

Forum: Environmental Commission

Topic: Regulating Deep Sea Mining Activity and Weighing Its Effect on Marine Biodiversity

Chair

Introduction

In an era where the world is moving toward renewable energy, the need for crucial minerals such as lithium, cobalt, nickel, and other rare earth elements keeps increasing. Such minerals are crucial to modern technologies like electric vehicles, renewable energy infrastructures, and communication systems, as well as healthcare and military use. With countries and corporations relying increasingly on the vast mineral reserves available on the ocean floor, the world faces an unprecedented challenge. The theme of the 2026 Amman Model United Nations, "Moderating Morality", reflects the pressing need for discussion on how to address ethical dilemmas presented by deep-sea mining, where the drive for technological innovation and climate protection needs to coexist with moral obligations to preserve the delicate marine ecosystems and the communities relying on them.

Critical minerals including lithium, cobalt, nickel, and various rare earth minerals are important to the modern world since they help to promote renewable energy technology, transportation, communication, health care, and even national security, thus becoming increasingly important in economic development and in the transition towards energy. With the increasing demand for critical minerals across the globe, there is an ongoing effort by governments and companies to mine for these minerals at the bottom of the ocean floor, which houses thousands of square kilometres of mineral deposits. The main reason behind deep-sea mining is the need to have a consistent supply of the critical minerals that can help satisfy the rising demand for renewable energy technologies and advanced industries.

Various problems arise because of deep-sea mining, as this practice could have a long-lasting impact on the ecosystem of the oceans as well as its biodiversity. It is important to note that the deep seas are one of the most unexplored ecosystems on Earth, and there are a lot of unknown species and habitats. The processes of excavation and the formation of sediment plumes could be dangerous for the environment and the life cycle of many organisms. In addition, since many of the organisms in the deep sea have low reproductive rates and growth rates, scientists suggest that it might take several decades, or even hundreds of years, to restore the disturbed ecosystem. Thus, these environmental issues have caused an international discussion on how to mediate the need for harvesting minerals from the deep sea with environmental protection. To address the discussed issue, it is necessary to collaborate internationally between governments, scientists, and international organisations to achieve a compromise between the need for critical minerals and marine ecosystem

protection.

Regarding the effects of deep-sea mining, coastal communities, Small Island Developing States (SIDS), and indigenous communities may face the biggest challenges. The reason is that many of the indigenous communities depend highly on the health of the marine ecosystem for food security, jobs, cultural practices, and economic growth. If the marine ecosystem is harmed due to deep-sea mining, there can be effects on the fisheries, biodiversity, and the communities depending on the health of the marine ecosystem. In SDG 14, which is "Life Below Water," the significance of conserving and utilising the oceans, seas, and marine resources sustainably is stressed.

Definition of Key Terms

Deep-sea mining

Deep-sea mining is the process of extracting mineral resources from the ocean floor, usually at a depth of more than 200 meters below sea level. It is carried out to obtain valuable minerals such as cobalt, nickel, copper, and manganese that are used in renewable energy technologies and other modern industries.

Critical minerals

Critical minerals are natural resources that are essential for economic development and modern technologies. Minerals such as lithium, cobalt, nickel, and rare earth elements are widely used in batteries, electric vehicles, wind turbines, and electronic devices.

International Seabed Authority (ISA)

The International Seabed Authority (ISA) is an international organisation established under the United Nations Convention on the Law of the Sea (UNCLOS). It is responsible for regulating deep-sea mining activities in international waters while ensuring the protection of the marine environment.

United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS is an international agreement that establishes the legal framework governing the world's oceans and seas. It defines the rights and responsibilities of countries regarding the use and protection of marine resources, including those found on the deep seabed.

Marine Biodiversity

Marine biodiversity refers to the variety of plants, animals, and other living organisms found in oceans and seas. It is essential for maintaining healthy marine ecosystems and supporting the many resources and services the oceans provide.

Polymetallic Nodules

Polymetallic nodules are rock-like mineral deposits found on the deep ocean floor. They contain valuable metals such as nickel, cobalt, copper, and manganese, making them one of the main targets of deep-sea mining.

Sediment Plumes

Sediment plumes are fine particles that are released into the ocean waters because of deep-sea mining. These particles are mostly made of fine suspended materials like deep-sea clay, silt, and tiny, microscopic organic skeletons.

Small Island Developing States (SIDS)

Small Island Developing States (SIDS) are developing countries that face unique social, economic, and environmental challenges due to their small size and geographic isolation. Many SIDS rely heavily on healthy oceans for food security, employment, and economic development, which makes them particularly vulnerable to the impacts of deep-sea mining.

General Overview

Deep-sea mining refers to the process of mining valuable minerals from the ocean bed, usually below 200 meters below sea level. The mineral deposits contain precious minerals like cobalt, nickel, copper, manganese, and rare earth minerals used to manufacture

batteries, electric vehicles, wind turbines, solar panels, and other items. With the increasing demand for renewable energies and technological innovations, there is now an interest in mining for these minerals on the deep ocean beds. Three different kinds of mineral deposits can be found deep under the ocean bed. They include polymetallic nodules, polymetallic sulphides, and cobalt-rich crusts. After extraction, the mineral deposits are lifted to the surface for processing to extract the precious minerals for use in manufacturing renewable energies and other technological products.

Despite the opportunities that deep-sea mining provides for mineral extraction, this process brings various environmental concerns because of the effects that it might have on marine ecosystems and biodiversity. Deep waters contain ecosystems that are extremely vulnerable and poorly studied, as there are still many species unknown to science. Mining operations involve disturbances of ecosystems that are thousands of years old and contain species unique to this Earth. Moreover, during deep-sea mining, sediment plumes are created; these are the clouds of fine material that can be spread out of the mining area and smother living organisms, as well as affect the processes of their feeding and reproduction. As the recovery process in most deep-sea mining ecosystems is very slow and the extent of damage that is done is being researched, it may lead to irreversible damage to the environment.

Deep-sea mining has become an increasingly important topic on an international level, with member states holding different views surrounding its environmental impacts and potential benefits. There are different views among nations regarding deep-sea mining. While some countries believe in promoting it to ensure that they receive critical minerals to fuel their development and the energy transition process, others believe that deep-sea mining must stop until scientific research is conducted on the effects of deep-sea mining on the environment. This debate is due to the conflict between balancing economic development with the conservation of marine ecosystems. Because many parts of the deep sea have not been studied yet, scientists are yet to know the long-term effects of deep-sea mining and whether they are permanent or not.

In the long run, if deep-sea mining expands without effective environmental management, marine ecosystems could face severe and long-lasting consequences. Research shows that the deep sea is among the ecosystems that have the least capability of recovering after experiencing disturbances. Research even shows that evidence of disturbance in the

ocean floor remains for more than forty years after the disturbance occurs. As a result, damage to the deep-sea ecosystem results in the loss of biodiversity, destabilisation of the food chain, and dysfunction of the ecosystem services, which are crucial for the health of the ocean.

When it comes to the impacts of deep-sea mining, coastal communities, Small Island Developing States (SIDS), and Indigenous communities are highly dependent on marine ecosystems and are among the most vulnerable groups. The communities rely on marine ecosystems as their main source of food supply, fisheries, tourism, culture, and economy. Any changes to the state of the marine ecosystem may lead to a decrease in fish populations, biodiversity loss, as well as difficulties in the livelihood of millions of people depending on the ocean. SIDS are especially vulnerable as their economy depends on healthy oceans for the purposes of fisheries, tourism, and sustainable development. SDG 14, "Life Below Water", calls for the need to conserve and sustainably use the oceans and their resources, which means the protection of marine biodiversity along with the responsible future exploitation of deep-sea resources.

Subtopic 1: Addressing the Precautionary Principle with Mineral Security

The growing demand for critical minerals created a difficult challenge for governments that are trying to balance economic growth with environmental sustainability. Most nations believe that deep-sea mining can solve the problem of providing critical minerals that are used in renewable energy technology, electric cars, and other industries. However, the scientific community remains uncertain about the environmental effects of deep-sea mining, which are still unknown. This is because the deep sea is one of the most unexplored parts of the planet, with many species and processes left not fully studied.

Many countries base their position on deep-sea mining on the precautionary principle. This principle suggests that activities that can lead to serious or irreversible environmental effects should not take place before there is enough scientific proof that the risks can be effectively managed. This way, some nations support delaying commercial deep-sea mining operations until there are adequate regulations and enough scientific evidence about it. At the same time, other countries consider exploration and technology development more essential.

Subtopic 2: Strengthening The International Seabed Authority (ISA)

The International Seabed Authority (ISA) plays a crucial role when it comes to the regulation of mineral-related activities in international waters according to the United Nations Convention on the Law of the Sea (UNCLOS). The ISA is responsible for issuing contracts for exploration and development of environmental regulations and conducting activities on the international seabed in the interest of humanity while protecting the marine environment.

Although crucial in many ways, the ISA has been criticised regarding the speed at which it has developed commercial mining regulations, transparency in negotiation, and the efficiency of environmental regulation. Several governments, scientists, and environmentalists have called for stronger environmental regulations, increased transparency in the negotiation process, and the inclusion of science in the decision-making process. Improving the ISA is seen as a crucial step in ensuring responsible and consistent management of deep-sea mining.

Subtopic 3: Evaluating the Need for Deep-sea Mining Against Different Sustainable Alternatives

While supporters of deep-sea mining suggest that it can assist in meeting the rising demands of critical minerals used in renewable energy technology, others say that there are several other ways to address this situation without engaging in commercial mining operations and damaging the marine ecosystem.

Some of these more sustainable methods include the increased recycling of batteries and electronics waste, improving efficiency in resource use, adoption of circular economy principles, and development of new types of batteries that require fewer critical minerals. Expanding responsible land-based mining under strong environmental regulations has also been suggested as another alternative. Evaluating these options allows governments to consider whether future mineral demand can be met while minimising risks to marine biodiversity and ocean ecosystems.

Major Parties Involved

International Seabed Authority (ISA)

The International Seabed Authority (ISA) is the United Nations organisation responsible for regulating mineral-related activities in international waters under the United Nations Convention on the Law of the Sea (UNCLOS). The ISA grants exploration licenses, makes regulations for commercial mining, and ensures the sustainable management of mineral resources while safeguarding the marine environment. The ISA plays a central role in the international debate because countries are still negotiating how commercial deep-sea mining might be regulated and the rules that could be added.

United States of America (USA)

The United States expanded its efforts to aim at ensuring greater availability of crucial minerals used in renewable energy technology and advanced manufacturing processes. While the US is not a party to the UNCLOS, it has recently encouraged countries to speed up the development of deep-sea mining activities within their jurisdictions, reducing dependence on foreign sources of minerals.

China

China is among the top consumers of critical minerals in the world. They also extensively invested in the exploration of minerals from the deep sea. With the help of government-sponsored research and exploration contracts, China aims to secure a continuous source of mineral supply to be used in battery manufacturing and renewable energy industries, among others. This growing involvement has made deep-sea mining more geopolitically relevant.

Small Island Developing States (SIDS)

Small Island Developing States (SIDS) depend highly on healthy marine ecosystems, which serve as sources of fisheries, tourism, and development. SIDS worry that deep-sea mining may affect the marine ecosystem adversely and harm the livelihoods of communities near the coastal areas. Some island nations support deep-sea mining due to its economic benefits, while others advocate for stronger environmental protection through a temporary pause on deep-sea mining until more scientific research is available.

The Metals Company (TMC)

The Metals Company is among the leading private companies involved in deep-sea mining. The company operates in the area known as the Clarion Clipperton Zone, where they focus on mining polymetallic nodules. The company believes that the practice will help satisfy the growing demand for the minerals that will support the energy transition worldwide by reducing the pressure on some mining sites on land.

International Union for Conservation of Nature (IUCN)

The International Union for Conservation of Nature (IUCN) is a worldwide environmental non-governmental organisation that promotes the conservation of biodiversity and the sustainable management and use of natural resources. The IUCN has advocated for the use of the precautionary approach in relation to deep-sea mining because there is insufficient scientific information about the deep-ocean ecosystems and potential environmental impacts are not fully understood yet.

Timeline of Events

Date:	Event:
1872-1876	During the British HMS challenger expedition, polymetallic nodules were first discovered on the ocean floor, marking the beginning of scientific interest in deep-sea mineral resources.
1965	John L. Mero published The Mineral Resources of the Sea, increasing global scientific, governmental, and commercial interest in deep-sea mining.
1980	The United States passed the Deep Seabed Hard Mineral Resources Act (DSHMRA), establishing a national legal framework for deep-sea mining activities.

1994	The United Nations Convention on the Law of the Sea (UNCLOS) established the International Seabed Authority (ISA) to regulate mineral-related activities in international waters and protect the marine environment.
2019	Papua New Guinea granted the Solwara 1 mining lease in 2011 and then it later collapsed in 2019
2021	The Republic of Nauru triggered the ISA's "two-year rule," requiring the authority to consider commercial mining applications even if mining regulations were still not complete.
2023-2024	More than 30 countries, alongside scientists and environmental organizations called for a temporary pause on deep-sea mining until further scientific research is conducted.
2025	U.S President Donald Trump signed an executive order aimed at accelerating the approval of deep-sea mining permits under U.S. law which increased international debate over the governance of deep-sea mining.

Attempts to solve the issue

United Nations Convention on the Law of the Sea (UNCLOS) (1982/12/10)

The UNCLOS is the single most important international agreement that established the legal framework for ocean governance. It declared the seabed beyond national jurisdiction the "common heritage of mankind," and later led to the creation of the ISA to regulate deep-sea mining. However, a limitation is that not every country has ratified UNCLOS, which reduces its universal application.

IUCN Resolution 122 "Protection of Deep-Ocean Ecosystems and Biodiversity through a Moratorium on Deep-sea Mining" (2021/09/10) (Resolution number:

WCC-2020-Res-122)

The International Union for Conservation of Nature (IUCN) adopted Resolution 122 to encourage governments to implement a temporary pause on commercial deep-sea mining until sufficient scientific knowledge and effective environmental safeguards are in place. The resolution emphasised the importance of protecting marine biodiversity, applying the precautionary principle, and ensuring that environmental risks are fully understood before commercial mining begins. While the resolution strengthened international awareness of the issue, it is not legally binding and depends on voluntary implementation by governments and communities.

The Ocean Diplomacy Resolution (2026/04/28) (Resolution number: TA-10-2026-0121)

The European Parliament adopted the Ocean Diplomacy Resolution to strengthen international cooperation in protecting the world's oceans and upholding international maritime law. The resolution expresses concern over unilateral deep-sea mining activities that could undermine the authority of the International Seabed Authority (ISA) and the United Nations Convention on the Law of the Sea (UNCLOS). It also calls on European Union Member States to support a science-based approach and to oppose attempts to bypass internationally agreed regulations governing deep-sea mining. However, as a European Parliament resolution, it is not legally binding on countries outside the European Union.

The Arctic Seabed Mining Resolution (2024/02/07) (Resolution number: P9_TA (2024) 0068) (formerly Motion B9-0095/2024)

The European Parliament adopted the Arctic Seabed Mining Resolution is response to Norway's decision to permit commercial deep-sea mining in parts of the Arctic Ocean. The resolution highlighted the limited scientific understanding of the environmental impacts of deep-sea mining and called on governments to delay commercial mining until sufficient scientific research and environmental safeguards are in place. It also urged the European Commission to suspend public funding for seabed mining technologies and reaffirmed the European Union's support for protecting marine biodiversity. However, the resolution is not legally binding and applies primarily to the European Union and its member states.

Convention on Migratory Species (CMS) (2024/02/17) (Resolution number:

UNEP/CMS/Resolution 14.16)

The Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) adopted resolution 14.16 to encourage member states to avoid supporting commercial deep-sea mining due to its potential impacts on migratory marine species. The resolution highlighted concerns that underwater noise, sediment plumes, and habitat disturbance could threaten species such as whales, sharks, and sea turtles that rely on healthy marine ecosystems. It also called on governments to strengthen international cooperation and prioritise the conservation of marine biodiversity when considering deep-sea mining activities. While the resolution reflects the collective position of CMS member states, it is not directly legally binding and relies on individual countries to implement its recommendations through national policies.

UNEP FI Sustainable Blue Economy Finance Initiative (2022/05/24)

The United Nations Environment Programme Finance Initiative (UNEP FI) published the Harmful Marine Extractives Briefing to guide financial institutions on the environmental risks associated with deep-sea mining. The briefing concluded that financing, investing in, or ensuring deep-sea mining activities is inconsistent with the Sustainable Blue Economy Finance Principles because of the potential irreversible damage to marine ecosystems and disruption of ocean carbon storage. IT encouraged banks, insurers, and investors to avoid supporting deep-sea mining projects until sufficient scientific evidence and effective environmental safeguards are established. However, the briefing served as only a voluntary financial framework and is not legally binding under international law.

Possible Solutions

Subtopic 1:

It is necessary to address the growing concerns regarding the health of our oceans due to the increased risk that deep-sea mining is causing to marine ecosystems. Nations must hold off on greenlighting big commercial projects on the seafloor until we have enough solid research to truly understand the long-term damage. Governments and the International Seabed Authority (ISA) must insist on deep environmental impact reviews before issuing permits, while establishing strict, protected sanctuaries where mining is completely off-limits. Having third-party researchers monitor active exploration sites and publish their data openly is crucial for keeping decisions completely unbiased. Meanwhile, nations can safeguard their mineral supplies by scaling up local e-waste recycling, finding diverse land-based partners, and designing new tech that cuts out these critical minerals altogether. If any small pilot tests do get approved, they need to be watched constantly and shut down the second any ecological damage is detected. Pushing for circular economy models to cut down on our resource demands can also help with this issue.

Subtopic 2:

Strengthening the legal mandate of the International Seabed Authority (ISA) is crucial as the threat of unregulated commercial mining in international waters continues to grow. Before any mining projects actually begin, the ISA has to lock down binding, enforceable rules. These regulations need to set high environmental standards, require regular hands-on inspections, and hold companies legally liable for restoring any ecological damage they cause. The authority also has to pull back the curtain by launching public databases for scientific assessments, contract agreements, and real-time environmental data. On top of that, we need to give developing nations, Small Island Developing States (SIDS), and Indigenous groups a real seat at the decision-making table instead of letting them be sidelined. Setting up a permanent scientific committee within the ISA would go a long way in keeping policies updated as new research comes out. Working together to build a more transparent system of governance can also help resolve this issue.

Subtopic 3:

Reducing the demand for new mineral extraction would reduce the necessity for deep-

sea mining. This could be achieved by funding actual recycling processes for old electronic devices, used batteries, and renewable energy equipment, as the process of recovering metals such as lithium, cobalt, nickel, and copper would become easier and more accessible. Moreover, it is up to the manufacturers to create long-lasting, easily repairable products that do not require any rare earth minerals. Funding the development of alternative battery technology which would be free from the listed minerals is another step we can take. In contrast to deep-sea mining, the regulation of land mines is straightforward, and the environmental consequences are well known.

Guiding Questions

1. Does your delegation support, oppose, or remain undecided on commercial deep-sea mining? Why?
2. Does your delegation rely on critical minerals for renewable energy technologies, manufacturing, or economic development?
3. How can countries balance the growing demand for critical minerals with the protection of marine biodiversity?
4. Should commercial deep-sea mining proceed before scientists fully understand its environmental impacts?
5. What role should the ISA play in regulating deep-sea mining activities?
6. How can international cooperation improve scientific research, environmental monitoring, and the sustainable management of deep-sea resources?
7. Should environmentally sensitive areas of the deep ocean be designated as protected areas where mining becomes prohibited?
8. What sustainable alternatives, such as battery recycling, circular economy practices, or alternative technologies, could reduce the need for deep-sea mining?
9. How might deep-sea mining affect coastal communities, SIDS, Indigenous communities, and global fisheries?
10. What responsibilities do countries and private companies have to ensure that the extraction

of critical minerals does not cause irreversible damage to marine ecosystems?

Appendix

- Using bullet points, give links the delegate may find useful in their research.
- https://www.wri.org/insights/deep-sea-mining-explained
- https://www.oceans-research.com/deep-sea-mining-threats-alternatives/
- https://www.oceans-research.com/deep-sea-mining-threats-alternatives/
- https://biologicaldiversity.org/w/news/press-releases/nations-meeting-in-jamaica-urged-to-maintain-deep-sea-mining-moratorium-2026-07-10/
- https://www.nature.com/articles/s41586-025-08921-3
- https://www.google.com/url?sa=i&source=web&rct=j&url=https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm&
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Contact Information

Chair: Ghalia Yaghmour

ghalia_yaghmour@abs.edu.jo

+962790755750