



上海交通大学
SHANGHAI JIAO TONG UNIVERSITY



ADAPTIVE MANAGEMENT: with a strict approach and a broader concept

XUE Guifang (**Julia**)

Chair Professor, KoGuan Law School
Director

Center for Rule of Ocean Law Studies
Center for Polar and Deep Ocean Development
Shanghai Jiao Tong University



Center for Polar and Deep Ocean Development, **SJTU**

- ④ A multi-disciplinary research institute focusing on law and policy issues related to polar and deep sea
- ④ Established in 2013 to meet the demand for policy support and consultancy to relevant agencies
- ④ **Projects conducted/conducting on DSM:**
 - Drafting the 13th 5-Year Plan on Resource Exploration and Exploitation of International Seabed Area
 - The Design of Implementation Regulations of DSM Law of PRC (based on an interpretation of the legislation)
 - Studies on ISA Periodic Review Mechanism of Resource Exploitation of International Seabed Area



Prof Craig's Discussion Paper

Comprehensive and informative with a rigorous structure

⦿ Introduction

- Background on Adaptive Management (AM)
- AM under DSM regime
- Challenges and key issues
 - Definition
 - **Application: When?** (uncertainty, controllability, and risk)
 - **Application: How** (connect with management interventions; operate across multiple instruments, project specific)
 - Balancing certainty and change

⦿ Options for deliberation and next steps



Evolution of Adaptive Management

- ⦿ Emerging in 2011:
- ⦿ Environmental Management Plan for the Clarion-Clipperton Zone (ISBA/17/LTC/7)
 - Para. 31: It should be noted that the **precautionary principle** applies to the exercise of **flexibility and adaptive environmental management**.



Evolution of Adaptive Management

Reiterated thereafter on many occasions:

- ⦿ 2014: Developing a Regulatory Framework for Mineral Exploitation in the Area (Stakeholder Engagement)
- ⦿ 2015: Developing a Regulatory Framework for Mineral Exploitation in the Area (Draft Framework for Regulation of exploitation Activities in the Area)
- ⦿ 2016: ISA Technical Study: No.16 Environmental Assessment and Management for Exploitation of Minerals in the Area
- ⦿ 2016: Working Draft Regulations and Standard Contract Terms on Exploitation for Mineral Resources in the Area
- ⦿ 2017: A Discussion Paper on the development and drafting of Regulations on Exploitation for Mineral Resources in the Area



Evolution of Adaptive Management

Context of DSM: Full of uncertainty and risks

⊗ Report of the Chair of the Legal and Technical Commission on the work of the Commission at its session in 2015

(**ISBA/21/C/16**), Annex III, Priority deliverables, item 5: **A key tool for environmental protection.**

⊗ Report of the Chair of the Legal and Technical Commission on the work of the Commission at its session in

2016 (**ISBA/22/C/17**), Annex II, Priority deliverables, item 5:

Prepare working definition and guidelines to assist the Authority in decision as to **whether adaptive management is appropriate for deep sea mining.**



Evolution of Adaptive Management

Background to the development of the working draft Environmental Regulations (Envo REGs)

4.1 The aim of the working draft is to address the following issues: (a) the prevention, reduction and control of pollution and other hazards to the marine environment, including the coastline, and of interference with the ecological balance of the marine environment, particular attention being paid to the need for protection from harmful effects of activities in the Area in accordance with best environmental practice, **adaptive management techniques** and the precautionary approach.



Evolution of Adaptive Management

Envo REGs:

⑦ 7.20 **Adaptive management** (as a tool for the application of precaution) is discussed briefly within the relevant section of the working draft but as yet, **no suggested regulatory wording.**

Adaptive management and its appropriateness / criteria for DSM activities, require a dedicated working group.



Evolution of Adaptive Management

Possible working structure for the “Envo REGs”

• **Draft Regulation 41:** Matters to be taken into account by the Commission

- The Commission, in considering an Applicant’s financial capability and technical capability and other matters prescribed by regulation 8 of the Exploitation Regulations, in particular that a Plan of Work provides for the effective protection of the Marine Environment, shall take account of the following in relation to an Evaluation of the adequacy of the Environmental Plans submitted as part of such Plan of Work and its implementation: -
 - (q) the use, where applicable, of **an Adaptive Management approach.**



Evolution of Adaptive Management

- **Draft Regulation 42:** Amendments and modifications of the Environmental Plans
 - Following the Commission's evaluation of the adequacy of the Environmental Plans, the Commission shall consider the following in connection regulation 41(w) above, unless such conditions have already been proposed by the Applicant and evaluated by the Commission:
 - (i) where applicable, conditions relating to an **Adaptive Management** approach under Part IX Section 1 to these Regulations.



Evolution of Adaptive Management

- **Draft Regulation 46:** Commission may obtain further advice
 - Where, in the Commission's reasonable opinion, there is a material difference of opinion concerning:
 - (c) the application of and criteria for **an Adaptive Management approach**, and such difference of opinion relates to an environmental component of an Application that is of key significance to the outcome of the Commission's Evaluation, the Commission shall refer the matter for an independent review under paragraph 1(d) above. The Commission shall be obliged to take into account the findings of the independent review in its Evaluation of the Plan of Work.



Evolution of Adaptive Management

- **Draft Regulation 49:** Substantive review of Environmental Performance
 - Within 6 months of the start of the 2nd, 5th and 10th years following the date of commencement of mining activities under an Exploitation Contract, or at such other times and intervals agreed with the Commission at the time of the Application, the Contractor shall submit a substantive review of its Environmental Performance in accordance with the Authority's guideline document. The review report shall contain the following minimum information:
 - g) where applicable, details of **Adaptive Management** measures taken in the light of new knowledge, information and experience.



Evolution of Adaptive Management

● Part IX: Environmental Management and Monitoring

● Section 1: Adaptive Management Approach

- Commentary: the application of **an adaptive management approach** was discussed at the Gold Coast workshop in May 2016 but no definitive conclusions as to its suitability and / or content reached. 58 AM requires a dedicated working group to explore the issues connected with its implementation. It would appear, as one generally accepted implementation of the precautionary approach and sound, good environmental management, that AM should be applied in a deep sea mining context. AM is one tool in combination with other environmental management responsibilities and practices anticipated under these regulations.



Evolution of Adaptive Management

Annex III: Format / Content of an Environmental Management and Monitoring Plan

⊙ **B. Environmental Management**

- **12. Adaptive Management:** requirements (process, procedure, response) for **adaptive management approach**, where applicable.

Schedule 1: Use of terms and scope

⊙ “**Adaptive Management**” is a planned and systematic process for continuously improving environmental management practices by learning about their outcomes. **Adaptive management** provides **flexibility** to identify and implement new Mitigation measures or to modify existing ones during the life of a mining project.



Challenges for AM Application

AM: advance approach but facing a variety of issues:

- ⊙ When will AM be applied (active) and the **criteria and triggers** (exceeding an environmental threshold? Unexpected adverse impacts)?
- ⊙ What level of information is needed and its **potential impact** on the **approval process** and on commercial mining operations, its **likelihood of success in mitigating environmental impacts**?
- ⊙ What are the **timeframes and reporting / approval process** for AM responses?
- ⊙ What are the implications for the **Authority / contractors** with appropriate **regulation(s), principles and criteria** for the application of AM and related guidance.....



Adaptive Management: with a strict approach and a broader concept

- ④ DSM is deemed to face massive uncertainty; effort to reduce impact of mining activities on marine environment
- ④ **AM: Learning by doing followed by adaptation and adjustment to allow feasible and achievable objectives**
 - To leave certain flexibility to the parameters of enviro regs
 - To apply guidelines and standards at tentative or trial bases
 - To enhance monitoring to enviro impact of mining activities to allow better understanding to the whole system for improved management
- ④ **Careful selection on the items applicable to AM approach, but encourage great endeavor to apply the AM concept**



Adaptive Management: with a strict approach and a broader concept

- ④ No panacea, but **an approach under certain management conditions** and structured decision-making environments enables learning and improvement
- ④ A **multi-step cyclical process** and useful tool to include as part of the **broader environmental regulatory scheme**
- ④ Facts: Some information/management gaps cannot be simply filled by invoking AM approach
- ④ DSM: **Legal certainty with clear rules and standards**
 - The contractors (applicant/miners) require **investment certainty** due to the large capital investment for the proposed mining operations.



AM Approach and AM Concept

AM: Divide it into a **strict approach** and **broader concept**

⊙ AM approach:

- To emphasize a **structured decision-making and learning management process**

⊙ AM concept:

- To apply to a **broader range of matters relate to DSM** by both the regulators and contractors

⊙ To differentiate **input and output control** to ensure a “**two-way traffic**”, but towards the same **destination (communication and engagement)**



AM Approach and AM Concept

• **Active and Passive AM:**

- **Active AM: Intervention to reduce uncertainty and lower the risks, i.e. pilot mining test**
- **Passive AM: accept decisions** from “good” practice or past experiences (application of AM over **mining area and locations** in the “mining code”, adjustment of the parameters and criteria)

• **Essence:** to determine the problems and look for solutions in the implementation and operation system

• **Key:** to learn by doing **and adapt for ever better and new solution: Self-controlled and adjustable approach towards ever better management outcomes**



AM Approach: Structured decision-making and learning process



Application procedure

- Define the problems (**regulator and miner perspectives**)
- Identify objectives (**interaction with science and technology**)
- Formulate **evaluation criteria with agreed triggers (objective and transparent)**



3 basic elements for effective application:

- Suitable and feasible **objectives**
- Sensible and reliable **anticipation to the system and its operation**
- Capacity to ensure the **actual operation of the system** able to adjust towards the objectives



AM Concept

apply to a broader range of matters of DSM

Contractors: from R&D phase to exploitation stage

⊙ Plan and implement **pilot test mining** with **gradual depth** (1000-3000-6000 meters) and **scale etc.**, combined with **close monitoring and assessment of the enviro impact**

⊙ Develop and advance **monitoring methods and skills** to reduce the disturbance to marine environment

⊙ **Design of mining system (science and technology):**

- To **set the objectives to minimize and reduce** the disturbance and damage to the environment;
- To allow **adjustment and adaptation** for the **critical parameters and structures**

⊙ To use **new and enviro-friendly technologies**



Concluding Remarks

To apply for AM throughout DSM activities

⊙ AM approach

- Take caution to **avoid “side effects”** by combining **strict rules with general principles**
- Clarify **detailed rules/conditions** to emphasize **improved management outcomes** with **specific requirements and procedures**

⊙ AM concept

- Involve contractors by stimulating their **“self-control” incentives and desire/expectation for “better” outcome**
- Achieve a **collaborative and effective partnership** by **sharing the management and monitoring burden**



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Thank you for your attention!

