

# “Protection and Conservation of the Living Resources of the Area”

Frida M. ARMAS-PFIRTER

Member Legal and Technical Commission of the International Seabed Authority

e-mail: [fza@mrecic.gov.ar](mailto:fza@mrecic.gov.ar)

**ABSTRACT:** *The paper will develop several considerations regarding the living organisms hosted by the minerals found at the deep sea and the fact that, as each mineral resource has particular characteristics and components, the living organisms that live inextricably bound to them are different. If we take a look at the vent ecosystem, we find that the last stages of the food chain of the hydrothermal vents ecosystem –like the fish and octopuses- are resources of the high seas due to the fact that although they feed from – among others- vent organisms, they are able to swim and move to shallower and sunnier waters when needed. They share the vent ecosystem, but they are independent of it. But the situation at the base of the food chain and that of the secondary producers is very different from the one mentioned above. Actually, they do not seem to be high seas resources. They represent in the Area equivalent organisms to the sedentary species, which in zones under national jurisdiction, appertain to the continental shelf and not to the exclusive economic zone. Indeed, they are much more related to the seabed and subsoil than those of the continental shelf, since they can only live in symbiosis with the minerals of the vent.*

*Considering that UNCLOS specifically refers to minerals different from polymetallic nodules and to their regulation, we could conclude that the hydrothermal vents and the activities involving them are contemplated in the Convention. Nevertheless, the legal status of the associated biological communities - that is whether they are free or they belong to the common heritage of mankind- is not specifically considered.*

*The consequences of the omission are examined taking into account that the status of common heritage of mankind to the Area and its resources were declared by Resolution 2749 (XXV) of the General Assembly of United Nations and the historic moment when the regime of UNCLOS for the resources of the Area were adopted are made.*

*Even if the right of the Authority to protect and preserve the natural resources in the Area may help providing some protection to these resources, it is impossible to conceive the protection of the “sedentary species of the Area” separately from the activities related to the mineral resources. If the legal status of the former, that is whether they are free or belong to the common heritage of mankind is not clarified, many problems will arise in the management of both of them.*

## 1 - INTRODUCTION

The exploration of the oceans is as challenging and fascinating as the discoveries in outer space. In parallel with the negotiations of the III United Nations Conference on the Law of the Sea and after the adoption of UNCLOS, important advances in the technology of exploration and exploitation of the seabed were taking place, providing unexpected knowledge of the wealth of the deep ocean. The mineral deposits that are known to be significant in the deep seabed, that is in the Area, include nodules, crusts, sulphides, hydrates, oil, phosphorites and aggregates, and there may possibly be other substances yet undiscovered. Not only are the newly discovered mineral resources of the deep seabed attracting attention for their economic potential, but also the genetic resources associated with certain marine minerals are becoming the center of attention for their scientific as well as economic significance.

Actually, due to the changes in the international market conditions and the technical difficulties that arose in connexion with the exploitation of the polymetallic nodules, it is unlikely that these and other mineral resources will be commercially developed for many years. Nevertheless, the genetic resources that were discovered while UNCLOS was being

negotiated have provoked great scientific and economic interest and could be the first ones to be exploited.

## **2 - MARITIME ZONES INVOLVED**

Beyond the national jurisdiction there are two different maritime zones: high seas and the Area each of them with its particular legal status.

High seas are defined in UNCLOS in a negative way, as all parts of the sea that are not included in zones under national jurisdiction.

High seas are open to all States. But, even though the resources of the high seas can freely become the property of those who exploit them, this freedom must be exercised under the conditions laid down by UNCLOS and by other rules of international law. It is expressly established that the freedoms of the high seas shall be exercised with due regard for the rights granted under UNCLOS with respect to activities in the Area

The Area is specifically defined in the first article of the Convention, as the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction and activities in the Area are defined as all activities of exploration for, and exploitation of, the resources of the Area.

So, as we can see:

- The Area is a determined geographic zone, different from high seas.
- Both of them are zones that extend beyond national jurisdiction but their boundaries do not always coincide, since we can find continental shelf under high seas.
- As regards its legal status, in 1970 the General Assembly of the United Nations declared that the seabed, the ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction as well as the resources of the Area are common heritage of mankind. As a result of this status, the Area shall not be subject to appropriation and no State shall claim or exercise sovereignty or sovereign rights over any part thereof. The exploration of the Area and of its resources shall be carried out for the benefit of mankind as a whole and, for this purpose, the Resolution calls for an international regime to be established including appropriate international machinery.

It is also established that the general conduct of States in relation to the Area shall be in accordance with the provisions of this Part, the principles embodied in the Charter of the United Nations and other rules of international law in order to maintain peace and security and promote international cooperation and mutual understanding. Besides, the Area shall be open to use exclusively for peaceful purposes by all States.

Part XI of UNCLOS maintains this concept and provides the regime to be applied to the Area and its resources and established that the Authority shall act on behalf humankind.

The Convention specifically defines the meaning of resources for the purposes of application of the regime set out in Part XI: “resources” mean all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the seabed, including polymetallic nodules. The resources, when recovered from the Area, are referred to as “minerals”.

Even though the polymetallic nodules were the main reason to negotiate the regime set forth in Part XI, the activities related to the exploration and exploitation of other minerals, such as the cobalt-rich ferromanganese crusts and the polymetallic sulphides located on the hydrothermal vents were already foreseen in those times, and therefore included in the

definition of resources of article 133 among the minerals different from polymetallic nodules in respect of which the Authority has the obligation to adopt rules as stated in article 162.

### **3 - INTERNATIONAL SEABED AUTHORITY**

The International Seabed Authority, an intergovernmental organization, was created by the Convention as the autonomous body through which States Parties shall organize and control activities in the Area, with the specific aim to manage its resources.

According to the mandate provided by the Convention and the Agreement, the Authority elaborates and adopts rules, regulations and procedures for exploration of minerals of the deep seabed. Such rules, regulations and procedures shall incorporate applicable standards for the protection and preservation of the marine environment.

The Authority has already adopted the “Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area” - the Mining Code- and, in accordance with it, entered into the first 15-year contracts for exploration for polymetallic nodules with the seven pioneer investors. One of the consequences of the existence of such a contractual relationship is the obligation on contractors to submit annual reports in accordance with the provisions of the contract. In that regard, the standard clauses set out in annex 4 to the Regulations contain detailed provisions relating to the format and content of such annual reports. The objective of these reporting requirements is to establish a mechanism whereby the Authority, and particularly the Legal and Technical Commission, can be provided with the information necessary to carry out its responsibilities under the Convention, particularly those relating to the protection of the marine environment from the harmful effects of activities in the Area.

In 2001, the Legal and Technical Commission adopted the “Recommendations for the Guidance of the Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Polymetallic Nodules in the Area”. The purpose of the recommendations is to describe the procedures to be followed in the acquisition of baseline data by contractors, including the monitoring to be performed during or after any activities having the potential to cause serious harm to the environment, and to facilitate reporting by contractors. The aim is to define the biological, chemical, geological and physical components to be measured and the procedures to be followed by the Contractor to ensure the effective protection of the marine environment from harmful effects which may arise from its activities in the Area, and to provide guidance to prospective contractors in preparing plans of work for exploration for polymetallic nodules.

In 1998, the Russian Federation noted that, in addition to polymetallic nodules, other mineral resources of the Area existed, including hydrothermal polymetallic sulphides and cobalt-bearing crusts. In accordance with article 162<sup>1</sup> of the Convention, the Russian Federation requested the Authority to adopt, within a period of three years, rules, regulations and procedures for exploration for hydrothermal polymetallic sulphides and cobalt-bearing crusts.

Currently the Authority is drafting the rules and regulations for the exploration of these minerals. The LTC began its consideration, using, as a basis for its discussions, the paper prepared by the secretariat for the Council in 2001 (ISBA/7/C/2).

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<sup>1</sup> paragraph 2 (o) (ii)



## **4 - MINERAL RESOURCES OF THE SEABED AND THEIR RELATED LIVING ORGANISMS**

The polymetallic nodules, the cobalt-rich ferromanganese crusts and the polymetallic sulphides are the deep sea minerals that seem to have higher economic value and, as we have already said, the Authority is working on their regulation. All these minerals host living organisms that are closely related to them but as each mineral resource has particular characteristics and components, the living organisms that live inextricably bound to them are different; especially those hosted by the polymetallic sulphides which have their own features and potential economic value independent of their hosting mineral.

We are going to refer briefly to the special characteristics of the sulphides and their ecosystem.

## **5 - POLYMETALLIC SULPHIDES**

The polymetallic sulphides of the hydrothermal vents were discovered in 1977, on the Galapagos Rift off the coast of Ecuador, at a depth of 2,500m. The existence of the geothermal vents was predicted at the beginning of the seventies, because water sampling studies along the Galapagos Rift indicated some kind of vents. But what was really unexpected and amazing was the discovery of abundant sea life related to these hot springs, about which we are referring immediately.

More than 100 vent fields have been studied in different parts along the global mid-ocean ridge system, covering only 5% of its total surface (60000 km). Only about 10 deposits among them may have sufficient size and grade to be considered for future mining, although information on the thickness of most of those sulphide deposits is not yet available. All of these sites except two are located in the exclusive economic zone.

It is considered that mining of seafloor polymetallic sulphides is likely to take place in the current decade, but probably the deposits situated in the exclusive economic zone, in shallower waters will be exploited sooner.

Cold seawater penetrates deep into cracks in the earth's crust so, when it approaches the magma -which in these areas is close to the subsoil- it is heated up to 300-400°C. At this point, it becomes extremely corrosive, capable of dissolving the basaltic rock and leaching out metals and other elements, thus becoming enriched with a variety of mineral compounds. By the time it approaches to the ocean floor again, this water has become a mineral-rich hydrothermal solution, and this superheated fluid rises and bursts out into the ocean again through holes in the seafloor.

This fluid mixes with cold ocean bottom seawater -at 2°C- and with the cold and pressure, the vent water cools and dumps its load of minerals constructing mineral chimney-like structures in the fissure, from which hot fluids and precipitated particles escape.

At the same time sulphide minerals precipitate from the hydrothermal solution as small particles appearing as "black smoke", a black cloud of tiny metallic sulphide particles. These particles precipitate out of the hot vent fluid as it mixes with the cold seawater on and around the chimney, the end product being a sulphide mound.

They are called the smokers because they resemble factory smokestacks. The smokers can be black, white or grey, depending on the material being ejected. The black ones often emit particles that are rich in sulphides, lead, cobalt, zinc, copper, gold and silver; the white ones spit out streams of gypsum and zinc, rather than sulphides. They also contain smaller amount

of iron and copper than the previous ones. A deposit found in the exclusive economic zone of Papua New Guinea is the most gold-rich seafloor deposit found to date. Maximum gold concentrations in samples collected there, at Conical Seamount, range up to 230 g/t with an average of 26 g/t, which is about ten times the average value for economically mineable gold deposits on land.

The chimneys can grow more than 10 meters high. One black smoker on the eastern side of the Mid Atlantic Ridge, at 3,650 meters depth, measures more than 48 m in high and 182 m in diameter. Some deposits can contain approximately 100 million metric tons, competing with giant ore bodies on land, although most marine deposits are much smaller.

Sometimes the structures fall, but chimneys can grow back very quickly; some of them grow up to 9 m in 18 months. Hydrothermal vents can last for ten to one hundred years but, when the physical conditions change, some of them turn off and fade away, while new ones are born .

In addition to the chimney structures, vent heated water may also appear as a diffuse flow around the vent field. In fact, sometimes the superheated rising water mixes with cold seawater before emerging onto the seafloor and forms diffuse vent areas, with warm water over a large area but does not build sulphide chimneys. There, the environment is the same as in the vents.

## **6 - HYDROTHERMAL VENTS ECOSYSTEM**

In the deep ocean, water is cold and darkness surrounds everything. Sunlight only penetrates up to approximately 300 meters under the water, which is very little compared with the depth of the oceans. Plants are the base of the food chain on land and on shallower waters; they transform inorganic matter into organic by photosynthesis, which is carried out thanks to solar energy. But on the deep ocean floor there is no sunlight so, as life is in close relation with the energy of the sun, the flora and fauna is scanty, everything looks like a desert. The sparse animals of the deep ecosystem feed from sediments that fall from surface waters, that is from a small part of the phytoplankton originated in the shallower waters that reaches the deep ocean floor, where it becomes food for the living resources of the sea bed.

Until the discovery of the hydrothermal vents, it was believed that the base of the food chain of all the ecosystems of the deep sea bed were the plants that go down as sediments. On the vent communities, the base of the ecosystem food chain is a sulphide-oxidising bacteria which comes up with the water. And the energy source is not sunlight; this is a chemosynthetic ecosystem, because the bacteria transforms compounds dissolved in the hot springs into energy through chemiosynthesis.

In these hydrothermal vents we discover an amazing change in the circumstances of the life around them. At this depth only sparse animals can be found, about twenty worms and stars per square meter. On the other hand, around the vents there can be a million animals in a surface of the same size. That is the reason why they are called oases in the desert of the deep oceans.

Hydrothermal vents are also rich in biodiversity, nearly 500 new animal species have been identified, more than 90 per cent of which are not found anywhere else. This marine ecosystem is probably one of the most productive ones, and it is largely independent of the sun. Apart from the lack of sunlight, there is a very hostile environment -little oxygen, high temperatures, and high concentration of sulphide- which would make life impossible for most of the living species on earth. As it was said, the physical and chemical characteristics of vent

systems are extreme in terms of temperature, pressure, PH and toxic levels of metal and gases, which are very similar to environmental conditions existing on Earth billions of years ago.

The food web of the vent communities is short; some of the species found on the vents of the Pacific Ocean differ from the ones found on the Atlantic Ocean.

- Base of the food chain: The sulphide-oxidising bacteria that reside in and on the “chimneys” thrown up from the seabed itself. These micro-organisms act as the biological interface with the deep seabed’s extreme physical and chemical environments and can be free-living or symbiotic. They are also called hyperthermophiles, and are unique because of their capacity to grow at very high temperatures.
- Secondary producers:
  - Tube worms: founded in the Pacific vents, they can reach 3 meters. They are the fastest growing marine invertebrate known, they can grow 1-2 mm per day. They live in a symbiotic relationship with the billions of bacteria packed inside each of them.
  - Mussels
  - Clams
  - The blind Atlantic vent shrimp, discovered in 1985 in the Mid-Atlantic Ridge. Tiny, they use their claws to scrape bacteria from chimneys and stuff them into their mouths. They have like “visual organs” that detect infrared radiation from the hot vents
  - Snails
  - Crabs
- Fishes and octopusses

The last stages of the food chain of the hydrothermal vents ecosystem –like the fish and octopuses- are resources of the high seas due to the fact that although they feed from – among others- vent organisms, they are able to swim and move to shallower and sunnier waters when needed. They share the vent ecosystem, but they are independent of it.

But the situation at the base of the food chain - (*that is to say*) the bacteria that come with the boiling and sulphidic water of the hydrothermal vents- and that of the secondary producers - (*that is*) the typical marine worms, the mussels, the giant clams and the eyeless shrimps that can’t go far away from the warm water which is their environment, feeding from the bacteria only- is very different from the one mentioned above. Actually, they do not seem to be high seas resources.

They represent in the Area equivalent organisms to the sedentary species, which in zones under national jurisdiction, appertain to the continental shelf and not to the exclusive economic zone. Like the sedentary species, they are either immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil. Indeed, they are much more related to the seabed and subsoil than those of the continental shelf, since the species we are referring to simply cannot survive without such permanent physical contact, without the heat and sulphidic water of the hydrothermal vents; that is to say, they can only live in symbiosis with the vent.

When the hydrothermal vents turn off, the bacteria and other organisms must move because without the sulphides and warm water they may die in the short term. It remains unclear how the vent organisms move from one vent to a new one, perhaps many miles away in an extreme environment and how they settle in the new place.

## **7 - IMPORTANCE**

Looking into the future, this ecosystem has been increasingly considered as a source of scientific discoveries and commercial benefits but, actually, since the knowledge of the biodiversity of the seabed and of the hyperthermophiles is in its early years, we simply do not know what other interesting organisms may exist and what potential uses and commercial value may have. However, up to the moment, the following are considered the main fields for their application:

- These organisms which were called Archaea are a third branch of the tree of life, they are cells without a nucleus but more than half of their genes are unlike anything else on earth and were new to science. Archaea are found in different environments, such as volcanoes, geysers, hot springs and ocean vents, the common factor being the presence of great heat. Scientists speculate that the bacteria may represent descendants of some of the earliest life forms to have inhabited the planet,
- Medical applications: the research carried out on the special haemoglobin developed by tube-worms may lead to producing artificial blood
- Industrial: enzymes and bioactive compounds can be extracted from microbes living in the vents and which can be used in a number of industrial processes. In fact, it is important to highlight that 7 or 8 enzymes currently patented were developed from microbes found in hydrothermal vents. The thermostable properties of the enzymes from the microbes (hyperthermophiles) -they exist and thrive at extremely high temperatures- are very useful for applications in waste treatment, food processing, oil well services, paper processing and ore processing in the mining industry (biomining). Their market value has been estimated between USD 600 million and USD 3 billion per year. As patents have been taken out in relation to substances obtained from processing the vent's biological resources, the access to such substances and to the benefits from the commercial exploitation of them by the international community as a whole is being limited.
- Regulation of temperature and chemical balance of the oceans.

## **8 - THREATS**

The hydrothermal vents are particularly sensitive owing to their high percentage of endemic species and the exceptional nature of many of the species found there. Research and exploitation of both living and non-living resources may disturb and endanger interrelated populations of rare species and organisms. The most important threats are:

- Intensive scientific exploration
- Bioprospecting: harvesting for commercial purposes of the genetic resources.
- Mining activities

## **9 - LEGAL FRAMEWORK**

The problem is that UNCLOS does not contain specific provisions on the legal status nor on the possible economic exploitation of these biological communities associated to the vents. As we have said at the beginning, resources for the purposes of Part XI are only the mineral ones.

Despite the fact that these organisms are not mentioned in UNCLOS, such omission should not lead us to think that they will fall within the high seas legal regime and that, consequently,

are accessible to all under the conditions laid down by UNCLOS. They are located in the Area, a maritime zone that differs from high seas in its legal status, in the management of its resources and even in the way in which such general activities like marine scientific research and the protection of the environment are regulated. Also, they don't have similar characteristics as the living resources of the high seas, as we have already said; they are like the sedentary species.

On the other hand, does the fact that they are not explicitly mentioned in the Convention mean that they are completely unregulated?

Whichever conclusion we reach, we have to take into account three important facts

First, we cannot forget that the Area and its resources were declared common heritage of mankind in 1970 by the Resolution 2749 of the General Assembly of United Nations. UNCLOS maintains this concept and affirms that no State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or natural or juridical person appropriate any part thereof and that all rights in the resources of the Area are vested in mankind as a whole, on whose behalf the Authority shall act.

For the purposes of Part XI, where the international mechanism called by Resolution 2749 is set, "resources" means all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the seabed.

Second, when we look through the Acts and Documents of the Committee on the Peaceful Uses of the Seabed and the Ocean Floor beyond the Limits of National Jurisdiction and of the III UN Conference on the LOS, we find:

- Some delegations, specially the first years after the adoption of Resolution 2749, interpreted that the resources of the seabed were the same as those of the continental shelf, that is, minerals and sedentary species. And they proposed the same definition contained in the 1958 Convention of the Continental Shelf
- It was pointed out the lack of knowledge about any species existing at a substantial depth. For example, a working paper submitted by the United Kingdom expressed "We do not at present know of any sedentary living resource existing at substantial depth". And Canada: "Significant living seabed resources would be within the outer limits of the continental margin"
- The main interest was the economic value of the minerals of the deep seabed and the influence that their exploitation would have for the importers and exporters of the same minerals produced on earth; so then all the arguments concentrated around the mining activity.
- Some countries attempted to include the living resources of the water column into the regime of CHM, with the obvious opposition of most of the delegations, who defended the freedom of fishing in the high seas.
- But we can not either find in the negotiations of the III Conference or on the work of the, an attempt to assimilate these sedentary species of the seabed to the high seas regime.

And above all, it is very important to take into account that in 1977, when the hydrothermal vents and their ecosystem were discovered, the definition of resources for the purposes of application of Part XI had already been adopted. Indeed, in the Fourth Session in 1976 it was established that: "Resources means mineral resources in situ" and from then on the same definition was repeated. Even if five years of negotiations ensued after the hydrothermal vents were discovered, nobody ignores that on the one hand, the problems that the negotiators had



to face were so hard that it was absolutely impossible even to think about reopening the agreement that had been reached. And on the other, it has never been easy for scientific knowledge and its bearing upon laws and regulations to be quickly understood and incorporated into a current negotiation.

Other two activities closely related to the hydrothermal vent ecosystem are marine scientific research and environmental protection. Let see the provisions in UNCLOS.

## **9 - MARINE SCIENTIFIC RESEARCH**

All States and competent international organizations have the right to conduct marine scientific research in the Area, but with the stipulation that such research is to be conducted in conformity with the provisions of Part XI of UNCLOS, where it is established specifically that it shall be carried out exclusively for peaceful purposes and for the benefit of humankind as a whole. This means that, unlike the situation in the high seas, marine scientific research in the Area can't be carried out for the sole benefit of the researcher, which is another consequence of the difference between the common use of the high seas and the common heritage of mankind of the Area. Thinking about scientific research for the benefit of mankind we immediately refer to the publication and dissemination of research results, and exchange of samples between researchers.

The Authority may carry out marine scientific research concerning the Area and its resources, and may enter into contracts for that purpose. The Authority shall promote and encourage the conduct of marine scientific research in the Area, and shall coordinate and disseminate the results of such research and analysis when available.

As one author has pointed out, it has to be carefully studied whether marine scientific research which passes to industry for commercial use of organisms collected from the Area constitutes marine scientific research that benefits mankind as a whole<sup>2</sup>.

## **10 - ENVIRONMENTAL PROTECTION**

Under UNCLOS, States has the general obligation “to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life”.

Even though the legal status of the vent communities is not contemplated, its protection is considered, in general, in the framework of article 145 which provides that the Authority shall adopt appropriate rules, regulations and procedures for the protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna of the marine environment.

Since its establishment in 1994, the Authority has kept environmental protection as one of its highest priorities, evidenced by the comprehensive regime for monitoring and protecting the marine environment in the Area established in the Mining Code and also by the adoption of the Environmental Guidelines by the Legal and Technical Commission of the Authority.

We must remember that nowadays, more than in 1982, the development of the international environmental law lead to the priority in the application of precautionary approach to ocean management.

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<sup>2</sup> GLOWKA, 1999, p. 81-82.

## CONCLUSIONS

Considering that UNCLOS specifically refers to minerals different from polymetallic nodules and to their regulation, we could conclude that the hydrothermal vents and the activities involving them are contemplated in the Convention. Nevertheless, the legal status of the associated biological communities - that is whether they are free or they belong to the common heritage of mankind- is not considered.

Clearly, the organisms that compose the ecosystem of the hydrothermal vents are not resources of the superjacent waters. They are like the sedentary species of the continental shelf.

Article 145 contemplates its protection since it imposes the right of the Authority to protect and preserve the natural resources in the Area, and specially prevent any damage to the marine flora and fauna.

However, it is impossible to conceive the protection of the “sedentary species of the Area”, the fauna of the deep sea, separately from the activities related to the mineral resources in the same Area. If the legal status of the former, that is whether they are free or belong to the common heritage of mankind, is not clarified many problems will arise in the management of both of them, such as:

- How should the Authority grant exclusive exploration licenses for minerals and make that compatible with research carried out by biologists at the same vents?
- How can the interest of private enterprises or States which are profiting from the living resources be compatible with the interest of those explorers who are exploring the minerals of the hydrothermal vents?
- How can free biological samples, which cause damage to the vent ecosystem, be allowed if the marine scientific research in the Area must be carried out for the benefit of all mankind?
- How can the tensions that will naturally result from the above mentioned opposed interests be managed bearing in mind the main principle of peaceful use of the Area?

In brief, since the regulation that, in some way, refers specifically to the “sedentary species of the seabed” is art. 145 of UNCLOS, we must work on its implementation through the adoption by the Authority of appropriate rules and regulations. It must be taken into account that the last General Assembly Resolution on Oceans and the Law of The Sea, reiterates the importance of the ongoing elaboration by the Authority, pursuant to article 145 of the Convention, of rules, regulations and procedures to ensure the effective protection of the marine environment, the protection and conservation of the natural resources of the Area and the prevention of damage to its flora and fauna from harmful effects that may arise from activities in the Area (A/RES/57/141, para 16)

Notwithstanding this, it is advisable to work on the drafting of provisions aimed at preserving the basic concept of the common heritage of mankind of the Area and its resources through the fair and equitable utilization of its genetic resources.

One of the presentations at the 20<sup>th</sup> Anniversary of UNCLOS, as well as some authors-suggested that “An international regime to promote and safeguard the fair and equitable sharing of benefits arising from the utilization of genetic resources is to be negotiated”<sup>3</sup>.

#### **BIOGRAPHY:**

- Degree in Law (LL.B.). Argentine Catholic University
- PH.D. in Law. University of Buenos Aires. Doctoral Thesis on "International Law of Fisheries and its application to the River Plate Maritime Front". Approved with *Summa cum Laude* and distinguished with the “University of Buenos Aires Award”.
- Co-ordinator of the Argentine Commission on the Outer Limit of the Continental Shelf.
- Member of the Legal and Technical Commission of the International Seabed Authority (Kingston, Jamaica). Elected Vice-Chairman for the periods 2002-2003 and 2003-2004.
- Professor of Public International Law, Austral University.
- Author of three books and articles related to international law, in national and international journals or collective books.
- Formerly, Consultant of the Inter-American Development Bank, Legal Adviser to the Argentine Supreme Court of Justice, Member of the Argentine delegation to different international meetings: the Fifth, Sixth, Seven, Eight and Ninth Sessions of the International Seabed Authority (Kingston, Jamaica), Open Meeting of the Commission on the Limits of the Continental Shelf (United Nations, New York) and FAO Technical Meeting for a Code of Conduct for Responsible Fishing (Rome).
- Scholarships for postgraduate studies awarded by the United Nations University, the Hague Academy of International Law, the Organization of the American States (OAS), the International Law Commission of the United Nations (Geneva) and the Inter-American Institute of Human Rights (Costa Rica).
- Lecturer at conferences and seminars in national and foreign institutions.

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<sup>3</sup> GOETTSCHÉ-WANLI, Gabriele, “Legal instruments that support the implementation of the United Nations Convention on the Law of the Sea”, DOALOS/UNITAR, *Briefing on Developments in Ocean Affairs and the Law of the Sea 20 Years after the Conclusion of the United Nations Convention on the Law of the Sea*, September 2002, New York, [http://www.un.org/Depts/los/convention\\_agreements/convention\\_20years/briefingmaterial.htm](http://www.un.org/Depts/los/convention_agreements/convention_20years/briefingmaterial.htm).