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The Mining Code for Prospecting Exploration and Exploitation in Maritime Domain: Experimenting the Regional Environmental Plans of ISA

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Abstract.

The Seabed Mining is a growing maritime industrial field that involves the extraction of submerged minerals and deposits from the ocean and over the years, there has been a rising demand for minerals and metals in various sectors of the Maritime Industry. This led to the creation of the International Seabed Authority of 1982 which is saddled with the responsibilities of regulating human activities on the deep-sea floor and the continental shelf. Despite the existence of the regulatory body, there are challenges that are present within the organs of the International Seabed Authority. These challenges include lack of transparency and also the impact of the deep seabed mining activities on the environment that still need to be extensively researched before deep seabed mining activities can commence in the World Maritime Economy. This research adopted a doctrinal method of research to collect data through the use of Law textbooks, articles in journals, and various online resources. The aim of this paper is to discuss the benefits of deep seabed mining, the regulatory frameworks of deep seabed mining, the impacts of deep seabed mining on the environment, deep seabed mining activities in Africa and Nigeria. It was concluded in this paper that before the deep seabed mining activities can commence, it is necessary that wide and extensive research be carried out on its effect on the environment, the various organs in International Seabed Authority should be more transparent on their activities to the public and African States particularly Nigeria should organise workshops to educate the Maritime Industry of various states about the involvement and participation of African countries in the deep seabed mining activities like their counterparts in other countries of the World.

1. Introduction

The word 'Seabed' was first used in 1838 and it generally means the floor of a sea or ocean.[1] The word 'Mining' on the other hand means the activity or process of searching through large amounts of information for a specific data or patterns.[2] A fusion of these definitions means that Seabed Mining is the process of searching the floor of the sea or ocean for specific resources found within the sea or ocean. The deep sea covers around 360 million km2 of the Earth's surface[3] and it represents 95% of the global biosphere in terms of inhabitable volume.[4] The implication of this is that sizeable number of the deep sea resources is still expecting human exploring and indeed this remains mystery to be discovered.[5]

The deep seabed mining involves extracting submerged mineral resources and deposits from the continental floor as well as the Area under the High Seas, being a developing and growing industrial field.[6] Arguably, no commercial scale deep sea mining has taken place based on research, although a range of mining operations are active in the shallow seabed.[7] Manganese Nodules (MN),[8]Seafloor Massive Sulfides (SMS)[9]and Cobalt-rich Crusts (CRC)[10]are the three main resources that are of interest in deep seabed mining.

Essentially, the demand for minerals and metals in many sectors is being continuous and rising over the years. This has however reawakening the resurgence of interest in the exploration of mineral resources located on the seabed. It has also led to the creation of the International Seabed Authority (ISA) in 1982. The ISA has been saddled with the responsibility of regulating human activities on the deep-seafloor (the Area)[11] and the continental shelf,[12] the common heritage of mankind and the management of seabed mining activities for the interest of mankind as a whole, with particular consideration for the benefits

[1]Merriam-Webster, https://www.merriam-webster.com/dictionary/seabed accessed on 23 October, 2021
[2]Ibid.
[3]Some authors have argued that oceans cover 70-71% of the earth's surface. See for examples, M. J Costello, Marine Biodiversity, Biogeography, Deep Sea Gradient, and Conservation available at https://www.cell.com accessed on 1st February, 2022, M. Diesing, Deep-sea Sediment of the Global Ocean-ESSD, available at http://essd.copernicus.orgaccessed on 1st February, 2022 among others.
[4] Kathryn A. Miller, Kirsten F. Thompson, Paul Johnston and David Santillo, *An Overview of Seabed Mining including the Current State of Development, Environmental Impacts and Knowledge Gaps*, (Frontiers in Marine Sciences 2018) vol. 4 p. 2.
[5]Ibid.
[6]Research Global, *Seabed Authority* https://oceanfdn.org/seabed-mining/ accessed on 23 October, 2021
[7]Kathryn A. Miller *supra,* p. 2.
[8]Comprises of manganese and iron which are usually found in the Pacific Ocean.
[9] These are hydrothermal vents which are found in the Coast of Papua New Guinea
[10] Found at seamounts worldwide.
[11]The Area is the seabed ocean floor and subsoil thereof, beyond the limits of national jurisdiction
[12]Ibid.

and needs of developing countries,[13] and the protection of the marine environment.[14]

2. Research Methods

This research adopted a doctrinal method of research to collect data through the use of Law textbooks, articles in journals, and various online resources. It has been observed there are still some governance and regulatory challenges within the organs of ISA. Despite the emergence of the International Seabed Authority as a regulatory body saddled with the responsibility of controlling and managing issues pertaining to deep seabed mining concerns, the issue of the effect of the deep seabed mining activities on the environment and the dearth of participation of African countries in the deep seabed mining activities. The aim of this paper therefore, is to discuss the historical development of the deep seabed mining concept, the benefits of deep seabed mining, the regulatory frameworks of deep seabed mining, the principle of common heritage to mankind, the impacts of deep seabed mining on the environment, deep seabed mining activities in Africa and Nigeria, the challenges of deep seabed mining activities and the recommendations on how these challenges can be solved effectively.

3. Result and Discussion

3.1. Deep Seabed Mining: It's Development

The concept or idea of seabed mining was first discussed in the 1960s, when John L. Mero postulated in his 1965 book 'Mineral Resources of the Sea' that manganese nodules grow quickly that the supply will be inexhaustible. These estimations however, have been proven to be incorrect as manganese nodules grow at a rate of just several mm to cm per a million years.[15] Although, this was first discussed in this period, it did not gain the expected recognition in the International economy until the early1970s when discussions to establish the United Nations Convention on the Law of the Sea (UNCLOS) as an International treaty to manage the seas.

In the 1970s and 1980s, interest in deep sea minerals was growing and seabed deposits were introduced as a limitless resource that would yield economic benefits to the global economy and as a result the UNCLOS 1982 came into existence and the eagerness and enthusiasm of exploiting marine resources by the

[13]Lisa A. Levin, Diva J. Amon and Hannah Lily, *Challenges to the Sustainability of Deep Seabed Mining* (Nature Sustainability 2020) p. 2.
[14]Aline J. Jaeckel, *The International Seabed Authority and the Precautionary Principle* (Leiden:Brill/Nijhoff 2017) p.632.
[15]Kirsten F.T, Kathryn A.M, Duncan Currie, Paul Johnston and David Santillo, *Seabed Mining and Approaches to Governance of the Deep Seabed* (Frontiers of Marine Science 2018) vol. 5 p 1

International Community for Seabed Authority resulted in Part XI of the UNCLOS.[16]

Generally, seabed activities are governed by the national jurisdiction of a state as the UNCLOS recognises rights and imposes obligations on nation states on areas within the national jurisdictions of a given coastal state[17] or in areas beyond national jurisdiction (the Area) on the International Seabed Authority (ISA) 1994 (now 2019), and the legal regulation for mineral mining on the seabed in areas beyond national jurisdiction which is known as the Area is set out in Part XI of the UNCLOS, 1982.[18] Ocean space is divided into zones by the UNCLOS and these are measured by reference to a baseline constructed from points in the coast of a state. The seabed mining activities as stated above is either governed by the national jurisdiction of a state or areas beyond national jurisdiction which can also be called international jurisdiction. A brief explanation on how to measure which parts of the sea is within the national or international jurisdiction is:

a. National Jurisdiction: The national jurisdiction could either be the Exclusive Economic Zone (EEZ)[19] or Continental Shelf.[20] The UNCLOS confers exclusive rights upon all 154 coastal states for the purpose of engaging in the exploration, exploitation, conservation and management of minerals within their jurisdiction.[21]

b. International Jurisdiction: The provision of UNCLOS establishes two zones beyond national jurisdiction, to wit; the High Seas[22] and the Area.[23]

There are currently groups that have indicated the highest level of interest in deep seabed mining, both actively and passively. They include:

a. Nations that have contracts for the purpose of exploration from ISA. These countries include India, China, South Korea, Japan, Russia and various European Union nations.

[16]Aline Jaeckel, *supra*.at 632.
[17]Lisa A. Levin, *supra* p. 2.
[18]Aline Jaeckel, A. Ardon and Kristina M. Gjerde, *Sharing Benefits of the common heritage of mankind-is the deep seabed mining regime ready?* (Marine Policy 2016) http://idx.doi.org/10.1016/j.marpol.2016.03.009 p 1.
[19] That is the water extends to 200 nautical miles from baseline.
[20] Which extends beyond 200 nautical miles up to 350 nm or even further where specific criteria by the UNCLOS are met.
[21]Lisa A. Levin *supra* p 5. See also Amari Omaka, *Fundamental of Maritime Admiralty and International Water Law*, (Princeton &Associates Publishing Co. Ltd, Lagos, 2018), p. 230.
[22] That is, 61% of the ocean beyond the EEZ.
[23]Ibid.

b. Nations with deep sea mineral deposits of commercial quantity and interests within national jurisdictions. These include Papua New Guinea, Tonga, Cook Islands and Namibia etc.

c. Nations who have actively mine the same type of minerals on land e.g. Chile and South Africa etc.

d. Mining companies that have claims within EEZ or have partnered with states on ISA exploration contracts e.g. U.K Seabed Resources Ltd, Global Sea Mineral Resources and Deep Green etc.

e. Research Institutions and Scientific Networks that are actually willing to bring science to decision-making and development of regulations e.g. JPI Oceans, the Deep-Ocean Stewardship Initiative and the Deep Ocean Observing Strategy etc.

f. States, Environmental Advocacy Groups, Intergovernmental Organisations (IGOs) and Non-Governmental Organisations (NGOs) that focus on conservation and biodiversity maintenance e.g. the International Union for Conservation of Nature, Deep Sea Conservation Coalition etc.

g. Other elements of the blue economy like the underwater cabling companies and deep-sea fishing industry with enormous potential conflicts.

h. Religious Groups and Civil Society who have been largely active locally and cognizance of exploitation of local and indigenous people; including but not limited to threats to their environment and culture. For example, Four Oceans and the Pacific Conference of Churches the Holy See, Deep Sea Mining Campaign etc.[24]

Although deep seabed mining activities according to assertion, has not yet commenced, contracts have been awarded for the exploration and exploitation of deep sea mineral resources within national jurisdictions and the Area. Information available shows that as far back as year 2001, deep seabed mineral exploitation Licenses within national jurisdiction, were granted by the Kingdom of Saudi Arabia and Papua New Guinea, however, neither has been mined. In addition, Tonga, New Zealand, Fiji, Japan and Solomon Islands have been granted permit to research and assess the mining viability. They countries were also issued exploration permits for national seafloor sulphides, albeit, some of these permits

[24]Lisa Levin *supra,* p. 9.

have collapsed.[25]

The International Seabed Authority has also awarded Exploration Contracts to member nations seeking to inventory mineral deposits and assess their commercial potential within a defined area and as of August 2019, it has been observed that ISA had agreed into mining contracts with a total of 29 contractors for the purpose of exploration concerning the three types of metallic deep seabed minerals.[26]

3.2. The Benefits of Deep Seabed Mining

Currently, deep seabed mining activities not commenced due to certain factors and circumstances which will be discussed subsequently, it is still important to discuss the advantages and benefits of the commencement of deep seabed mining (particularly in the Area) to the Maritime Industry globally. The benefits include:

Deep Seabed Mining in the Area will no doubt bring in increment in revenue to humankind as it will be collected and managed by the ISA. The UNCLOS makes provision for the sharing formula of the revenue.[27] It is to be shared equally taking into cognizance, the particular interests and needs of developing states'.[28] In an attempt to actualise this, the African Group of member states at the ISA indicated that a regime that would see benefits from mining in the Area tilt majorly to developed nations. It was the position of the African Group that wealthy shareholders of companies who are perhaps conducting the mining should not be permitted.[29]

a. Deep Seabed Mining is seen as potential benefits[30] the exploitation companies, shareholder and members of the supply chain through financial profits.[31]

[25]Marques S. & de Arayo, *T.C.M. Survey and Assessment of Seabed Resources from the Brazilian Continental Shelf by the Laws of the Sea: from National to International Jurisdictions* (Ocean Coast, Manage 2019) 178.
[26]Aline Jaeckel, *supra* p. 568.
[27] Article 140.
[28]Art. 140 UNCLOS, 1982.
[29]Statement by Algeria on Behalf of the African Group to the ISA (The African Group 2019).
[30] Ajuzie C. Osondu, *Modern Maritime Law and Practice in Nigeria*, (Unilag Press & Book Ltd, Lagos, 2020), p. 164.
[31]Kirchain R & Roth R, *MIT Presentation: Decision Analysis Framework and Review of Cash Flow Approach presented at the Financial Payment System Working Group Meeting* (ISA 2019).

b. Deep Seabed Mining is seen as facilitator of technological innovations. The exploration as well as impact monitoring may expand scientific knowledge which is currently lacking.[32]

c. Research that has to do with Deep Seabed Mining could also increase the knowledge and understanding of genetic resources with potential use for industrial agents, pharmaceuticals and biomedical products.[33]

3.3. The Regulatory Frameworks for Deep Seabed Mining Activities

As earlier stated, the United Nations Convention on the Law of the Sea (UNCLOS) 1982 created two jurisdictions; the National and International Jurisdictions. By the provision of the UNCLOS, coastal states have exclusive right to control and manage mining activities in the national jurisdiction and the International Seabed Authority on the areas beyond national jurisdiction as set out in Part XI of the UNCLOS 1982. The deep seabed mining is regulated in both State and International Levels.

1) State Level

In State Level, Coastal States are expected to adopt appropriate measures in order to exercise control over any seabed mining activities within their jurisdictions and state laws regarding the management and control of seabed mining should be nothing less than effective and efficient international rules, regulations and procedures.[34]' For instance, the Mining Code of the ISA which is presently under negotiation will go a long way to exert control by costal states.[35]

Also, direct obligations under international law in respect of seabed mining like employment of the best environmental practise and conducting prior environmental impact assessment is also applicable to states, especially states that have implemented national legislation to govern seabed mining activities such as Japan and Brazil etc.[36]However, several states that have actively engaged in exploration activities are yet to have a detailed regime in place, e.g. India, France, South Korea and Brazil etc.[37]

It is important to note that the creation of adequate legislative frameworks by

[32]First Report of the Code Project: Developing ISA Environmental Regulations (PPW Charitable Trust 2017).
[33]Lisa A. Levin, *supra,* p.7.
[34]Art. 208 of the UNCLOS 1982.
[35]ISBA/25/C/18-Draft Regulation on Exploitation of Mineral Resources in the Area (ISA 2019)
[36]Lily H., *Sponsoring State Approaches to Liability Regimes for Environmental Damage caused by Seabed Mining Centre for International Governance Innovation* (The Commonwealth Secretariat, and the ISA 2018)
[37]Comparative Study of the Existing National Legislation on Deep Seabed Mining, (ISA 2019) as cited in Lisa Levin p. 6

states is not in itself sufficient as the implementation and enforcement of these rules are also equally important.[38] And this is in line with the Articles 214 and 215 of the UNCLOS[39] which requires that appropriate environmental standards should not only be governed by the domestic legislation, it should also be implemented through efficient monitoring and development. And as such, provisions should be made for independent oversight, public notification of and participation in decision making.

2) International Level (International Seabed Authority)

At the international level, the UNCLOS conferred the regulation of areas beyond national jurisdiction on the International Seabed Authority. In an attempt at preventing states from asserting claims over substantial/larger portions of the ocean, it was unanimously agreed that the Area and its resources are to be controlled and managed by a common entity, The International Seabed Authority.[40]The International Seabed Authority was established by the UNCLOS 1982 and it is an autonomous International Organisation headquartered in Jamaica. Its main purpose is to regulate and control activities concerning seabed mining in areas beyond national jurisdiction (the Area). This authority came into existence into force in 1994 immediately after UNCLOS.

3) The Organs of the International Seabed Authority

The organs of ISA are: the Council, Assembly, Finance Committee, Enterprise and the Economic Planning Commission, the Legal and Technical Commission (LTC), and the Secretariat.

The Assembly is the highest organ of the Authority, and it is made up of all 168 States that are signatories to the UNCLOS. The activities of this organ are also made open to the general public for observation and this indeed allows for transparency.

The Council is an executive body comprising of 36 states. These states are no doubt elected in a number of different chambers designed so as to ensure a diversity of representation of different nations and interests. They include the largest investors in deep sea mining in the Area, major consumers or importers of relevant metals, major exporters of the relevant metals from land-based sources and indeed developing countries with special interests. For example, geographically disadvantaged islands and various regional geographical groups i.e. Africa, Eastern Europe, Asia-Pacific, the Caribbean, Latin America, Western Europe and others

[38]Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (ITLOS 2011) as cited in Lisa Levin p. 7
[39]Articles 214 & 215 of the UNCLOS 1982
[40]AlineJaeckel, *supra* p. 156

among others.[41] The council also gives reports to the Assembly that is made up of all 168 member states who meet at least once a year at the ISA's headquarters in Kingston Jamaica.

The Legal and Technical Commission consists of 30 individual members elected by the Council. The elected members serving in individual capacities have the responsibility of making recommendation and advice the council. It meets bi-annually and also considers application for ISA contracts and prepares of regulations, draft rules and procedures of the ISA that may be scheduled for the council consideration and adoption.[42] The Legal and Technical Commission holds its meetings in closed sessions, unlike the Council and Assembly that are open to observers. Although, the Assembly had encouraged Legal and Technical Commission to hold more open meetings to allow for greater transparency,[43]this is yet to see the light of the day.

The Finance Committee is in charge of the ISA Administrative budget. The ISA is supported in this task by a Secretariat which is equally based in Jamaica under the headship of Secretary-General who is the Chief Administrative Officer of the ISA. Secretary-General is under obligation to give support to all ISA meetings as well as performing such other responsibilities as may be directed.[44]

The Enterprise has the power to conduct exploitation and exploration of seabed minerals on behalf of the International Community. It was envisaged that it will also be an in-house mining arm of the ISA who will start operations through joint operations with other contracts [45]but so far, no steps has been taken so as to set the necessary Enterprise in Motion. Importantly, the Economic Planning Commission is given the task of examining the effects of mining in the Area with regard to land-based mining economies; and its functions is currently being controlled by the Legal and Technical Commission.

4) The Mining Code

Over the last two decades, the International Seabed Authority has been evolving its Mining Code. The Mining Code is a collective term for the regulations as well as recommendations that set out detailed regulations, rules, and procedures for seabed mining in the Area.[46] The Mining Code also refers to the whole of the comprehensive set of rules, regulations and procedures issued by the ISA to regulate prospecting exploration and exploitation of marine materials in the International Seabed Area. The rules, regulations and procedures are issued within

[41]UNCLOS 1994 Agreement, Annex, Section 3 para. 15.
[42]Art. 165 UNCLOS 1982.
[43]Assembly Resolution ISBA/23/A/13 (August 18, 2017).
[44]Art. 166 of the UNCLOS 1982.
[45]Lisa Levin *supra* p. 9.
[46]Aline Jaeckel, *supra* p. 2.

the legal framework established by the UNCLOS, in particular its Part XI on the Area and its 1994 Agreement relating to the Implementation of Part XI of the UNCLOS.[47]

5) The Mining Code: Standards and Guidelines

It is part of the practice as contained in the draft regulations for the purpose of exploitation of mineral resources in the Area[48] that certain standards as well as guidelines be designed by the organs of ISA to support the implementation of the regulations. The standards so developed will be legally binding on contractors and the ISA but the guidelines will be recommendatory in nature.

During the 25th session for the development of the standards and guidelines for the mining code, it was part of the council's request that the Legal and Technical Commission of the ISA undertake work on standards and guidelines. The Commission was mandated to carry-out the assignment as a matter of priority, noting that the proposed schedule and process is for the development of the standards and guidelines.[49] The Legal and Technical Commission makes recommendation concerning the following three phase approaches:

Phase 1: Standards and Guidelines considered necessary to be put in place as of the time of the adoption of the draft regulations on exploitation;

Phase 2: Standards and Guidelines considered necessary to be put in place prior to the receipt of an application of a plan of work for exploitation;

Phase 3: Standards and Guidelines considered necessary to be put in place before commercial mining activities commence in the Area.

The process recommended by the Legal and Technical Commission for the development of the standards and guidelines include the distribution of the drafts of stakeholder consultation. By July 2021, it was observed that two stakeholder consultations have taken place between August to October 2020 and April to July in 2021.[50]

It is important to note that the above exploitation regulations were supposed to be finalised in 2020, but the process has been slowed down due to the pandemic. Also, the UNCLOS can force the ISA to finalise the code either through fast-tracking the exploitation regulations or give contractors interested in seabed mining a

[47]The Mining Code, International Seabed Authority 2021, https://www.isa.org.jm/mining-code accessed on 24 October 2021.
[48]ISBA/25/C/WP 1.
[49]ISBA/25/C/19/Add. 1, Annex and Enclosure I and II.
[50]ISA, The Mining Code: Standards and Guidelines (2021) https://isa.org.jm/mining-code/standards-and-guidelines accessed on 24 October 2021.

licence under the yet to be finalised draft regulations.[51]

6) Common Heritage of Mankind

The seabed in areas beyond national jurisdiction is the common heritage of mankind as declared in Article 136 of the UNCLOS[52] which is to the effect that activities carried out within the Area is for the benefit of mankind as a whole. The common heritage of mankind principle not only requires the sharing of benefits but also the conservation and preservation of natural and biological resources for both the present and future generations.[53] In addition, it was highlighted in the UN General Assembly on 4th of December, 2009 that:

"The Common Heritage of Mankind is not solely about benefit sharing. It is just as much about conservation and preservation as it is about solidarity. Solidarity in the preservation and conservation is a good, we all share and therefore should protect. But also solidarity in ensuring that the good we all share is for all our benefit."[54]

Generally, the ISA was created to control and regulate deep seabed mining activities in the Area on behalf of Mankind, this also extends to State parties as they are expected to act as trustees on behalf of mankind as a whole and this is introduces a fundamental change in the legal regime governing the deep seabed through the common heritage of mankind principle.[55]

The legal status of the Common Heritage for Mankind is contained in Article 136 of the UNCLOS.[56] It was developed to manage mining in the Area and derogation from such is prohibited by the Convention. The main aim of the principle was to declare the Area to be outside the jurisdiction of states and to ensure that there is inter-generational and intra-generational equity with regards to managing, preserving and benefitting from the Area and its natural resources.[57]

7) The Principle of the Common Heritage of Mankind

The common heritage of mankind was initially controversial during the negotiations of the UNCLOSA, but it was eventually incorporated as an essential

[51]ElhamShabahat, *A Mining Code for the Deep Sea* (Hakai Magazine 2021) https://www.hakaimagazine.com/news/a-mining-code-for-the-deep-sea accessed on 24 October 2021
[52]Art. 136 of the UNCLOS 1982
[53]Aline Jaeckel*supra*p. 150
[54]Ibid
[55]R.Wolfum, *Common Heritage of Mankind in Max Planck Encyclopedia*(Public International Law 2009) https://opil.ouplaw.com/view/10.1093/uw;epil as cited in Aline Jaeckel p.151.
[56]Art. 136 of the UNCLOS 1982.
[57]D. Tladi, *The Common Heritage of Mankind and the Proposal treaty on biodiversity in areas beyond national jurisdiction: The Choice between Pragmatism and Sustainability* (Yearb. International Environmental Law, 2015) 113-132 http://dx.doi.org/10.30/2/0002831212437854

element into the convention. Although, there is no definition of the principle in the Convention, its broad scope is reflected in several key provisions of Part XI of the UNCLOS, 1982.[58] The elements present in the provisions of Part XI of the UNCLOS in relation to the common heritage of mankind are as follows:

Non-Appropriation: This means that all rights in the resources of the Area is vested in mankind as a whole and no state can claim sovereignty/sovereign rights over the Area and its resources.[59]

a. Common Management and Regulation: This is to the effect that all seabed mining activities in the Area are organised and controlled by the ISA on behalf of mankind as a whole and the rules and regulations adopted by the ISA is binding on all member states regardless of individual consent.[60]

b. Peaceful Purposes and Environmental Protection: The Area is open to use exclusively for peaceful purposes by all states and the ISA is required to ensure effective protection of the marine environment from harmful effects of seabed mining; prevent and reduce pollution; conserve the natural resources of the Area and prevent damage to the flora and fauna of the marine environment.[61]

c. Benefit-Sharing: Activities in the Area must be carried out for the benefit of mankind, especially with consideration to the interests of developing states and the ISA is to provide equitable sharing of financial and economic benefits derived from activities in the Area.[62]

d. State Responsibility: State parties must ensure that activities in the Area are carried out in conformity with the International Regulatory Framework and any damage caused by failure to comply entails liability.[63]

It is important to state that although the common heritage of mankind seeks to ensure that there is equity with regards to managing, preserving and benefitting from the Area and its natural resources, currently there are no measures put in place by ISA on which the principle can be given effect.

8) Effect of Deep Seabed Mining on Environment

One of the many obstacles connected with deep seabed mining is its impact on

[58]Aline Jaeckel *supra* p.151.
[59]Art. 137 of the UNCLOS, 1982.
[60]Art. 137(20), 153(1) and 156-185 of the UNCLOS, 1982.
[61]Art. 141 and 145 of the UNCLOS, 1982.
[62]Art. 140, 144 and 148 of the UNCLOS, 1982.
[63]Art. 139 of the UNCLOS 1982.

the environment.[64] This is compounded with the remoteness of most of the deep ocean in combination with the unfriendly operating conditions which requires expensive and highly technical equipment, which are unfortunately not readily available for the purpose of deep seabed mining.[65] These constraints and the vastness of the ocean itself means that majority of the deep ocean will be unexplored in both national and international jurisdictions.[66]

Biodiversity loss, forced species migrations and loss of connectivity are potent risks of Deep seabed mining that could lead to species extinctions in the deep ocean. This can impact the ecosystem in areas such as climate regulation, fisheries, nutrient cycling, detoxification among others, whose importance and values are not yet fully harnessed.[67] Currently, the ISA has started developing a plan which is called the Regional Environmental Management Plans (REMPs) and its main objective will be to provide region-specific information measures and procedures, to ensure adequate and effective protection of the marine environment in line with UNCLOS, 1984.[68] The objectives of the REMPs should have clear economic objectives that should include the following:

a. It must create environmental management strategies or measures, including but not limited to the designation of protected areas before or independent to contract placements.[69]

b. It should also undergo periodic assessments which can be fed into regulatory decisions and actions.[70]

c. It should also take into consideration the cumulative effects from multiple mine sites and seek to control potential conflicts occurring in the same region.[71]

It is essential to state that it is very difficult to anticipate and gauge how to reduce or mitigate the potential effects of deep seabed mining. This is because the current mitigation practises in terrestrial and shallow water extractive activities appears

[64]Amari Omaka, *Fundamental of Maritime Admiralty and International Water Law*, (Princeton &Associates Publishing Co. Ltd, Lagos, 2018), p. 274. See also Lisa Levin *supra* p. 4.
[65]Ibid.
[66]Major et al, *The Nippon Foundation-GEBCO Seabed 2030 Project: The Quest to see the World's Oceans completely mapped by 2030* (GeoSciences 2018) as cited in Lisa Levin p.4.
[67]Le, J.T. Levin and L.A Carson, R.T., *Incorporating Ecosystem Services into Environmental Management of deep seabed mining* (Deep Sea Res. Pt 11 2017) as cited in Lisa Levin p.5.
[68] See Article 145 of the 1984 UNCLOS.
[69]Tunnicliffe, V. Metaxas, A. Le.J, Ramirez-Llodra, E & Levin L.A, *Strategic Environmental Goals and Objectives: Setting the Basis for Environmental Regulation of Deep Seabed Mining* (Marine Policy 2020) 114.
[70]Wedding L.M et al, *From Principles to Practise: A spatial Approach to Systematic Conservation Planning in the Deep Sea* (Procedural Report 2013) 280.
[71]Lisa Levin *supra* p.5.

unachievable presently in the deep ocean.[72] Also, it must be pointed out that there has been no research or investigations that show the scale of impact that will be caused by mining activities in the deep seabed mining.[73]

3.4. The Deep Seabed Mining in Africa

As stated earlier, the UNCLOS 1982 requires the promotion of effective participation of developing state parties in activities of deep seabed beyond national jurisdiction, with regards to their special interests and needs, especially in landlocked and disadvantaged states.[74] Africa is a continent that appears to have low possibility of participating as it has several landlocked and geographically disadvantaged states.[75] Africa makes up 46 of the 168 members of the ISA, but it remains the only continent that has not already moved to take part in deep sea mineral exploration.[76] Africa currently has problems such as financial constraints, lack of technological innovation and poverty especially in relation to deep seabed mining. All these no doubt have hindered Africa continent from being fully involved in deep seabed mining activities, but there have been steps taken to salvage this problem.

It is important to mention that applications for the approval of a work plan for the exploration for polymetallic nodules in the Area in 2008 by two developing states in Africa[77]suggested that the way forward for developing states to participate in deep seabed mining is through the use of transnational corporations.[78]This approach however, was criticised as it required that African states will participate in deep seabed mining through subsidiaries of transnational corporations and this will defeat the spirit and intention of the provisions of UNCLOS which is to encourage the promotion of effective and direct participation of developing states in the activities carried out in the Area.

It appears that the most effective ways by which Africa can participate in deep seabed mining activities is through Strategic Alliances and Co-operative efforts amongst all the states in Africa. African States can achieve this through sharing of

[72]Van Dover & C.I. et al, *Biodiversity Loss from Deep Seabed Mining* (National Geosciences 2017) 10464-465
[73]Jones, D.O.B et al, *Biological Responses to Disturbance from Simulated Deep Sea Polymetalic Nodule Mining* (PLOS ONE 2017) 12.
[74]Art. 140 and 148 of the UNCLOS 1982.
[75]Edwin Egede, *African States and Participation in DSM: Problems and Prospects* (The International Journal of Marine and Coastal Law, 2009), p. 683.
[76]Fidelis Zvomuya, *Africa Eyes Underwater Mineral Treasures, But at What Cost?* (Oxygen Short 2020) https://www.theoxygenproject.com./post/africa-eyes-underwater-mineral-treasures-but-at-what-cost/ accessed on 25 October 2021.
[77]The applications were made by the Kingdom of Tonga and Republic of Nauru.
[78]Nauru Ocean Resources Inc: *Application for Approval of a Plan of Work for Exploration*, ISBA/14/LTC/L.2 and Tonga Offshore Mining Ltd: *Application for Approval of a Plan of Work for Exploration,* ISBA/14/LTC/L.3 (2008) https://www.isa.org.jm/en/sessions/2008/documents

experiences, information and facilities, to wit; research facilities, equipped ships, as well as human and financial resources with other entities engaged in seabed mining activities in a more formalised co-operation by way of partnership or a consortium. An example of this is the partnership of Inter Ocean Metal Joint Organisation, a multinational entity controlled by Bulgaria, and the developing states of Czech Republic, Cuba, Poland, Slovakia and Russia[79] signed a 15 year contract with the ISA for the exploration of polymetallic nodules in the deep seabed.[80]The benefits of co-operative participation in Africa, is that it will boost the economies of scale arising from a pooling of resources, including finance and manpower, and this will help to diminish the pressure on scare resources of individual states.[81]

Steps were taken to encourage co-operation between African States for the utilisation and development of mineral resources, although it was more related to mineral resources within African Continent.[82] Examples of various inter-governmental forums created to promote the co-operation for the utilisation and development of mineral resources by African states were the United Nations Economic Commission for Africa (UNECA), Sponsored Regional Conference of African Ministers Responsible for the Utilisation and Development of Mineral and Energy Resources in Africa. Conferences were held in Arusha (1981), Lusaka (1985), Kampala (1988) and the Democratic Republic of Congo (formerly known as Zaire) (1990) with the aim of promoting mineral development and energy resources amongst African states.

In 2017, a workshop on Marine Mineral Resources of Africa's Continental Shelf[83] and Adjacent International Seabed Authority (Prospects for Sustainable Development of the African Maritime Domain in support of Africa's Blue Economy).[84] It was organised by the ISA and the Republic of Uganda in conjunction with the African Mineral Development Centre (AMDC) and GRID-Arendal (Norway). This was, with the support of the United Nations Economic Commission for Africa (UNECA), African Union Commission (AUC) and the PEW Charitable Trust. The aims of the workshop were to:

[79] (One of the former pioneer investors).
[80]ISA, Selected Decisions and Documents of the 4th Session, ISA/99/01.E (Jamaica ISA 1999).
[81]Edward Egele, *supra* p.702.
[82]P.A Traore, *The Challenge of Building an Effective Co-operation for the Sustainable Development of Natural Resources in Africa (AESEDA),* Penn State University Symposium on Geo-resources Management: Human Capacity Development and Sustainable Livelihood (20030 as cited in Edward Egele*supra*p. 701.
[83] The Convention on the Continental Shelf 1958 is the regulatory lawn directly touching on this part of the sea. See Ahmed A, 'International Law of the Sea: An Overlook and Case Study' (Beijing Law Review, Vol.8 No.1, March 2017) available at https://www.scirp.org/journal/paperinformation.aspx?paperid=74577 assessed 10th December, 2022.
[84] This was held in Kampala Uganda, May 2017.

a. Increase Africa participation in decisions that affect the Areas;

b. Build relevant technical capacity with regard to activities in the deep seabed;

c. Participate in the activities of the Area;

d. Contribute its quota to sustainable development of Africa's Blue Economy; and

e. Define and enable sustainable activities in Africa's continental shelf.

Some of the recommendations were made in five sessions:

The 1st session was on the process of legal frameworks with regards to Africa's Blue Economy (especially development), how to further raise awareness African States on deep seabed mining and engagement in sustainable development of marine activities and among.

In the 2nd session, the focus was on the potential for sustainable prospects on the African Continental Shelf, the ISA and its scope and participation of African countries in the work of ISA were recommended for more attention.

In the 3rd session, recommendations and discussions focused on the rationale behind deep seabed mining investments, and creating data centres to support policy making and stakeholders' engagement in marine activities and African geological and mineral information systems.

The 4th session centred on discussions on strategies for the creation of African Centres of Excellence on seabed mapping. It also focused on special planning, research and training platforms, inter-institutional and regional collaborations. The research endeavours, especially could be used to inform the maritime practitioners as well as government concerning the deep seabed mining issues.

The 5th session explored possible private and public partnerships (PPP) for the growth and development of African marine activities. It also discusses the prospects and requirements for the preparation of an application for a plan of work for the exploration in the Area by African companies and governmental agencies.[85]

Ultimately, the workshop provided an opportunity to showcase how the mining of

[85]Marine Mineral Resources of Africa's Continental Shelf and Adjacent International Seabed Authority (Prospects for Sustainable Development of the African Maritime Domain in support of Africa's Blue Economy) (2017).

the deep seabed could contribute to a sustainable African Blue Economy. This narrative, where properly harnessed, it will better and reflect the kinds of development goals, as well as partnerships and forms of social reciprocity that African societies need as they are moving further into the 21st century.

In 2020, a workshop was also organised by the South African government and the UN's International Seabed Authority in Pretoria, South Africa, in an effort to pitch measures on how coastal states in Africa can benefit from deep seabed mining. The workshop left some environmentalists uneasy as the current generation of African leaders may not be up to the demanding task of commencing deep seabed mining activities in Africa. Despite this, some are certain that by 2030, African states will also become involved and connected in deep seabed mining, notwithstanding the current issue on environmental effect of deep seabed mining.[86]

In 2021, Mr. Mike Petersen, a respected independent environmental consultant based in Cape Town stated that Africa is vulnerable and it stands to be a casualty to deep seabed mining as corruption and poor environmental laws will cause chaos with the seas. He also emphasised that the environmental hazards of deep seabed mining should be compared to land-based mining projects within the continent before Africa fully involves itself in Deep seabed mining[87]

3.5. Deep Seabed Mining in Nigeria

Nigeria is a member of the International Seabed Authority and the Nigerian Maritime Administration and Safety Agency (NIMASA) warehouses is the Nigerian Secretariat, making it imperative for the Agency to participate in the annual sessions of the ISA. The Secretariat comprises of relevant ministries, departments and agency connected to the functions of the Authority since Nigeria is yet to establish its Seabed Authority. Nigeria was elected into the Council in 2011 for term of four years and the country has a permanent mission to the Authority in Jamaica.[88]

In August 2017, Dr. Dakuku Peterside, the then Director General of the Nigerian Maritime Administration and Safety Agency (NIMASA) while speaking at the opening ceremony of the 23rd Assembly of ISA which was held in Kingston Jamaica, stated that Nigeria was set to benefit from deep seabed mining as the Nigerian Federal Court was currently developing ideas or policies that will aid the harnessing of seabed resources. He also stated that the NIMASA is working with the navy to effectively enforce UNCLOS and other relevant international

[86]P.A Traore*supra.*
[87]Ibid.
[88]NIMASA: International Seabed Association https://nimasaa.gov.ng/services/legislation-of-international-seabed-association accessed on 25 October, 2021.

instruments around Nigeria's continental shelf.[89]However, as at 2021, it appears that Nigeria is not actively participating in discussions on the deep seabed mining, its benefits and environmental impacts.

1) Challenges of Deep Seabed Mining in Nigeria

Earlier, some of the advantages of deep seabed mining in the Maritime sector of the world economy were highlighted. It is essential to mention that despite the benefits that will be derived from deep seabed mining; there are some challenges that need to be addressed before deep seabed mining activities can be commenced. Some of these challenges include:

a. Lack of Transparency of some organs in the International Seabed Authority. For instance, the Legal and Technical Commission still held its meetings in private and workshops to develop policies are primarily run by invitation[90] only despite encouragement from the Assembly to make its sessions open to the public to allow for greater transparency. [91]

b. High Cost of carrying out deep seabed mining activities. One of the main challenges of deep seabed mining is how expensive it is to carry out deep seabed mining activities as the deep sea is vast and majority of it are yet to be discovered. In order to achieve the best deep seabed mining, the technology required is very expensive and it may not be accessible to all the states involved in deep seabed mining activities.

c. The Environmental Vulnerabilities. This is also another major challenge that is one of the reasons why the deep seabed mining activities are yet to be commenced. The deep seabed mining will affect the environment negatively and due to the nature of the deep seabed mining, it poses a great risk to the environment as it can cause irreversible damage to biodiversity on local scales and possibly wider areas, depending on the type of mining conducted.[92]

d. Fragmentation of the Governance of the International Seabed Authority. Currently, governance by the ISA is fragmented and there is need for the Authority to implement laws that will monitor the deep seabed mining activities.

[89]Sulaimon Salau, *Nigeria to exploit seabed mining potential* (The Guardian Newspaper 2017) https://guardian.ng/business-services/nigeria-to-exploit-seabed-mining-potential accessed on 25 October, 2021
[90]Earth Negotiations Bulletin Report of the March 2018 Special Session in Congress (2018) https://enblisd.org/vol25/enb2153e.html
[91]ISA Document ISA/23/A/13 (2017) https://www.isa.org.jm/documents/isba
[92]Kirsten Thompson *supra* p. 3

e. Lack of measures by the ISA on the principle of common heritage of mankind with regards to the environment and prevention of harm to the environment.

f. Lack of participation of African States in the discussions on the deep seabed mining. The participation of Africa is considerably lower to that of developed states in other continents in the world.

g. Lack of participation of Nigeria in deep seabed mining activities which is largely due to the fact that the country has yet to establish its Seabed Authority.

2) Recommendations

Having highlighted the various challenges that need to be addressed before the commencement of deep seabed mining, it is equally crucial to proffer possible solutions for these challenges. Some of the recommendations include:

a. It is recommended that the ISA should mandate its organ; the Legal and Technical Commission in particular, to be open to observers who are interested in deep seabed mining. This will ensure that the public has greater access to information on how effective the policies formulated are, and how effective the deep seabed mining activities will be as well as quality assurance that there is compliance with the provisions of the UNCLOS and ISA respectively.[93]

b. On the issue of the high cost of carrying out deep seabed mining activities, the recommendation is that a fund be established to cover research, monitoring and contingency damages arising from human activities in the deep sea and also, the creation of a regulatory body that will administer the fund. Such regulatory body would need the power to appoint independent experts, fine contractors and if necessary halt any mining activities that may be detrimental.[94]

c. It is also recommended that a strategic environmental assessment should be carried out to assess the effect of multiple activities in the ocean. This will also include assessments of the health status of the deep sea in order to determine how human actions and activities will affect it.[95]The ISA can also integrate and incorporate environmental management policies into the Mining Code so as to set regional cohesion and binding environmental standards that can be restructured in line with an adaptive management

[93]Kirsten Thompson *supra* p 3
[94]Ibid.
[95]Ibid..

approach. For example, the proposal by the Netherlands which introduced a Compulsory Establishment by the Authority of an Environmental Management Plan as a yardstick for granting contracts for exploitation and exploration in a designated area.[96]

d. On the issue of the fragmentation of the governance of the ISA, it is recommended that ISA should implement advanced data collection, establish robust monitoring protocols and research of deep-eco system through a coherent reliable international ocean agency.[97]

e. It is recommended that on issues concerning the environment and its protection, the ISA needs to define measures, standards and actions through which environmental aspects that are unique to the common heritage of mankind, can be given effect. Such measures may include: the funding of marine scientific research to increase knowledge of mankind;[98] public participation in value-based decisions;[99] debates for the need for deep seabed mining and other alternatives to it;[100] limiting environmental impacts and a compensation scheme for environmental harm for states that are affected by deep seabed mining activities.[101]

f. It is recommended that African States in partnership with the ISA organise more workshops to discuss how Africa as a continent can be involved in deep seabed mining like its counterparts in other developed countries. Also, it is recommended that African states work in co-operation by pooling resources together as this will ensure that countries that have scarce resources are not left behind in the participation of deep seabed mining activities.

g. Lastly, on how Nigeria can participate in deep seabed mining, given the fact that the country is already a member of the ISA, it is imperative that the country be fully involved in the discussions surrounding seabed mining so as not to be left behind. This can be achieved by: organising yearly sensitization programmes and workshops to inform the general public, relevant stakeholders and regulatory bodies in the Maritime industry and the government on the various resources found in the sea, their uses and benefits, the ISA and its activities, as well as the economic benefits of deep seabed mining to individuals, organisations and the government of

[96]AlineJaeckel, *Deep Seabed Mining and Adaptive Management: The Procedural Challenges for the ISA* (Marine Policy 2016) p. 5-6 https://dx.doi.org/107016/j.marpol.2016.03.008
[97]Kirsten Thompson,*supra* p.9.
[98]Aline Jaeckel *supra,*p.152.
[99]Ibid p.153.
[100]Ibid.
[101]Ibid p. 154.

Nigeria.[102] Also, a Seabed Authority should be established and it will consist of identified and relevant ministries, departments and agencies; formulation of national legislation in line with the activities of the Seabed Authority and recruitment of candidates with technological and scientific expertise within the relevant fields.[103]

4. Conclusion

It was concluded in this paper that before the deep seabed mining activities can commence, it is necessary that wide and extensive research be carried out on its effect on the environment, the various organs in International Seabed Authority should be more transparent on their activities to the public and African States particularly Nigeria should organise workshops to educate the Maritime Industry of various states about the involvement and participation of African nations in the deep seabed mining activities like their counterparts in other countries in the World.

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