resources and institutional capacity together with its 'lack of a strategic vision for environmental management' (310). On the basis of this assessment and the previous conclusions reached throughout the book, the author helpfully reiterates a range of practical suggestions, in tabular form, which the ISA could employ to strengthen its implementation of the precautionary principle, including protective measures (311), procedural measures (311-313) and institutional measures (313).

Jaeckel's study is an important and thorough contribution to an increasingly significant area. By combining academic analysis with real-life practical evaluation of the ISA's institutional workings, the author goes beyond many other works in this field. In this highly informative and well-structured book, Jaeckel takes us into the inner workings and machinations of the ISA and evaluates the notable distance that it has to go to realise effective implementation of the precautionary principle in relation to

deep seabed mining activities. As this book was completed while the ISA's Mining Code continues to develop, it does not capture the continued evolution of the ISA's environmental mandate. However, despite the ongoing development of the deep seabed mining regime, this book continues to afford an authoritative account of the extent to which the ISA is managing the balance between the competing aims of marine environmental protection and the realisation of commercial mining activities in the Area. As such, this book will remain valuable and pertinent in the coming years, as the deep seabed mining industry becomes increasingly operational.

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