



Environmental Impact Assessment process for deep-sea mining in ‘the Area’



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A B S T R A C T

Environmental Impact Assessment (EIA) is key to the robust environmental management of industrial projects; it is used to anticipate, assess and reduce environmental and social risks of a project. It is instrumental in project planning and execution, and often required for financing and regulatory approval to be granted. The International Seabed Authority currently requires an EIA for deep-sea mining (DSM) in areas beyond national jurisdiction (the Area), but the existing regulations present only a portion of a robust EIA process. This article presents an ideal EIA process for DSM, drawing upon the application of EIA from allied industries. It contains screening, scoping and assessment phases, along with the development of an environmental management plan. It also includes external review by experts, stakeholder consultation, and regulatory review. Lessons learned from application of EIA elsewhere are discussed in relation to DSM, including the integration of EIA into UK domestic law, and the reception of EIAs prepared for seabed ore extraction in the Exclusive Economic Zones of New Zealand and Papua New Guinea. Finally, four main challenges of implementing the EIA process to DSM in the Area are presented: 1) EIA process for DSM needs to incorporate mechanisms to address uncertainty; 2) detailed requirements for the EIA process phases should be made clear; 3) mechanisms are needed to ensure that the EIA influences decision making; and, 4) the EIA process requires substantial input and involvement from the regulator.

1. Introduction

Environmental Impact Assessment (EIA) is a key aspect of the planning and environmental management of commercial and industrial projects. The process is used to anticipate, assess and reduce environmental and social risks of a project prior to planning permission or regulatory approval being granted. As such, it is an important point for communication between the proponent, the regulator and stakeholders [1]. It is also often required to secure funding [2].

EIA is also an important mechanism for the International Seabed Authority (ISA), the body governing deep-sea mining (DSM) at the seabed in areas beyond national jurisdiction (‘the Area’). Through EIA, the ISA and its member states can operationalise several of their key obligations, such as applying the precautionary approach [3–5, paragraphs 131–132 in 6] and ensuring effective protection of the marine

environment from harmful effects of DSM, as required by the United Nations Convention on the Law of the Sea (UNCLOS) (Part XI Article 145 [7]). Part XI Article 145 in the EIA process allows identification and mitigation of such harmful effects to facilitate environmental protection.

There is a general consensus on the need for EIA in discussions on environmental protection in the Area across multiple stakeholders, including contractors, industry, intergovernmental organizations, scientists, lawyers and the ISA [8,9]. Moreover, EIA is an independent direct obligation of states under Article 206 of UNCLOS, and the Seabed Disputes Chamber confirmed EIA to be a specific requirement of the sponsoring states’ obligation of due diligence in relation to DSM [10,11]. The EIA process should enable the ISA to ensure that uniform and consistently high environmental standards are applied to all contractors. However, the legal instruments requiring states and

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contractors to undertake EIA are still incomplete, notably lacking a global detailed legally-binding requirement and mechanisms for supervision, compliance and enforcement [12].

This article examines the use of EIA as a tool for environmental protection and management in the context of DSM, drawing upon the application of EIA from allied industries. It concentrates on the EIA process, rather than on the technical aspects of preparing an EIA, which are covered in more detail for DSM by others [e.g. 13–15]. The existing requirements of EIA for DSM [3 Reg. 31(6), 4 Reg. 31(6), 5 Reg. 33(6), 16] contain little detail on its contents, and expansion of the appropriate contents has been proposed [17]; both are critiqued [18]. This article first discusses a number of key concepts relevant to the EIA process, and describes the existing regulatory framework, before outlining the ideal EIA process for DSM incorporating these concepts. It then describes some lessons learned from previous applications of EIA in related situations, and finally summarises the main challenges in implementing this EIA process for DSM under the current regulations.

2. Key Concepts: Uncertainty, the precautionary approach and adaptive management

A high degree of uncertainty exists in all aspects of the environmental management of DSM projects: a lack of environmental understanding at all spatial and temporal scales; mining and support technologies that are still under development; and environmental regulations that are still in draft form. Two key concepts have been identified to address this uncertainty: the precautionary approach [19] and adaptive management [20]. The precautionary approach is particularly relevant to EIA. In general, conducting an EIA is an element of operationalising the precautionary approach (19 chapter 5.4.1.2) and the precautionary approach should be applied at all stages of the EIA process, when evaluating predicted risks and selecting the best environmental practice(s) (BEP) as required by the ISA exploration regulations [3 Reg. 31(6), 4 Reg. 31(6), 5 Reg. 33(6) 16]. Thus, a precautionary approach is also vital to the practical implementation of an EIA.

Adaptive management, both active and passive [21], has been suggested as a mechanism for altering a DSM project to address uncertainties [e.g. [22,23–25]]. Adaptive management is a deliberate process of staging an activity with planned monitoring, followed by a review of the monitoring results to improve understanding of the environmental impacts of the activity and the re-evaluation and alteration of the activity for the future [20]. To successfully apply adaptive management, sufficient points for investigation, review of findings, decision-making and implementation of changes are required in the management process. Adaptive management-related decision making could be applied to EIA at similar points to the precautionary approach [26], where there are uncertainties about the potential impacts of a proposed activity. Active adaptive management would require the implementation of experimentation in advance to gather data to inform the EIA, based on preliminary findings. Alternatively, adaptive management has been included in other EIA processes as part of conditions imposed on consent, where an activity must be staged, monitored and reported on before a subsequent stage is undertaken, with specific actions based on the results identified in the EIA [27]. Both the precautionary approach and adaptive management should continue to be integrated into the environmental management of a DSM project through the refinement of the EIA during exploitation by the acquisition and review of monitoring data [26].

3. Existing regulatory framework for EIA in ‘the Area’

The ISA has adopted three sets of regulations for the exploration of different types of mineral deposits [3–5] and recommendations for EIA [16], together referred to as the ‘Mining Code’. The Recommendations are issued by the Legal and Technical Commission (LTC), an advisory

body made of experts that is the subsidiary organ to the ISA Council. Drafting of further regulations to be added to the Mining Code, specifically related to the environment and to exploitation activities, is ongoing [28].

Although the Mining Code is under development, it is possible to describe the current EIA process in the exploration regulations and its anticipated continuation into the exploitation phase. For the approval of a plan of work for exploration, in view of being awarded an exploration contract, an applicant needs to submit to the ISA documentation that includes:

- “(a) A general description and a schedule of the proposed exploration programme, including the programme of activities for the immediate five-year period, such as studies to be undertaken in respect of the environmental, technical, economic and other appropriate factors that must be taken into account in exploration;
- (b) A description of the programme for oceanographic and environmental baseline studies [...] that would enable an assessment of the potential environmental impact, including, but not restricted to, the impact on biodiversity, of the proposed exploration activities, taking into account any recommendations issued by the LTC;
- (c) A preliminary assessment of the possible impact of the proposed activities on the marine environment;
- (d) A description of proposed measures for the prevention, reduction and control of [...] possible impacts, to the marine environment;” [3 Reg. 18, 4 Reg. 20, 5 Reg. 20].

These requirements allow the applicant and future contractor to prepare for the next step in the process, the submission of an EIA prior to the commencement of exploration activities (‘prior EIA’) that were identified as potentially harmful, or that are scoped in by the LTC recommendations [3 Reg. 32, 4 Reg. 34, 5 Reg. 34, 16 § IV, B]. This includes, for instance, the testing of collection systems or equipment, which is an activity pertaining to the exploration phase of DSM in the Area. However, the requirement of conducting a prior EIA in the context of exploration activities in the Area should not be seen as the complete EIA process, but rather as a step in a broader process. Indeed, the milestone of the prior EIA is not followed by a decision-making step, but is part of the requirement to conduct environmental baselines and monitoring studies and to report on them to the ISA [3 Reg. 32, 4 Reg. 34, 5 Reg. 34]. As such, it forms part of the preparation work to refine impact prediction, to evaluate their significance, and to design appropriate prevention, mitigation and management models for the commercial exploitation activities that might follow an exploration contract [16 § IV, B]. While some key steps appear to correspond to the selection of BEP in an EIA process, the existing regulations present only a portion of a robust EIA process, as we discuss below.

4. The ideal EIA process

The context for the EIA will be set by policy preferably augmented by strategic environmental objectives and actions, both of which should be produced by the regulator [29]. The specific environmental goals for the project should be set out by the proponent in line with those in the existing policy and strategic plans. The ISA, sponsoring state, and the contractor all have roles to play in the development of environmental goals for a project. The contractor’s internal environmental policies, which may be documented as part of its environmental management system, provide further context for the EIA, including environmental aims and objectives, responsibilities, procedures, resources, policies, and targets [17,30]. Additional specific targets, such as environmental limits or thresholds, should be provided by the regulator in line with the environmental objectives [18].

An EIA is one component of the environmental management for a project, and fits in the appraisal phase within the larger framework of management activities [26]. The EIA should be undertaken once an

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