

Equity Interest Scheme in Polymetallic Nodules Deep Seabed Mining: The Positives and Negatives

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ABSTRACT

UNCLOS 1982 initially obliged all applicants to submit a reserved area when applying for exploration activities in the Area. Such provisions were derogated when the equity interest scheme was introduced in the exploration regulations for polymetallic sulphides and cobalt-rich ferromanganese crust. The applicant may choose to submit a reserved area or offer an equity interest in a joint venture with the Enterprise. There has been a push to implement the same policy for polymetallic nodule (PMN) explorations. Although this prospect has sparked much support and rejections, there have been no scholarly articles substantiating such alignment's positive and negative impacts. Applying the scheme for all three types of minerals may significantly impact the implementation of the common heritage of mankind principle in the Area. This article normatively assesses the prospect of incorporating the equity interest scheme into the PMN utilization regime to identify its advantages and disadvantages compared to the reserved area scheme. The study found that incorporating the equity interest scheme for PMN would be oriented to optimize the financial benefits. However, it would further compromise the access for developing countries.

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1. Introduction

The United Nations Convention on the Law of the Sea (hereinafter UNCLOS) 1982 ensured the developing countries' access to deep seabed mining in the Area by providing reserved areas (UNCLOS 1982, Annex III, Article 8).¹ Such access is vital in implementing the common heritage of mankind (hereinafter CHM) principle as adopted in UNCLOS 1982 to promote the involvement of developing states. The reserved area is specifically reserved for developing countries directly or through the Enterprise. The reserved area serves as a tool to ensure that the utilization will not be

¹ "The Area" as the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.

done only by wealthy nations who possess the capital and expertise by ensuring there will still be prospective sites for the developing countries in the future (Willaert, 2021, p. 131).

Deep seabed mining activities require massive capital investment and technological expertise; thus, special treatments must be given to developing countries, including by providing reserved areas (Guntrip, 2003, p. 2). The reserved area obligation has been implemented, and several reserved areas have been submitted to the International Seabed Authority (hereinafter ISA). The obligation has been enforced in the exploration regulations for polymetallic nodules (hereinafter PMN). The same obligation was also adopted in the exploration regulations for polymetallic sulphide (hereinafter PMS) and cobalt-rich ferromanganese crust (hereinafter CFC) in 2010 and 2012, respectively (ISA, 2010).² However, it is no longer the only option.

The exploration regulations for PMS and CFC introduced an alternative of submitting a reserved area, i.e., by offering an equity interest in a joint venture with the Enterprise (hereinafter equity interest scheme). The equity interest scheme impacts the implementation of a parallel system, which also affects the implementation of the CHM principle (Jaeckel et al., 2016, p. 198-204). Most applicants preferred this alternative option, as only one out of five CFC exploration applicants chose to contribute a reserved area (ISA 2019). Meanwhile, all seven PMS exploration applicants chose the equity interest scheme (ISA 2019).

There have also been attempts to incorporate the equity interest scheme in the PMN exploration regime. In 2013, ISA requested the Legal and Technical Commission (hereinafter LTC) to recommend applying the equity interest scheme option in all three exploration regimes (i.e., PMN, PMS, and CFC) (Dingwal, 2020, p. 142, In C. Banet (Ed.), *The Law of the Seabed*, p. 139-162)).³ This exemplifies some push also to implement the equity interest scheme into the PMN regime.

Should the reserved area obligation become optional in all exploration activities in the Area (i.e., for all three mineral types), the availability of reserved areas will be jeopardized. Any addition to the existing reserved area will be unlikely as the applicant would prefer the equity interest scheme as demonstrated in the PMS and CFC explorations. Despite this, the question then is whether the reserved area is still vital for the developing countries?

The development of the discourses to apply the equity interest scheme for PMN minerals raises the urgency to re-evaluate the reserved area's relevance critically. Several changes within the international community and the deep seabed mining industry may affect the relevance of the policies adopted in the UNCLOS 1982. After

² ISA, "Decision of the Assembly of the International Seabed Authority relating to the regulations on prospecting and exploration for polymetallic sulphides in the Area," ISBA/16/A/12/Rev.1, 15 November 2010 (hereinafter exploration regulation PMS); ISA, "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," ISBA/18/A/11, 22 October 2012 (hereinafter exploration regulation CFC).

³ In *The Law of the Seabed*, ed. Catherine Banet (Leiden: Brill Nijhoff, 2020), 142; see also International Seabed Authority, "Report of the Chair of the Legal and Technical Commission on the Work of the Commission at the First Part of Its Twenty-Fourth Session," 2018, para. 18; International Seabed Authority, "Issue Related to the Possible Alignment of the Authority's Regulations on Prospecting and Exploration Concerning the Offer of an Equity Interest in Joint Venture Arrangement," 2018, para. 1.

almost 40 years since UNCLOS 1982 entered into force, there have been quite significant changes in developing countries' conditions and the practices reflecting the relevance of policies in place.

Despite the urgency, the issue has only received little attention among scholars. The authors have not found any scholarly work that explicitly addresses the prospect of applying the equity interest scheme for PMN. One of the works that addressed the topic of equity interest is an article by A. Jaeckel, J.A. Ardron, and K.M. Gjerde in 2016 titled "Sharing Benefits of the Common Heritage of Mankind – Is the Deep Seabed Mining Regime Ready?" (Jaeckel et al., 2016, p. 201). The article mentioned the issue that the equity interest can generate better financial input at the cost of sacrificing access for developing countries. However, other aspects need to be taken into account to holistically re-evaluate the prospect of applying the equity interest scheme for PMN.

In this article, the authors will not engage on the issue of whether the equity interest scheme is justified to be applied for PMS and CFC. This article focuses more on identifying the advantages and disadvantages of applying an equity interest scheme compared to the reserved area in bringing the optimal benefits for mankind. This article tries to analyze whether it is still relevant to preserve the reserved area policy as it is for PMN.

The research questions of this research are as follows:

1. How is the equity interest scheme being implemented as an alternative to the reserved area?
2. What are the advantages and disadvantages of applying the equity interest scheme for PMN?

2. Method

This normative research analyzed the issues based on the relevant legal norms and their implications. This research analyzed the significance and the relevance of reserved areas compared to the equity interest scheme in the utilization of PMN minerals in the Area. The arguments are linked to the fulfillment of the CHM principle to bring the optimum benefits for mankind. A qualitative analysis approach was used to find the norms relevant to the topic. This research used secondary data comprising of primary and secondary legal materials. The primary legal materials consist of the relevant international legal instruments governing the utilization of the Area, i.e., UNCLOS 1982 and its implementing regulations issued by the ISA. The secondary legal materials consist of journal articles, books, and other scholarly works relevant to this research topic.

3. Analysis and Results

3.1. The Application of the Equity Interest Scheme in Deep Seabed Mining as An Alternative to Reserved Area under UNCLOS 1982

Before arriving at the application of the equity interest scheme, we must first understand the background of the reserved area obligation. UNCLOS 1982 initially obliged every contractor to provide to the ISA a reserved area when applying for

exploration work in the Area (UNCLOS 1982, Annex III, Article 8). The reserved area is reserved for utilization by Enterprise or developing countries (Arrow, 1982, p. 56). The reserved area guarantees that developed countries do not dominate the Area's resources utilization by ensuring participation for developing countries (Egede, 2009, p. 688; Nandan & Lodge, 2002, p. 40).

Ensuring access becomes vital considering the barriers for developing countries to enter. Deep seabed mining activities demand a substantial investment and sophisticated technology (Guntrip, 2003, p. 2), thus there needs to be a special quota for developing countries to safeguard their future participation. The reserved area obligation has been adopted into exploration regulation for PMN. The policy has also been adopted into exploration regulations for PMS and CFC, although it is not the only available option.

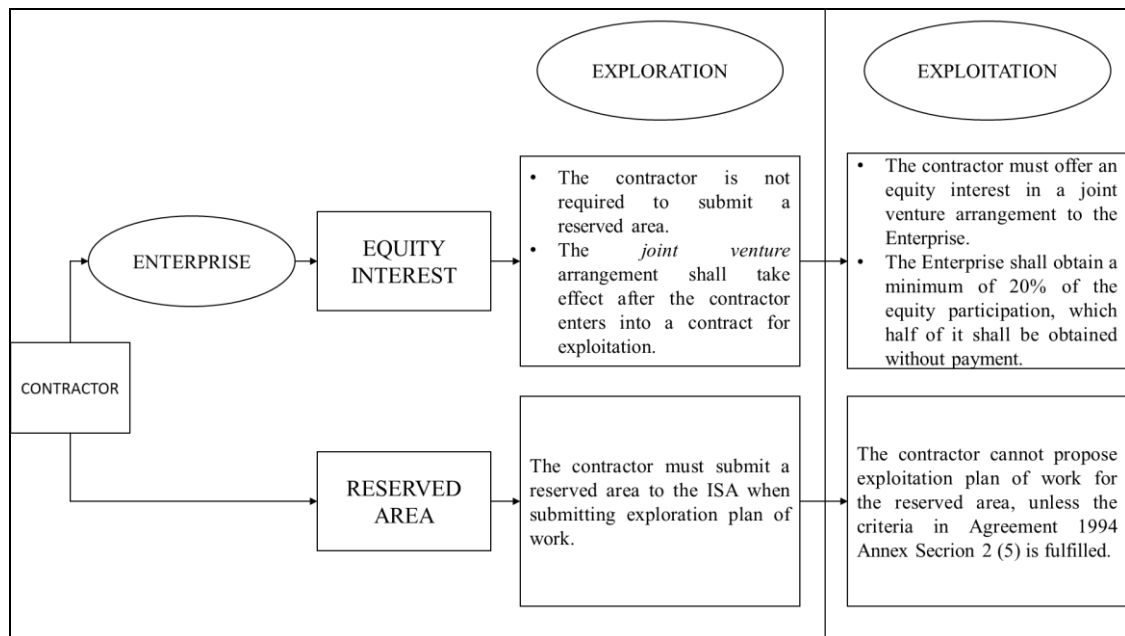
The imposition of reserved area obligation is a safeguard mechanism in applying the parallel system that allows national and private entities to utilize the Area's resources (US Department of State Bulletin, 1976). Article 153 of UNCLOS 1982 stipulated that the Area utilization activities are open for the Enterprise, state, or the entities within a state (UNCLOS 1982, Article 153 (2)). Although the utilization is open, the reserved area ensures that the Enterprise and developing countries can have access. Annex III Article 9 stipulated that the Enterprise is given priority to decide whether or not to utilize a reserved area before it is given to an interested developing country.

Every exploration applicant is required to submit a working site (excluding the Enterprise and developing countries applying for a reserved area) that is sufficient for two mining operations, divided equally according to the prospected economic value. The applicant decides at which point the two sites can be divided and have an equivalent economic value (UNCLOS 1982, Annex III, Article 8.). The applicants must submit all data of the two sites to ISA, including the mapping, sample, nodule volume, and the type of mineral. The ISA then will decide which one of the two sites will be the reserved area (UNCLOS 1982, Annex III, Article 8.). The reserved area has been prospected to ensure the mineral contents and the estimated commercial value. Therefore, the Enterprise and the developing countries utilizing them can directly enter into the exploration phase.

The technical provisions regarding the reserved area have been regulated in the exploration regulations issued by the ISA. The exploration regulations consist of three separate instruments, i.e., for PMN, PMS, and CFC. However, there is a special provision in the PMS and CFC exploration regulations. The applicants for those two mineral types are given an alternative option to the reserved area obligation. When applying for exploration activities, the applicant must choose whether to (a) contribute a reserved area; or (b) to offer an equity interest in a joint venture with the Enterprise (Exploration regulation PMS, at Regulation 16; Exploration regulation CFC, at Regulation 16). Should the applicant choose the latter, the joint venture is only established after entering the exploitation phase (Exploration regulation PMS, at Regulation 19 (2a); Exploration regulation CFC, at Regulation 19 (2a)). The difference between the equity interest scheme and the reserved area is illustrated in Figure 1.

Figure 1.

Comparison between equity interest scheme and reserved area



Source: authors' archive

In the equity interest scheme, the Enterprise is guaranteed a minimum of 20% equity participation, half of which is obtained without payment to the applicant (Exploration regulation PMS, at Regulation 19 (2a); Exploration regulation CFC, at Regulation 19 (2a)). The Enterprise's equity participation must be treated *pari passu* (equally treated) with the rest of the equity participation. The remainder of the equity participation shall also be treated *pari passu*, except that the Enterprise shall not receive any profit distribution from such equity participation until the applicant has recovered its total equity participation in the joint venture arrangement (Exploration regulation PMS, at Regulation 19 (2a); Exploration regulation CFC, at Regulation 19 (2a)). Despite the minimum threshold, the Enterprise is allowed to obtain (by purchasing) up to 50% of the equity participation. Although, there is no provision detailing how this equal treatment is going to manifest (Exploration regulation PMS, at Regulation 19 (2a); Exploration regulation CFC, at Regulation 19 (2a)).⁴

Unless otherwise agreed in the agreement with the applicant, the Enterprise shall not be obligated to provide funds or issue guarantees or accept any financial liability by reason of its equity participation, nor shall it be required to subscribe for additional equity participation to maintain its proportionate participation (Exploration regulation PMS, at Regulation 19 (2c); exploration regulation PMS, at Regulation 19 (2c)). Therefore, the equity participation percentage of the Enterprise is constant (i.e., minimum 20%), regardless

⁴ In the exploration regulations for PMS and CFC (respectively), Regulation 19 (2a) stipulated that the terms and conditions upon which such equality participation may be obtained would need to be further elaborated.

of any additional equity issuance in the joint venture (does not allow equity dilution owned by the Enterprise).

The provisions regulating the equity interest are still minimum and only found in the exploration regulations both for PMS and CFC. The ISA is yet to issue the guideline for implementing the equity interest scheme, particularly regarding the rights and obligations for the Enterprise. The absence of such guidelines is also linked with the absence of exploitation regulation. The equity interest scheme falls within the exploitation phase, thus we may expect the detailed provision to be found in the exploitation regulation. Although, the current draft regulation does not regulate the implementation of equity interest scheme (ISA, 2019).

UNCLOS 1982 and the 1994 Agreement on the Implementation of Part XI of the UN Convention on the Law of the Sea (hereinafter IA 1994) do not regulate the exemption of the reserved area obligation for any type of minerals. The mineral types of PMS and CFC were yet to be recognized during the drafting of the convention. The equity interest scheme was introduced in response to the difficulty to implement the reserved area obligation for the two mineral types. In 1998, the Russian delegations brought up the issue of mineral types other than PMN found in the deep seabed (i.e., PMS and CFC) to the ISA (ISA, 2001, p. 1, para. 1). The ISA then conducted a workshop in June 2000 to address the new findings to acquire information regarding the economic, technical prospects of minerals other than PMN found in the deep seabed (ISA, 2001, p. 1, para. 3). One of the issues addressed was the prospect of applying the reserved area obligation for the two mineral types.

The equity interest scheme was introduced in response to the technical difficulties in dividing a working area into two with equivalent economical value (ISA, 2001, p. 4, para. 12). The PMS and CFC have different characteristics to that of PMN, i.e., they are three-dimensional. This different characteristic would make it almost impossible for an applicant to assess the economical value during prospecting (ISA, 2001, p. 4, para. 12). The quality of minerals may differ from one spot to another, making it more difficult to divide based on economic value (ISA, 2001, p. 4, para. 12). The applicant would have to engage in an activity equivalent to that of exploration to assess the economical value.

The significant difference in applying the reserved area obligation for PMS and CFC pushed for the equity interest scheme as the substitution (ISA, 2001, pp. 6-7, para. 24-25). After all, the negotiation of the UNCLOS 1982 did not consider the existence of PMS and CFC minerals in mind. The negotiation of Part XI UNCLOS 1982 was based upon several assumptions regarding the expected scale of seabed mining operations for PMN (ISA, 2001, p. 4, para. 11). These assumptions related to the prices of PMN minerals, technical feasibility, and the need to ensure an adequate rate of return on investment and resulted in a model which required each mine site to generate an annual commercial production of three million tons of dry nodules per year over a period of 20 years (ISA, 2001, p. 4, para. 11). These assumptions do not apply to PMS and CFC due to the different mineral characteristics (ISA, 2001, p. 4, para. 11).

The participants in the ISA's workshop viewed that the site-banking system is not applicable for PMS and CFC (ISA, 2001, p. 4, para. 11). In response to the issue, another option was suggested to require the contractor to offer a joint venture with the Enterprise subject to certain specified terms and conditions (ISA, 2001, p. 4, para. 12). The participation of the ISA (through the Enterprise) was considered a mechanism to avoid

monopolization and ensure participation by the international community (ISA, 2001, p. 4, para. 12).

In addition, the difficulty to fulfil the reserved area obligation would negatively impact the interest of the potential applicant. Attracting investors to carry out activities in the Area rather than in national jurisdiction is a vital aspect considered by the ISA (ISA, 2001, pp. 4-5, para. 13). The fact that PMS and CFC are also abundant in the national jurisdiction would mean that the international regime must be competing with the national regime (ISA, 2001, p. 5, para. 14). Therefore, the issue in fulfilling the site-banking obligation may deter the potential applicant from engaging PMS and CFC mining in the Area (ISA, 2001, p. 5, para. 14). Whereas, the national regime may offer more favorable provisions that are more lenient than that of the reserved area obligation (ISA, 2001, p. 5, para. 14).

The more utilization activities carried out in the Area, the more substantial the benefits for mankind. UNCLOS 1982 also demand that the ISA promote the development of the resources in the Area (UNCLOS 1982, Article 150 (a)). The development of the resources can only be attained if there are utilization activities, such as prospecting, exploration, exploitation, and scientific research. Therefore, the regime regulating the exploration activities for PMS and CFC must not discourage such various activities to take place to begin with. In this context, the application of the reserved area scheme (without alternative) would discourage the activities in relating to PMS and CFC utilization.

The report from the LTC explained that the exploration activities for PMS and CFC would be more challenging compared to ones for PMN. LTC elaborated that the PMS exploration relies on the availability of "state of the art multi-purpose research vessels" to efficiently cover a vast area and require sophisticated technology to map the seafloor up to a depth of a few thousand meters (UNCLOS 1982, Article 150 (a)).

Considering that the rationale for applying the equity interest scheme for PMS and CFC is technical (i.e., the difficulty to apply site-banking system), therefore the same rationale cannot be applied for PMN. However, there have been attempts to also incorporate the equity interest scheme for PMN. In 2013 the ISA Council requested the LTC to provide recommendations on the application of the equity interest scheme option for PMN (ISA, 2013, para. 6). However, the LTC decided to postpone the discussion on the issue (ISA, 2018, p. 1, para. 2).

The equity interest scheme has yet to be implemented for PMN. We may assume that the LTC refused to recommend the incorporation of the equity interest scheme since the rationale that applies for PMS and CFC does not apply in the context of PMN. After all, UNCLOS 1982 already considered the implementation of reserved area obligation in the context of PMN. However, the authors believe that a further and more holistic approach needs to be taken to consider the pros and cons of applying the equity interest scheme for PMN. This analysis is necessary to better understand which scenario would better ensure the optimal implementation of the CHM principle.

The imposition of certain obligations to the applicant during the exploration and exploitation stages is related to the application of equitable benefits sharing. These obligations (including to submit a reserved area) are an attempt to create benefits for mankind, directly or indirectly. The CHM principle does not limit its operationalization into certain specific policies to bring benefits for all mankind. Therefore, there are some degrees of flexibility for the drafters to tailor policies to

ensure benefits for all mankind. There are several provisions in UNCLOS 1982 aiming to achieve the benefits for all mankind, i.e., reserved area, technology transfer (UNCLOS 1982, Article 155.), marine scientific research (UNCLOS 1982, Article 154.), and the redistribution of benefits (payment from contractors and redistribution by ISA) (UNCLOS 1982, Article 140.).

In the context of equity interest scheme, as long as it generates benefits for all mankind, its application should still be in line with the implementation of the CHM principle. Especially in the context of PMS and CFC exploration, the equity interest scheme is required to allow optimum implementation of benefits sharing (ISA, 2001, p. 5, para. 14).

The identification of advantages and disadvantages in this research is not intended to determine which of the two policies is better. The implementation of the equity interest scheme, in this case, is similar to that of PMS and CFC (i.e., as an option). This identification is necessary to evaluate whether the perception that the reserved area brings more benefit for all mankind is still relevant.

The policies implemented under UNCLOS 1982 are specifically designed in the context of applying CHM under the international law of the sea. In other sectors, the implementation of the CHM principle may vary. The different policies approach in different sectors affirm that the CHM principle may be operationalized with various policies. The reason for this may be linked with the absence of any definition, scope, and operationalization of the CHM principle agreed upon by the international community. Therefore, the flexibility in implementing the CHM principle can go as far as agreed upon by the states.

As an example, the CHM principle is also applied in the context of Antarctic utilization. In this case, the CHM principle manifests in the prohibition to all states to conduct commercial utilization of the natural resources found in the Antarctic.⁵ The benefits to be enjoyed by all mankind is not in the form of economic and financial benefits, but rather in the form of knowledge.

Another variation in implementing the CHM principle is in the context of outer space. The CHM operationalization principle in this context is still scarce, although in some aspects it is quite similar to the operationalization in the Area, there are also some specific provisions. For example, the current regime still does not regulate commercial exploitation activities in outer space.⁶ The absence of such provisions may be linked with the lack of systemic utilization therefore the provisions only currently only govern the exploration activities.

The different manifestations of CHM principles in the context of the deep seabed (Area), the Antarctic, and outer space indicated that the operationalization is not limited only to certain policies. The emergence of the equity interest scheme may also be evidence of the flexibility of applying the CHM principle. Therefore, the same normative justification for applying the equity interest scheme for PMS and CFC should also be applicable for PMN. The relevant question to be asked then is whether the implementation of the equity interest scheme for PMN will also optimize the benefits for mankind.

⁵ Protocol on Environmental Protection to the Antarctic Treaty 1991 governed the prohibition of exploitation activities of minerals other than for research purposes.

⁶ In *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty) 1967*, Article 1.

The authors have identified several advantages and disadvantages in applying the equity interest scheme for PMN compared to the reserved area. But firstly, we must understand that both policies have different benefits orientations. The equity interest scheme is oriented to generate a more optimum financial benefit. Whereas the reserved area is oriented to provide access for developing countries, therefore providing other economic benefits (i.e., less cost to conduct activities and securing prospective sites). This article will not engage in the discussion of which one of the two goals is more important or should be prioritized. The analysis will be based on the efficacy of each scheme in achieving its goal.

3.2. General Issues Relating to the Reserved Area Scheme Implementation

This subsection will elaborate the issues in the application of reserved area scheme in general, irrespective of the types of the minerals. The identifications would serve as the argument to support the incorporation of the equity interest scheme to avoid or resolve such issues. The advantage of the equity interest scheme stemmed from the inefficiency of the reserved area in achieving its goal. However, the identification of problems relating to reserved area scheme in this subsection is not an argument abolish to its application entirely. Instead, they serve to identify whether the incorporation of equity interest scheme as a viable option for contractors would resolve the issue of relying solely on the reserved area scheme, as per implemented for PMS and CFC. The issues relating to the reserved area scheme application and the comparative advantages offered by the equity interest scheme are elaborated as follow.

3.2.1 Sub-optimal utilization of the reserved areas

The sub-optimal utilization of the reserved areas consists of three issues:

a. The limited capacity of the Enterprise to utilize the reserved area

The Enterprise is the main beneficiary of the reserved area. UNCLOS 1982 gives priority to the Enterprise to access the reserved area (UNCLOS 1982, Annex III, Article 9). Therefore, the capacity of the Enterprise to optimally utilize reserved areas becomes important to consider. This includes the technical and financial capacities of the Enterprise. A crucial aspect to ensure that the Enterprise can operate efficiently, it must have access to deep seabed mining technology (Yarn, 1984, p. 127). However, the IA 1994 revoked the provision in UNCLOS 1982 that oblige the applicants to transfer technology to the ISA or Enterprise. Instead, the Enterprise is required to obtain such technologies on its own based on market price (Li, 1994, p. 142).

The Enterprise is yet to be fully operationalized. The IA 1994 stipulated that the Enterprise will only be operationalized independently after one of the two prerequisites is fulfilled. The Enterprise will be operationalized fully when an exploitation work proposed by an entity other than the Enterprise has been granted or when a joint venture offer with the Enterprise has been accepted by the ISA Council (IA 1994, Sec 2 Para 2.). IA 1994 also requires the first operation of the Enterprise to be carried out in a joint venture. As long as the Enterprise has not been operated, it cannot utilize the reserved area. This fact only reinforces the argument that the reserved area has not been utilized optimally by the main beneficiary.

Among the issues faced by the Enterprise is relating to its source of funding and access to technology. IA 1994 revoked the obligation for states parties to fund the first mining operation of the Enterprise. It also modified the provisions regarding the transfer of

technology, as mentioned previously (Li, 1994, p. 142). The obligation to transfer technology for applicants was heavily contested by developed countries, particularly related to intellectual property rights (Willaert, 2021, p. 3; Moses & Brigham, 2021, p. 4; Bernaz & Pietropaoli, 2020, p. 1-21). Therefore, there are several issues needed to be solved to allow the Enterprise to operate efficiently after its full operationalization.

Even when the prerequisite set in the IA 1994 has been fulfilled, the issues regarding its capacity to conduct deep seabed mining would remain. The optimum benefits of having reserved areas are dependent on whether the Enterprise can utilize them. The utilization of the reserved area by the Enterprise is the most optimum due to the financial profits that the Enterprise can acquire, which then will be transferred to the ISA to be used for the benefits of all mankind. Although the utilizations by developing countries will still give benefits to them, the benefit for all mankind is comparatively less substantial (i.e., only royalty payment).

The availability of the reserved areas is not comparable to the capacity of the Enterprise to utilize them. The Enterprise cannot possibly utilize all the available reserved areas at any given time due to financial and technological constraints. In fact, after its initial operation, the Enterprise might only be able to (actively) manage one site at a time, although the number may increase as the Enterprise increases its financial and technical capacity over time. The rest of the reserved areas will either be utilized by developing countries directly or indirectly (through sponsorship). Therefore, the benefit for all mankind is less likely to be attained optimally.

Compared with the equity interest scheme, the Enterprise is guaranteed to be involved in the utilization activities (although only in the exploitation phase). Therefore, generating benefits for all mankind can become more optimal, especially relating to the financial profits that will either greatly improve the Enterprise capacity or will be redistributed by the ISA through the equitable benefits sharing mechanism. The low requirements for the Enterprise to be involved in a joint venture arrangement under an equity interest scheme will allow it to satisfy multiple offers at a time.

b. 'Misuse' by developed countries

Developing countries' participation during the exploration phase is important to allow them to become more than just passive beneficiaries of the CHM principle (through the equitable benefits sharing system), but also as actors directly involved in the activities (Wang, 1991, p. 134). As of 2012, seven exploration contracts have been issued for reserved areas. The contracts have been granted to Tonga, Nauru, Kiribati, Singapore, Cook Islands, China, and Jamaica (ISA, 2020). However, some of the applicants are owned and financed by foreign corporations headquartered in developed countries (despite being registered in developing countries). These applicants are using the status of the developing countries as a sponsor to access the reserved areas.

Under several practices of sponsorship scheme, the participation of the developing countries is diluted and does not generate the expected benefits such as expertise. The sponsorship by Tonga and Nauru are examples of misuse by developed countries. The applicants sponsored by Tonga and Nauru, respectively, are owned by Nautilus Inc., a Canadian seabed mining company.

We may suspect that these entities wanted sponsors from developing countries to gain access to reserved areas to minimize cost. Should this be the case, then the benefits reserved areas are not enjoyed by the developing countries themselves but rather by

entities from developed countries (UNCLOS 1982, Article 139 (2)). The developing countries may still get some degree of benefits depending on the agreement in the sponsorship contract. However, the benefits enjoyed by the developing countries may not be that significant, considering they need to attract investors to utilize the sponsorship from their country. The developing countries may have to race to the bottom (i.e., competing with other developing countries) to get the investment from foreign entities (Olney, 2013, p. 191-203).

Even if these developing countries still get some degree of benefits, they are not shared with the entire mankind. The agreements between the applicants and their sponsoring state are confidential, therefore we may not know for certain how fair the distribution of the benefits is. In any scenario, these practices are harmful to the interest of mankind and contrary to the intention of enforcing the reserved area policy.

The trend of misusing the reserved area may push other developing countries to also conduct the same practice to safeguard their interest (i.e., securing investment and financial benefits sharing from foreign entities). These issues highlight the fact that not only the reserved area has not been utilized optimally, but also being misused. The equity interest scheme may minimize such issues. Under the equity interest scheme, the interest of all mankind is directly represented by the involvement of the Enterprise in the joint venture, thus eliminating the possibility of misuses.

c. Unsolved barriers to entry for developing countries

Even the existence of reserved areas cannot solve the obstacle for most developing countries to conduct deep seabed mining, i.e., capital, technology, and expertise. For them to engage in deep seabed mining activities, they will still be required to possess substantial capital and sophisticated technology. Although most exploration contracts are granted for developing countries (with China holding five contracts), they are not reflecting the vast majority of developing countries. Several representations of developing countries are under sponsorship scheme, while some other developing countries are substantially more advanced (i.e., China and Singapore).

According to proposals from applicants, the capital and operational expenditure of one mining site is approximately USD 11.90 billion (Sharma, 2011, p. 10-11). Most of the expenses are incurred from operational expenditure until the end of the 20 years of exploitation (up to USD 10 billion). Therefore, the capital requirement will still be a substantial obstacle for developing countries' participation even when they skip the prospecting stage (Abramowski et al, 2021, p. 10; Teague & Scott, 2017, p. 100-112).

The demand for substantial capital and sophisticated technology will still be obstacles for developing countries despite being given access to the reserved area. This issue may also be relevant in the case of the Enterprise. Therefore, the benefits offered by the reserved area may not be as accessible as it seems. The less able the developing countries and Enterprise to optimally utilize the reserved area, the fewer benefits generated by the policy.

The issue of accessibility is prevalent in the current practice of developing countries that prefer to use the sponsorship system instead. Despite having access to the reserved area, they prefer to allow entities owned by developed countries to utilize it to get a fraction of the benefits. This shows that the existence of reserved areas alone is not enough to facilitate the vast majority of developing countries to access the Area.

Moreover, the substantial investment may not be suitable for developing countries that have a comparatively lesser financial capacity to engage in such high-risk industries.

In the economic globalization era, countries must operate efficiently and have comparative advantages (Salvatore, 2004, p. 1-20). In this case, for developing countries to invest in deep seabed mining may not be efficient, considering they have very limited capital and may not possess the necessary technology yet. If they engage in deep seabed mining inefficiently, the prices of the minerals recovered may not be as competitive as those recovered by the developed countries that can operate more efficiently. However, this is not an argument against any participation of developing countries but rather to identify their tendency to likely avoid the deep seabed mining with their investment.

3.2.2 The reserved area obligation is burdensome to prospective applicants

The reserved area obligation may deter the prospective applicants from engaging in the Area utilization due to the additional upfront cost (i.e., to conduct prospecting). In comparison, the equity interest scheme allows the applicant to be more efficient by not imposing any additional burden during the exploration stage. This advantage is also relevant for developing countries who are interested in conducting activities outside of the reserved area, considering the reserved area obligation is also applied for them.

The fact that only one out of 12 explorations applicant for PMS and CFC combined chose to contribute to reserved area shows that the equity interest scheme is preferable (ISA, 2019). The same level of preference may not be reflected in the case of PMN because there is also the issue of difficulty to divide an area into two for PMS and CFC. However, the flexibility for the applicants to choose may be vital to allow them to assess which scenario best fits their situation. Considering they are not granted any rights during the prospecting stage; some applicants may prefer to opt into the equity interest scheme instead to minimize the upfront cost. Therefore, applying the equity interest scheme as an option may accelerate the number of activities in the Area, which would optimize the benefits for all mankind from profit sharing.

3.2.3 The insignificant contribution of the reserved area in providing access to developing countries

The function of the reserved area in providing access to developing countries has not been significant. Despite several developing countries have been granted exploration contracts in the reserved area (excluding those sponsoring foreign-based entities), some are not really in need of the reserved area. These 'developing' countries include China and India. They are among a few developing countries that can utilize the Area with their investments, even India is among the pioneer investors.

The types of developing countries that able to utilize the reserved area independently (without sponsoring foreign-based national entities) are those that are financially and technologically more developed compared to the vast majority of other developing countries. These countries do not need a reserved area to engage in the deep seabed mining industry but still got the privilege due to their status as developing countries. This fact compromises the utility of the policy. The reserved area doesn't seem to play any role in allowing developing countries to engage in the Area utilization that otherwise would not be able to. The policy only seems to be helping the most developed developing countries that can do so regardless. This may as well be the

systematic weakness of the reserved area policy. This issue also extends to the issue of fair competition between applicants.

Considering the factual beneficiaries of the reserved area are only those most developed developing countries, giving them the privilege may not be fair for other applicants. Developing countries such as China, India, and Singapore may have a comparable capital and technological capacity to those of developed countries. Would it be fair to give them privilege over applicants from developed countries?

The difference between developing countries such as China with developed countries such as the United Kingdom or Canada is only a matter of label. Financially, they are on par. China even ranked second as the world's largest economy since 2010 (World Bank, 2019; Focus-Economic, 2021). After all, there is no universal standard in assessing whether a country is developed or developing. UNCLOS 1982 does not define the criteria of a country as a developing country to be given access to a reserved area. The fact that applicants from China and one sponsored by Singapore are given access to the reserved area only furthers the question regarding whether they are eligible for the privilege.

3.2.4 The function of the reserved area is attainable with another policy

The reserved area allows developing countries to access the Area with less cost and more certainty. Although, lowering the cost for developing countries may not be the most important part of the reserved area considering the remaining cost would still be very substantial for up to 15 years of exploration and up to 20 years of exploitation activities. Therefore, the only clear benefit of the reserved area is to safeguard the sites for future uses by the Enterprise or developing countries when they are more capable. However, can such intention be accommodated under different policies that are more effective and avoid the same issues as the current reserved area policy?

In order to avoid imposing a burden on the applicants, the authors would like to elaborate a consideration to adopt the similar approach used in determining Areas of Particular Environmental Interest (APEI) in the Area. The key difference here is that the site-banking obligation would not be imposed upon the applicants, but would be determined by the ISA. If the goal is to reserve several prospective sites for use by developing countries to allow them to enjoy the natural resources, this policy should be fit to replace the reserved area obligation.

The ISA has implemented the Regional Environmental Management Plans (REMPs) in Clarion-Clipperton Zone (CCZ). The REMPs for CCZ were adopted by the ISA Council in 2012 under the recommendation from the LTC (ISA, 2012, p. 2). The REMPs are approved to determine which parts of the Area hold significant environmental value (APEIs), thus should be excluded from utilization activities (ISA, 2011, p. 5). The APEIs are part of the Area that are considered to hold valuable biodiversity and ecosystem to be preserved. The nominations of parts of the Area to be determined as APEIs are done by the LTC under their research.

In this context, the authors would like to explore the possibility of determining the reserved areas with the same approach used to determine APEIs. As per for APEIs, the LTC may recommend which parts of the Area should be reserved for utilization by the Enterprise and developing countries. The idea is to shift the obligation from the applicants and ensure a more efficient approach to safeguard the interest of developing countries.

The same approach to determining APEIs may be relevant in determining reserved areas, although it may not be as accurate in determining the potential economic value in one given site. The approach would also be more challenging to be implemented for PMS and CFC considering the different nature of the resources. The application of such an approach is also dependent on the capacity of the LTC to conduct prospecting activities to determine which sites contain sufficient minerals to be reserved. After the Enterprise has been operationalized, it may also contribute to providing data to the LTC regarding the potential reserved area.

Despite the possible difficulties, the idea to determine reserved areas by the ISA should be considered. In essence, the approach tries to achieve the same objective as the reserved area policy but without imposing an additional burden on prospective applicants, with the aim to accelerate more utilization activities.

The nominations of parts of the Area to be reserved do not need to be done at once. In the context of the REMPs, the LTC may recommend additional APEIs in the CCZ following the feedback from the public and experts in workshops (ISA, 2021). This flexibility would allow the ISA to adjust the number of available reserved areas to ensure equitable opportunity between developed and developing countries.

3.3. Disadvantages of Implementing Equity Interest Scheme for PMN

The identification is closely related to the function of the reserved area that would be compromised with the introduction of an equity interest scheme as an option for the applicants. The identified disadvantages are as follow:

3.3.1 Compromising the opportunity for capacity building

Aside from securing sites for the Enterprise and developing countries, the reserved area has longer-term benefits. One of the absolute advantages of the reserved area is that the benefits are available since the exploration phase. Whereas the benefits of equity interest scheme are only during the exploitation phase when the applicants made joint venture arrangements with the Enterprise. The benefits offered by the reserved area are also extended beyond just financial benefits, but also non-financial benefits for the Enterprise and developing countries.

Optimum participation of developing countries during the exploration phase should also be considered as a benefit. The access for developing countries to engage in exploration activities will allow them to improve their capacity in the utilization of seabed (Snoussi & Awosika, 1998, p. 209-215). If the developing countries are eliminated since the exploration phase, they may never keep up with the developed countries in utilizing the Area (Egede, 2002, p. 689). Despite non-financial, such benefit should also be considered as a benefit for mankind.

The incorporation of an equity interest scheme in the PMN regime would negatively affect the availability of reserved areas in the future. Therefore, the access for developing countries to engage in the exploration phase will also be minimized. Applying the reserved area obligation absolutely (without alternative option), at least for PMN, will ensure access for developing countries to start building their capacity (Jaeckel et al., 2016, p. 198-200). The knowledge transfer is not exclusive only when the activity is conducted by a developing country, but also via the Enterprise.

Although the equity interest scheme can better guarantee more substantial financial benefits for all mankind, the scheme does not accommodate the need for developing

countries' participation. The financial benefits generated under the equity interest scheme do not improve the capacity of developing countries to conduct deep seabed mining, thus would lead to further domination by developed countries in the Area utilization. Allowing developing countries to enhance their capacity will allow them to also engage in the activities in the future.

3.3.2 Monopoly by developed countries

The absence of access for developing countries to engage in the Area utilization would lead to the monopoly by developed countries (Willaert, 2021, p. 6). Despite the number of developing countries capable of conducting utilization in the Area still low, this condition may improve as their economy grow and their expertise is increased, and the industry becomes more accessible with the advancement of technology.

Safeguarding the interest of developing countries in the long term should be considered in tailoring the policy in the Area. The future participation of developing countries may also be linked with fair distribution of economic benefits. Even though the developing countries are not capable at the moment, that does not mean the developed countries may deplete the common resource for their profits. Despite requiring substantial capital cost, deep seabed mining also promises a huge investment return. We must ensure that this potential financial gain should still be available for developing countries in the future.

The expected investment return from PMN exploitation is approximately USD 1.04 billion every year, totaling USD 20.85 billion in 20 years from a single site (Sharma, 2011, p. 28-41). This potential financial gain is still substantial compared to the required capital of USD 11.90 billion (Sharma, 2011, p. 28-41). Ideally, this financial gain should also be accessible for developing countries to improve their economies.

The function of the reserved area becomes vital when it comes to fair access to resources. The developing and developed countries do not share the same starting point in utilizing the Area. If the utilization regime does not reserve sites for the developing countries, the majority of the financial benefits from the Area will only be enjoyed by most developed countries. Even when the developing countries finally can conduct deep seabed mining, they may be left only with a few potential sites that contain enough resources for profitable utilization activities.

In terms of generating financial benefits for developing countries, the reserved area may be more optimal in the long run. Despite the proportion of benefits sharing between the applicants and mankind (via ISA) is yet to be determined (UNCLOS 1982, Annex III Article 13), we may assume that the applicant would get the majority of the profit anyway. The royalty paid by the applicant may be significantly less compared to the total production. We may use the provision for royalty system applied for deep seabed mining in the extended continental shelf as a reference, which puts the proportion for mankind at 7% of the total production at the maximum (UNCLOS 1982, Article 82).

The domination by developed countries would also mean the most financial benefits are enjoyed by them. Therefore, the equal opportunity to access the Area is a vital aspect to be preserved. Under the reserved area regime, it is guaranteed that 50% of the prospected resources are accessible only for the Enterprise and developing countries.

3.3.3 Lowering the privilege enjoyed by the Enterprise

One of the privileges enjoyed by the Enterprise is the prioritized access to the reserved area. Although, we must still acknowledge that the equity interest scheme will give a new privilege for the Enterprise as the joint venture partner. The compromise on the availability of the reserved area would also affect the efficiency of the Enterprise in conducting activities.

If the Enterprise can no longer rely on the availability of reserved areas, it must engage in risky and costly prospecting activities. This may not be ideal considering the Enterprise has limited capital that would be better utilized in the later stage of the activity. Although, the scenario where the reserved area is completely depleted is relatively low considering the Enterprise is given the right to decide (UNCLOS 1982, Annex III Article 9 (1)). Moreover, the limited capacity of the Enterprise may not allow it to engage in multiple operations at once, thus a few reserved area blocks may be sufficient. Despite this, the authors would like to highlight the issue of efficient operation of the Enterprise.

Considering its limited capital capacity, the Enterprise must operate efficiently by avoiding activities that are still too speculative such as prospecting activities. As an entity whose operations are financed by mankind, the utilization of capital should always ensure better returns. Therefore, it would be inefficient if the funding is utilized for prospecting activities. At least during the exploration and exploitation activities, the return is more promising and more tangible.

3.3.4 Uncertainty surrounding the equity interest scheme

The provisions regulating the equity interest scheme are very limited. As of now, the provisions can only be found in the exploration regulations for PMS and CFC. Considering the two regulations only regulate the exploration phase, the provisions regulating the equity interest scheme is very minimum. The scheme itself falls under the exploitation phase, considering the joint venture will only be established after the applicant applies for exploitation work (Exploration Regulation PMS; Exploration Regulation CFC). Despite this, the current draft of exploitation regulations does not regulate how the equity interest scheme should be implemented (ISA 2019).

Among the uncertainty surrounding the equity, the interest scheme is related to the role of the Enterprise within the joint venture arrangements. It is still unclear whether the Enterprise will or should play an active role in the joint venture or only act as a silent partner. If the Enterprise only acts as a silent partner, the benefits of technology knowledge transfer may not be achieved.

Considering the term used is 'minimum', this may indicate that the initial equity participation granted for the Enterprise may be more than 20% depending on the agreement between the parties. Therefore, the negotiation process should be vital, as it may determine whether the Enterprise only received the 20% with 10% being granted without payment or it may acquire more than 20% without payment entirely. Although, the likelihood for the applicant to offer more than 20% may be low considering the Enterprise may have little to nothing to offer.

Another issue is related to the negotiation of the initial equity participation granted for the Enterprise. The existing provision only provides that the Enterprise must hold a minimum of 20% of equity participation, with 10% being granted without payment.

This would mean that the remaining 10% must be purchased by the Enterprise just to attain the minimum threshold. This is quite confusing, considering the burden to satisfy the minimum requirement should be imposed on the applicants, not the Enterprise. Under the current regime, the Enterprise would be forced to buy the remaining 10% because otherwise the minimum requirement would not be met.

If the Enterprise fails to acquire the remaining 10% of the equity participation, would the joint venture arrangement still be feasible? Note that the term used to indicate the obligation for the applicant is "to offer" equity interest in a joint venture with the Enterprise. Despite this, the Enterprise does not seem to be given the right to refuse the offer. After all, if the Enterprise refuses the offer, would that mean the obligation for the applicants still has been fulfilled anyway, or should it be forced to take the other option (i.e., submitting a reserved area)? If the joint venture arrangement is meant to happen, then the Enterprise should not reject the offer. Considering there is a gap of up to 15 years between the applicant deciding to opt into the equity interest scheme and the commencement of the exploitation activities, when should the Enterprise decide whether to accept the offer?

The uncertainty surrounding the equity interest scheme would also compromise the benefits for all mankind. The absence of a comprehensive guideline regarding the implementation of the equity interest scheme makes it very risky to also be applied for PMN. However, this conclusion may change as the implementation aspects are developed as the discussion progresses.

3.4. Technical Feasibility of Implementing Equity Interest Scheme for PMN

The last issue that would be addressed is regarding the technical possibility of incorporating the equity interest scheme for PMN. Among the issues of applying the scheme for PMN is the fact that the exploration phase has started in the early 2000s, where the applicants must nominate to contribute to a reserved area. Whereas in the case of PMS and CFC, the exploration activities have not been started until the equity interest scheme was introduced. Considering the applicants must decide between the two options when entering the exploration phase, this would be an issue when incorporating the equity interest scheme for PMN. If the new regime only applies to future applicants, would it be fair for the existing applicants?

There is no clear and definitive answer to this issue. However, considering the existing applicants are privileged enough to have the capacity to conduct deep seabed mining even since the early 2000s, they should not be entitled to any compensation. Although should any compensation be deemed necessary, the ISA may consider giving them certain special rights as it did to the pioneer investors (Final Act of the Third United Nations Conference on the Law of the Sea). However, the form of the appropriate compensation is still subject to a specific discussion.

4. Conclusion

The equity interest scheme and reserved area each have their respective main objectives. The equity interest scheme is more oriented to accelerate the utilization activities in the Area to generate more financial benefits for mankind. Whereas the reserved area is more oriented to provide access for developing countries to improve their capacity. It would be complicated to assess which objective is more important

than the other. Therefore, the analysis should consider the efficacy of each scheme in achieving its respective main objective.

Each of the schemes has a comparative advantage and weakness over the other. The advantage of applying an equity interest scheme for PMN is related to the issues in implementing the reserved area scheme. The identified issues of reserved area are as follow: (1) the suboptimal utilization of reserved area, (2) burdening prospective applicant, (3) insignificant role in opening access, and (4) the goal is attainable with other policy. The equity interest may avoid these issues while ensuring more optimal financial benefits for mankind.

The disadvantages in applying the equity interest for PMN are related to the benefits of the reserved area that would be compromised. The identified disadvantages are as follows: (1) compromising the opportunity for capacity building, (2) monopoly by developed countries, (3) reducing the privilege enjoyed by the Enterprise, and (4) the uncertainty surrounding the equity interest scheme.

Considering the above identifications and elaborations, the decision on the issue is depending on the preference of the international community. If the financial benefit is prioritized, then applying the equity interest scheme for PMN will be the way to go. Conversely, if the access for and participation of the developing countries is more preferred, the reserved area obligation should be preserved as the only option for the PMN utilization applicants.

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