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On the Environmental Responsibility for Extracting Natural Resources from the Deep Seabed

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Abstract

Minerals in nature are one of the most valuable treasures on the earth, which due to the limitation of these resources on land and its heterogeneous distribution in different countries, has made human beings think about extracting the new resources. The limited mineral resources on land and the heterogeneous distribution of these substances in different countries have made human beings think about extracting and using the resources of other parts of the earth and even other planets. Deep-sea mineral resources can be considered as a reliable alternative to compensate for the limitations of land resources. The developed countries were more concerned with the use of these resources than others because, given the dependence of their economies on third-world mineral resources, the development of offshore resources could mean the liberation of their economies from this dependence. In political and scientific circles, the concept of the common heritage of humanity was gradually introduced, based on which activities related to mining in the deep sea. The method of this research is a descriptive-analytical study using library resources, the study of articles, and a review of environmental treaties and related internet resources. The result of this research shows, that none of these legal systems in the field of responsibility can respond to the challenges independently. This research tries to provide a legal solution by considering the opinions of environmental experts, an executive solution about achieving new financial resources based on combined systems of environmental responsibility.

Key Words: Environmental Responsibility, International Deep Seabed Authority, Environmental Damage, Marine Mining

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Introduction

The general purpose of this research is to get acquainted with international environmental responsibility systems using methodology descriptive analysis, using of library resources and reviewing international environmental treaties about this matter. This research in 5 sections surveys the formation, goals and principles of the international responsibility systems. The study is included structure and function of the international deep sea authority as the main custodian of monitoring activities of the seabed. Moreover, it reviews the concept of environmental pollution and the dimensions of marine mining. The main focus of this research is on the study of executive legal frameworks for the protection of the marine environment. It deals with this issue by reviewing the various intellectual foundations related to the system of pure, absolute responsibility and responsibility for unrestricted actions. (Josran and Sally) In the following, the obligations and responsibilities of the authorized agents who operate on the seabed along with the obligations of governments to protect the marine ecosystem and their guarantees have been studied. The other outstanding aspect of these suggestions is to improve the quality of the marine situation environment with a sustainable development approach (Levin, Amon, & Lily, H. 2020).

The importance of this study is that due to the vulnerability of the environment, especially the marine environment, compensation and restoration and restoration of the previous situation is practically impossible, so it is necessary to establish a comprehensive system of environmental responsibility and with Relying on the principle of prevention and precaution before mining, you have the necessary ground for effective protection or in case of damage or pollution, effective measures to maximize the desirability of the marine ecosystem to be done in this regard from recent research and theories inspired by environmental scientists (Yan et al ,2020). Whether the current liability system has been able to achieve this mission is the main concern of this study and the author has reviewed one-dimensional systems and made



a proposal for a combined liability system with suggestions from recent environmental studies (Sparenberg, 2019).

With the clarification dimensions of compound environmental responsibility, more comprehensive principles can be achieved than the responsibility of states in the field of environmental accidents, especially in the seabed, which can be used as a guide and action plan to open its place among soft legal resources. The most important positive feature of this action will be flexibility and the ability to update based on environmental requirements, ecological changes and new theories of environmental experts (Niner et al, 2018). All things considered, the first thing that needs to be done is to move from exploration to exploitation at a slower pace, which will allow the International Seabed Authority to draw up a road map and introduce new rules in line with environmental capacity for more effective protection (Levin, Amon, & Lily, H. 2020).

2. Background and Aim

1.2. International environment responsibility

Governments are responsible for the damage to other governments, regardless of how they damage the environment. The international responsibility of the government in the field of environment is realized by violating the international obligations not to comply with environmental standards. In a more detailed look, this violation can be considered in addition to the violation of direct international obligations, lack of proper care, i.e. the best effort of the government using the available facilities and capabilities (Pournouri, 2014, p.126). Commitment to due diligence for governments stems from a more important and fundamental commitment called the commitment to "prevention", which are the two main axes of international environmental responsibility (Tanaka, 2015, p136). The importance of this commitment stems from the impossibility of full compensation for environmental damage and pollution.

2.2. The International Seabed Authority (ISA)

Discovery of billions of tons of nickel, copper, cobalt and also the discovery of billions of tons of copper, nickel, cobalt, and manganese between 1872 and 1876 in the oceans and seas on the one hand, and the technological capability of the industrialized countries in the exploitation and reprocessing of these raw materials, on the other hand, turned the minds of the international community to the creation of an international regime for the institutional and peaceful harvesting of the region's abundant resources. Finally, at the Third Conference on the Law of the Sea, after the recognition of the seabed and seabed region, despite the differences between developed and developing countries, the International Deep-Sea Authority was established as an international organization to control and monitor mining activities in the deep sea region (Churchill, & Loo, 2018). Furthermore, mining process with overnments must monitor and control the sea bed a precise standard. Domestic law in this area should not be less .important than international law Another key point, t hel aw of thesea acts as the wings of thei nternationalseabed authoritywhich gives it , r, while the main challenges facing the dynamism, mobility and powe I.S.A includes issue of the jurisdiction of governments, which oversee the actions of contractors and operators, mainly through various government agencies, each with different interpretations of the law (Levin, Amon, & Lily, H. 2020).

3.2. Environmental damage

"Damage" in the field of international law is the loss or damage caused to persons, property, and the environment as a result of the act or omission of the subjects of international law or as a result of natural disasters. The environment in its general sense includes water, air, soil, plants, and animals. Therefore, damage to the environment means damage to each of these elements. Unfortunately, to date, due to the divergence of opinions among jurists, there is no coherent, uniform, and enforceable legal definition of environmental damage. In the international arena, this is practically the main obstacle in the way of environmental compensation.(Kiss,Sand & Langue ,2013, p52)



4.2. Offshore mining

After obtaining a mining permit from the authority, the contractors first try to better understand the amount and distribution of mineral resources and metal lumps in the area through research and exploration vessels through mapping and by small probes (Research submarines) (Ziaei Bigdeli, 2011).

Once the quantity and density of these lumps have been approved and found to be economically viable, the operation will begin. The operation is such that collecting robots are transported to the target area by large ships and from there are sent underwater. These robots are remote controlled and are guided through the command room on the ship. The whole process of this process is marine mining, which after extraction, involves the transport of dredged sediments and extracted resources to the container vessels (Kiss, Sand & Langue, 2013, p. 52).

As a matter of fact, collecting and coordinating high quality scientific information from seabed resources that can cover the existing gaps that have led to lack of decision-making in this area. It also provided a good platform for the exchange of scientific research in the field of offshore mines to implement safe mining and prevent damage from unprincipled exploration. (Levin, Amon, & Lily, H. 2020)

3. Study of executive and legal structure of international seabed ecosystem preservation

International liability, as an international legal entity, is the obligation to compensate for material or moral damage (inflicted on the subjects of international law), which must be due to an illegal act or refusal to act lawfully and contrary to international law (Common law or contractual) (Ansari, Faeghirad, 2018). In sum, the basis and source of international responsibility is the subject of three fundamental theories;

The first two, the theory of error or subjective liability and the theory of danger or objective liability, are rooted in classical international law, and the third, liability for unrestricted acts, is the result of modern international law.

Subjective theory: The offending is considered responsible if his fault can be proved by determining the relationship between cause and effect.

Objective theory: Any violation of customary or treaty rules of international law if the relationship between harmful acts and damages is proven, whether intentional or inadvertent.

Responsibility of Not Prohibited act theory: This theory is about actions that are not prohibited fundamentally, but if, they cause damage to other countries, compensation for this damage is one of the obligations of the country causing the damage. The right to have a healthy environment is a fundamental right, and anything that jeopardizes it, whether of contractual or customary origin, will be liable for the party that cause damages. These damages can be caused by an accident such as Chernobyl with environmental effects or, like the Trail Smelter (metal smelter factory), due to its normal operation. In other words, regardless of how other governments damage the environment, governments are environmentally responsible for the damage (Nandan, Satya, 2006). According to the principles of environmental law, it is necessary to prove the elements necessary for governments to be held accountable, which are:

Attribution of harmful acts to the government and the existence of a causal relationship between harmful acts and environmental damage; and another important element is ensuring that the commitment to proper care is fulfilled.

For this purpose, a breach of the due diligence obligation must be demonstrated. There are two views in this regard. In the first view, a government that does not make the appropriate effort has international responsibility. In the second view, if significant environmental damage has occurred, civil liability, i.e. liability for the harmful effects of legal activities, is created, which is referred to as the "obligation to compensate for the damage".(Khalatbari,Bavand & Zare ,2016).



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Environmental damage caused by activity in the seabed and subsoil is material damage that can be both accidental, such as when a lump collecting robot has a technical defect and damages the environment more than usual, and non-accidental and occurs directly from the normal operation and method of exploration or exploitation operations. Given that these damages occur in the region, i.e. beyond the national jurisdiction and territorial waters of governments, it is international pollution and cross-border damage. Although coastal states are relatively far from the region, the type of damage and pollution is such that, over time, the areas under their jurisdiction will be affected, especially considering the change in the food chain that could have a significant impact on the fishing industry (i.e. indirect damage). Therefore, the environmental damage caused by activity on the seabed is direct and indirect trans boundary material damage (Shiltoun & Kiss, 2014, p.108, 120).

The competent court to hear matters relating to the deep-sea area is the Maritime Disputes Division of the International Court of Maritime Law. According to Article 37 of the Statute of the International Court of the Law of the Sea, in addition to the authorities and States Parties to the Convention on the Law of the Sea, other entities (Which includes international organizations and private contractors) are permitted to refer to this branch to resolve their disputes concerning the region. All contractors can claim compensation for the environmental damage caused by the damage to their interests in the area; for example, the environmental damage caused by an explosion that destroys definite mineral resources in a designated area of operation by a particular contractor. Such compensation is conceivable in limited assumptions. However, the importance of environmental damage to the region as a common heritage of humanity is more than the benefit of a particular contractor, and the interests of all humanity, both present, and future, are at stake. This is where the position seems to be the best option for obtaining compensation from the importer of environmental damage to the area, because in addition to representing humanity in the region, the authority has legal personality as an international organization and,

under Article 176 of the Convention, has jurisdiction and can sue in the seabed disputes branch. Therefore, as a result of the favorable vote of the branch, compensation will be paid to the authority, and in that case, the decision will be made to allocate costs to compensate and repair the environmental damage caused by the authority as the representative of humanity in the region (Ckorrocola, Laul & Robinson, 2012).

4. Obligations and responsibilities of the perpetrators allowed to operate in the area

According to the provisions of the Convention on the Law of the Sea, in particular, paragraph 2 of Article 153, in the general classification, four institutions can be considered competent to exploit the resources of the seabed. These include the Authority through one of its constituents, the Broker, the States Parties to the Convention on the Law of the Sea, natural or legal persons (contractors under the auspices of the Supporting Government), and international organizations (Ibrahim Goul, n.d). In fact, the Convention provides a parallel system for exploring and exploiting the resources of the seabed, thus allowing different groups of active and passive international subjects to enjoy the benefits of this common human heritage.

Governments are allowed to operate in the region through membership in the Convention on the Law of the Sea. However, to explore and exploit the rich resources in the region, they must fulfill the obligations contained in the relevant convention and regulations. It is obvious that the violation of any of the obligations in the form of action or omission that causes environmental damage gives rise to the international responsibility of the violating government. In the meantime, the responsibility for the environmental damage caused by unauthorized acts should not be overlooked (Usui, et al, 2003,p. 93). Correspondingly, contractors also need to operate under one nationality or be effectively controlled and supervised by the sponsoring government.

1.4. Legal effects of international responsibility of governments



Once the international responsibility has been realized, the responsible government or international organization is obliged to compensate the damages. Therefore, the basic result and effect of liability is the commitment to full compensation. However, how to assess environmental damage and how to compensate for it, are among the issues that are mentioned below:

1.1.4. Damage Assessment

Estimating the damage to figures is very important in international law. But international law is difficult in the field of environmental damage because in many cases environmental elements can hardly be assessed with money. Undoubtedly, with the increasing importance of insurance and financial guarantees in the field of environment and its interaction with economic activities, we can expect that this legal field will witness development in the near future (Poorhashemi and Arghand ,2013).

2.1.4. Compensation Methods

According to the draft materials on liability, full compensation for the damage caused by the international wrongdoing takes the form of restoration to its former state, rejection of compensation and obtaining the satisfaction of the injured party separately or simultaneously. Basically, determining the method or methods and how to compensate is primarily in the competence of the countries or international organizations that are parties to the dispute and based on their agreement. Otherwise, the competent judicial authorities or international arbitrators have jurisdiction to hear these claims. Of course, the UN Security Council, as the case may be, has the authority to do so under Chapter VII of the Charter of the United Nations (Poorhashemi ,2020).

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2-4 Environmental Obligations of Governments on the Seabed

The obligations of governments must be defined regardless of their particular wealth or capabilities. National legislation should be enacted to oversee all seabed activities. Although customary international law contains principles that are considered in international environmental protection, the limits and criteria of these customary principles are not



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very precise. Some countries involved in sea bed mining have not yet made any specific legislation in this area in their domestic law such as India, France, South Korea, Brazil, Russia, and Poland. (Sparenberg ,2019).

The Convention on the Law of the Sea, as an international and specialized document on the marine environment, sets out many of these principles as a binding obligation for member states. Commitment to the protection of the environment is one of the most important commitments contained in the 1982 Convention on the Law of the Sea. This obligation is generally enshrined in Article 192 of the Convention on the Law of the Sea and Article 194 and obliges governments to take the necessary measures, individually and collectively, to prevent, reduce, and controlling the pollution of the marine environment by the best appropriate means at their disposal, and according to their financial and technical capabilities (Nandan, Satya, 2006).

The international responsibility of governments is established by non-compliance with environmental standards. Proper care by governments using existing facilities and capabilities leads to adherence to a more important commitment called the commitment to prevention, which is at the forefront of environmental commitments since, in most cases compensation is impossible. Accordingly, the common and different responsibility of governments is to protect the marine environment, which is a public commitment for all of them. But the quality of fulfillment of these commitments for different countries varies according to financial capabilities and technical infrastructures. Some of them are:

- ▶ Scientific and technical assistance of developed countries in order to support and protect the environment through technical training programs to developing countries.
- ▶ Contribute to knowledge production in the field of manufacturing related equipment.
- ▶ Environmental assessment training.

- ▶ Sales of equipment and technology to control or reduce the effects of environmental accidents.
- ▶ Providing the possibility of receiving financial facilities
- ▶ Financial support to establish new lab providing accurate environmental impact assessment (EIA)
- ▶ Working on new infrastructure in order to applying ecofriendly alternative solution
- ▶ considering to Green economy as vital part of environment preservation (Williams & Billon, 2017) & (Ali et al, 2017).

Another important commitment is the commitment to cooperate in the protection and preservation of the marine environment. Article 197 of the Convention obliges states to cooperate in this field at the regional and global levels. This obligation is a customary obligation that is strongly endorsed by international law due to its belief that it is binding. As stated in Chapter One, the environment has interconnected elements that provide the basis for Tran's boundary pollution and the widespread impact of environmental damage. This is precisely why the principle of co-operation in the field of protection and protection of the marine environment has received special attention in the Convention on the Law of the Sea. (Xue, 2003). The environment of the region is no exception to this rule. One of the manifestations of this cooperation in Article 198 is the principle of information. Thus, whenever the Contracting State becomes aware that the marine environment is in imminent or real danger, it shall inform the competent International Organization and the Governments which are likely to be harmed. In this regard, the governments in the affected area should cooperate as much as possible with competent international organizations to eliminate the effects of pollution and prevent and reduce injuries. Governments need to jointly prepare and approve emergency plans to deal with such incidents. In relation to the region, which on the one hand has an unknown and sensitive environment and on the other hand, is the common heritage of humanity and important for the international



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community, timely implementation of the principle of informing about environmental damage to the area, especially informing the authority as the oversight body, can be crucial. In this way, by taking timely decisions and actions following this information, it is possible to prevent further environmental damage to the region (Poisel, Tim , 2012).

Another important obligation of the Contracting Governments is to assist the Authority in overseeing the observance of the provisions of the Convention and the relevant laws by competent actors active in the region. Governments fulfill this obligation by ensuring compliance with regulations in the activities under their jurisdiction and oversight.

One of the environmental obligations of the Contracting States is the obligation to take precautionary measures and to implement the principle of prevention together. Pursuant to paragraph 1 of Article 194 of the Convention on the Law of the Sea, governments shall use the best possible means to prevent, reduce and contain environmental pollution from any source; That is, governments must consider both potential and definite environmental risks in their actions (Sharma, 2011).

Other necessary measures to be taken in accordance with Article 145 include the assessment of potential environmental impacts, a commitment to exercise the precautionary principle, and a commitment to use the best environmental performance in the seabed area (Sand, et al. 2012, p.140). In line with its commitment to the protection and preservation of the marine environment, the assessment of potential environmental impacts includes planned activities under the control or supervision of States under Article 206 of the Convention, if governments have good reason to believe that these activities may cause serious pollution or major changes to the marine environment, they should, to the extent practicable, evaluate the potential effects of such activities and report the results in the form of a published report or to the relevant organizations, including the International Seabed Authority. In the case of proposed activities related to the seabed area, this assessment must be submitted with the application for approval of the work plan (Anton, 2012).

The above assessment is of a predictive nature and it seems that the sponsoring government, based on its due diligence commitment, should ensure that this obligation is met by the supported contractor. But the Seabed Branch believes that the regulations on polymetallic agglomerates and the regulations on polymetallic sulfides create a direct obligation for the supporting government to assess the environmental impact. It goes on to say that this direct commitment, in addition to playing an important role in fulfilling the proper care commitment of the supporting government, is also related to the commitment to assist the authority. This means that the sponsoring government must both cooperate with the authority in this regard and use appropriate tools to ensure that such an obligation is met by the sponsored contractor (Steiner, 2015).

It then explains that this is a direct obligation under the convention on the law of the sea and a general obligation under customary international law (citing the Court's ruling in the Pulp Mill case). Using the tone used in the ruling of the International Court of Justice in the above case, this branch concludes that the obligation of the contractor and the sponsoring government is not limited to the specific scope of the regulations of polymetallic lumps and sulfides and goes beyond them (Nandan & Michael, 2016).

5. Guarantee to protect the marine environment in the event of an urgent order from the authority

The possibility of serious damage to the marine environment is not unexpected. According to the regulations of polymetallic agglomerates, polymetallic sulfides, and cobalt-rich layers, this damage is "any effect of activities in the region on the marine environment that represents a major adverse change in the marine environment that has been determined in accordance with the laws, regulations, and regulations approved by the authority and in accordance with internationally



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recognized standards and procedures"(Berge,Markussen, &Vigerust, 1999, p.112).

However, this important issue cannot be ignored, as the lack of transparency of the liability system in the Convention on the Law of the Sea complicates the precise determination of the responsibility of the supporting government and the commitment to compensation for environmental damage caused by the contractor. Given the commitments of the supporting government and its supportive relationship with the contractor, the performance of both should be considered in determining these matters. Here is an analysis of the four main assumptions regarding liability for breach of the obligations under the Convention on the Law of the Sea and related regulations by the sponsored contractor and the supporting government (Miles, 2007, p.54).

Hypothesis 1: Violation of obligations by the contractor leading to environmental damage and pollution, while the supporting government has fully fulfilled its obligations. Pursuant to paragraph 2 of Article 139 of the Convention, if the Supporting Government has fulfilled all its obligations to ensure due diligence to ensure compliance with the regulations, the Supporting Government will be exempt from liability and compensation for a non-causal relationship between damages and breach of the due diligence obligation. Therefore, the breach of the obligation made by the contractor is not attributable to the government, and as a result, the international responsibility for compensation for the breach lies with the contractor himself. This is emphasized in Article 22 of Annex III to the Convention.

Hypothesis 2: This hypothesis is related to the time when the contractor violates its obligations and this violation of the obligation leads to damages, with the difference that in this assumption, the supporting government has also failed to fulfill its obligations, but there is no causal link between the breach of the supporting government's commitment and the damage caused. Pursuant to paragraph 2 of Article 139 of the Convention on the Law of the Sea, in such circumstances the

international and civil liability of the Supporting State shall arise because of its failure to fulfill its obligation to ensure compliance with the Regulations, not because the private contractor failed to fulfill its obligations. The branch also argues that in order to hold the backing government liable, it is necessary, firstly, for damages and, secondly, for damages resulting from the failure of the backing government to fulfill its international obligations. It is obvious that this causal relationship cannot be assumed and needs to be proven. Therefore, if it is not proven as in the previous assumption, it is the contractor who will be responsible and guarantor (responsible for compensation), because although the damage has been done, there is no causal relationship between the damage and the government's failure.

Hypothesis 3: It is the case that the responsibility of the contractor and the supporting government is realized simultaneously; That is, firstly, both the contractor has violated the obligation and the supporting government, and secondly, a cause-and-effect relationship has been established between this breach of obligation and the damage caused. Unfortunately, the Convention does not specify liability and compensation in this case. According to the branch, if the contractor pays the actual amount of damages in accordance with Article 22 of Annex III to the Convention, there is no longer any opportunity for the supporting government to pay compensation. However, the situation becomes complicated when the contractor is not able to pay the compensation and is only able to compensate part of the damages. This situation indicates a gap in the system of international liability in the Convention and related laws, which leads to the creation of a situation called "irreparable damage". In expressing the written and oral opinions of the governments before issuing the advisory opinion, some governments believed that in such situations the supporting governments should have an additional responsibility to be compensated if the contractor is unable to pay the full compensation. However, the branch states that Article 139 of the Convention and the relevant regulations do not refer to this type of liability. As a result, this



theory has no legal basis, and what concerns the liability of the contractor and the supporting government as approved by the convention is a parallel liability. Of course, the branch does not clear the face of the issue that was not compensated, but to solve this problem, it proposes the authority, as the representative of all humanity and overseeing the activities of the region, establish a fund similar to the international funds created for pollution caused by dangerous activities such as oil and nuclear activities to compensate the damage to the area and the marine environment in the event of the polluter's financial inability to pay full compensation.

Hypothesis 4: The supporting government has failed to fulfill its obligations but has not suffered any damage. According to customary international law and Article 2 of the draft articles on the responsibility of states for international wrongdoing, the international responsibility of states is not conditional on material damage, but an international offense committed by a State occurs when, first, the conduct, whether act or omission, is attributable to that State under international law and, second, is considered a violation of that State's international obligation. However, in accordance with the provisions of Article 139 of the Convention on the Law of the Sea, the liability of the Supporting State for breach of its direct obligations, i.e. the obligation to ensure compliance with the Contractor under all rules and regulations, arises if damages are incurred (Marksmen , 1994). This form of international responsibility is in fact an exception to the basic rule of government responsibility mentioned above. Therefore, if the breach of the obligation by the supporting government does not cause damages, the supporting government will not be liable.

6. Looking to the Future

At the present time, one of the key factor is to improve product design, reduce demand, reuse raw materials, pay attention to the material recycling cycle, reclassify production materials, and use new renewable energy sources for production. In the field of metal extraction, this requires independent research and long-term planning

focusing on the analysis of the life cycle of metals. It is equally important to improve product design, reduce demand, reuse raw materials, pay attention to the material recycling cycle, reclassify production materials and use new renewable energy. Also, new technologies that allow the replacement of new sources of metals such as lithium, silver, neodymium and dispersion with older metals and sources (Levin, Amon, & Lily, H. 2020).

Conclusion

The main concern of this paper is what environmental legal system can address the gaps in international environmental law for the effective protection of the marine ecosystem and the environmental responsibilities of governments in extracting and exploring seabed resources? According to the topics presented in the above research, which are about the agents allowed to exploit and explore the seabed and international systems of responsibility in environmental issues and the common theory of Jo seran & sali, it can be answered as follows:

None of the international systems of responsibility alone can be responsible for resolving environmental crises, especially in the field of exploration and mining of the seabed, and only localized hybrid environmental systems, taking into account the ecological potential of the region, can Protection is effective. Also, considering the unknown and vulnerable environment of the region, it is recommended to establish a multidimensional international environmental responsibility system with a sustainable development approach in this region. On the other hand, it is appropriate that this system has coherent legal rules in order to prevent and fully compensate for the damage caused by exploration and exploitation in the seabed. Previous experiences in compensating for environmental damage have shown that their full compensation has been impractical.

The author believes that with the establishment of an International Fund for Environmental Compensation, an important step can be taken



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to finance it so that the beneficiary countries by allocating a percentage of revenues and profits from the extraction of mineral resources and other Minerals in the seabed contribute to this environmental social responsibility fund. In addition, the lack of funding sources in the field of damage and pollution of the marine ecosystem, the issue of conflict and conflict of interest of the operating and beneficiary governments, as well as the lack of integrated jurisprudence and the lack of quorum to negotiate are among these major challenges (Van Dover et al, 2017).



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Glossary:

Alternative energy sources

Energy that does not come from fossil fuels (such as coal, oil, gas), for example wind, flowing water, solar energy and biomass.

Biodiversity

A short form of the phrase 'biological diversity', which means the variety of life on this planet and how it interacts within habitats and ecosystems. Biodiversity covers all plants, animals and micro-organisms on land and in water. See also ecosystem, habitat and organism.



Carbon dioxide (CO₂)

A colorless gas that is naturally produced from animals and people in exhaled air and the decay of plants. It is removed from the atmosphere by photosynthesis in plants and by dissolving in water, especially on the surface of oceans. The use of fossil fuels for energy is increasing the concentration of carbon dioxide in the atmosphere, which is believed to contribute to global warming. See also greenhouse gases and photosynthesis.

Conservation

Preserving or protecting animals and resources such as minerals, water and plants through planned action (such as breeding endangered species) or non-action (such as not letting taps run unnecessarily).

Damage

A deterioration in the quality of the environment not directly attributable to depletion or pollution.

Disposal, dispose of

In this guide, getting rid of waste by discarding it into a bin and, when it is collected, by incinerating it or sending it to landfill.

Ecosystem

A community of organisms that depend on each other and the environment they inhabit.

Environmental Impact

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. An environmental impact addresses an environmental problem.

Environmental impact statement

A statement about the expected effects on the environment of a proposed project or development such as a new road or waste water

treatment plant, including how any severe effects on the environment will be addressed.

Flora and fauna

The plants and animals that are native to a particular area or period of time.

Kyoto Protocol, Kyoto agreement

An international agreement signed in Japan in 1997, attached to the UN Framework Convention on Climate Change. Under the agreement, which has been in force in Ireland since 2005, industrialised countries promised to reduce their combined greenhouse gas emissions to at least 5 percent below 1990 levels over the period 2008-2012. See also UN Framework Convention on Climate Change.

Organism

Any living thing, from bacteria and fungi through to insects, plants, animals and humans.

Sustainable development

Development using land or energy sources in a way that meets the needs of people today without reducing the ability of future generations to meet their own needs.