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Legal Issues Concerning
Conservation and Protection of
Marine Genetic Resources of the
Deep-Sea under International Law

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Summary

The thesis is concerned with the protection of the marine genetic resources of the deep-sea within and beyond the areas of national jurisdiction of the coastal States. The paper underlines the importance of the resources for the industrial sector, such as pharmacies, cosmetics and other fields of biotechnology, as well as its value for the humanity. As it is observed, despite the outrageous number of global and regional International Conventions on environmental law none of them is found to be directly applicable to the marine genetic resources and the activities related to them. This loophole in the international legal framework become the concern of the whole international community and numbers of international bodies engaged in on-going discussions whether or not there was a need steps to be taken and if so what would they constitute.

The paper discusses all the possible applicable regimes to the Marine Genetic Resources of the deep-sea under two major Conventions: United Nations Convention on the Law of the Sea and the Convention on Biological Diversity. Also focuses on International Environmental Principles elaborated in different legal instruments. However, author concludes on the insufficiency of such decentralized, disorganized and overlapping legal documents applicable to MGR and thus seeks for the possible solutions.

The paper provides the critical analysis to some of the proposed possible solutions to the problem for filling up the loophole in the legal framework. The conclusion is made that adoption of Implementation Agreement to UNCLOS would be the best solution among the possibilities. The paper is an attempt to underline through analysis of the benefits of the different regimes and principles such as principle of Common Heritage of Mankind - elaborated in three different Conventions, precautionary principle ensured in Rio and Stockholm Declarations and in other legal instruments and international court decisions, Environmental Impact Assessment requirement under Protocol of Antarctic Treaty and several other principles and guidelines to point out what the new Implementation Agreement of UNCLOS should look like and what are the core principles it should observe. Agreement is basically bringing together already well-examined principles and practices in different aspects that are closely connected to MGR.

KEY WORDS: marine genetic resources; UNCLOS; CHM; Implementation Agreement; CBD; International Seabed Authority

Preface

This thesis represents the final step of the two-year unforgettable experience of my life. The idea of the topic came from one of the interesting lectures carried out by visiting Professor Galo Carrera, who encouraged me to go into the deep analysis of the current situation in terms of marine genetic resources and to whom I am so much grateful for that.

Several persons played an important role in finalizing this thesis as well as in general making me being so much in love with the law of the sea. For that reason I would like especially to thank my supervisor Dr Chie Kojima, who from a long distance and despite her health conditions at the time of writing the thesis agreed to continue my supervising and provided with excellent guidance. I would also like to thank Professor Proshanto K. Mukherjee, Dr. Abhinayan Basu Bal and Olena Bokareva for their time, valuable lectures and the support during the whole programme.

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I would like to show my special gratitude to my parents and sister who where supporting me during the whole master programme and encouraged me to continue my studies abroad despite the fact that they were missing me all the time. Also I would like to thank my friends who where always there for me despite the long distance, special thank goes to Salome A., Salome G., Sophie, Lela, Eka, Lasha, Beka and Aka. And finally but the most I would like to thank my fiancé Avtandil Kasradze for the support during last four years.

Abbreviations

ABNJ	Areas Beyond National Jurisdiction
BAT	Best Available Techniques
BEP	Best Environmental Practice
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Governing Body of the Convention on Biological Diversity
CS	Continental Shelf
DNA	Deoxyribonucleic Acid
Doc	Document
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organisation
G77	Group of 77
GEF	Global Environmental Facility
GNP	Gross National Product
HS	High Seas
i.e.	id est
ICJ	International Court of Justice
IPR	Intellectual Property Rights
ISA	International Seabed Authority
ITLOS	International Tribunal for the Law of the Sea
IUCN	International Union for Conservation of Nature
IUU Fishing	Illegal, Unreported, Unregulated Fishing
Km	kilometre
m	meter
mg	milligram
MPA	Marine Protected Areas
MSR	Marine Scientific Research
PIC	Prior Informed Consent
RFMO	Regional Fisheries Management Organization

TS	Territorial Sea
UN	United Nations
UNCLOS	United Nations Convention for the Law of the Sea
UNCLOS III	United Nations Conference for the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNICPOLOS	United Nations Open-Ended Informal Consultative Process on Ocean and Law of the Sea
UNSG	United Nations Secretary-General
UNTS	United Nations Treaty Series
UNU-IAS	United Nations University - Institute of Advanced Studies
USA/US	United States of America
USD	United States Dollar
USSR	Union of Soviet Socialist Republics
v.	Versus
WHOI	Woods Hole Oceanographic Institution
WIPO	World Intellectual Property Organisation
Working Group	Ad Hoc Open-Ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction
WTO	World Trade Organisation
WWF	World Wide Fund for Nature

1 Introduction

1.1 Background

*There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society where none intrudes,
By the deep sea, and music in its roar.*

Lord George Gordon Byron

Oceans cover more than 70 per cent of the earth and inhabit millions of different types of species most part of which besides the long time interest in oceans has not been yet discovered. For thousands of years it was believed that there was no life into the deep-sea that was full of darkness and mystery. However, developments lead men to collection of more information about the oceans and its resources. Higher the economic interest in the exploitation of the resources of the sea, more and more nations engaged into these activities. Main interest of States was exploitation of the non-living resources of the seabed, such as polymetallic nodules, oil and gas. The former due to the costs needed for its exploitation ceases to be economically attractive.¹ It was not until 1970s that the first hydrothermal vent has been discovered in the Galápagos Rift, which is located nearly 640 km west of Ecuador and 330 km northeast of the Galápagos Islands,² the inhabitants of which appears to be of a significant value due to their biology and the ability to live and produce population in highly toxic and inhabitable circumstances. In addition to this, new communities have been discovered into the cold seep fields and all over the ocean that contain unique organisms with the distinctive characteristics and genes. Thus the numbers of States and companies are engaged into the bioprospecting within these areas as there is a high possibility that the organisms found within their communities can be bases of new discoveries into the drugs, cosmetics and in other fields of biotechnology.

Already well-explored terrestrial species that were primary sources of drugs and targets for bioprospecting tend to be substituted by bioprospecting on to the marine environment. Furthermore it should be mentioned that according to studies the proportion of potentially valuable organisms are higher in

¹ David Freestone, Salman MA Salman, 'Ocean and Freshwater Resources' in Daniel Bodansky, Jutta Brunnée, Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2007) 337, 341

² DM Karl, CO Wirsen and HW Jannasch, 'Deep-Sea Primary Production at the Galápagos Hydrothermal Vents' (1980) 207 *Science* 1345

marine organisms that in terrestrial species.³ In the search of the commercially valuable organisms large samples are connected within these areas that still remain insufficiently studied by the humanity and there is no precise answer to what extent these activities can be harmful for their ecosystems.

In the situation where there is still a poor knowledge about the role and importance of the ecosystems found within and beyond the areas of national jurisdiction there is no doubt that they “have critical function in the natural cycle and in supporting life on Earth.”⁴

The regime established under the United Nations Convention on the Law of the Sea⁵ seemed quite satisfactory when conservation and protection of the resources of the sea was concerned. UNCLOS that mostly codifies customary international law and imposes general principles on the States to protect and preserve the marine environment together with the codes of conduct adopted by FAO and through the co-operation among nations on a regional level represented quite acceptable set of rules until the new discovery.

Obviously, during the drafting of the UNCLOS (1973-82) nobody thought about the protection of the marine genetic resources, as it was very little known about them if any. But as the studies of these organisms continue and the results are very promising that their exploitation could become commercially beneficial it is urgent to have a comprehensive legal framework to protect these representatives of biodiversity. Despite the last 40-year attempts till now there are legal gaps and/or uncertainties about the rights of nations to access, conservation and protection of those resources within and beyond the areas of national jurisdiction. More importantly there is a threat that marine scientific researches that are frequently undertaken for the past decades can cause harmful consequences for the sustainable development of these organisms. Especially when deep-sea resources are concerned, as according to the scientific findings these resources are distinguished by being slow-growing and being late in maturity as well as having small number of distribution, for example the inhabitants of the

³ Doris König, “Genetic Resources of the Deep Sea – How Can They Be Preserved?” in Doris König, Peter-Tobias Stoll, Volker Röben, Nele Matz-Luck (eds), *International Law Today: New Challenges and the Need for Reform?* (Springer, New York, 2008) 141, 145

⁴ United Nations General Assembly, Oceans and Law of the Sea, Report of Secretary General, 66th Session, A/66/70, p. 4, available at <http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm> accessed 10 July 2012

⁵ Law on the Sea Convention (adopted 10 December 1982, entered into force 19 November 1994) UNTS (UNCLOS)

seamount sites.⁶ Finally, in the circumstances where the private sector is so much involved into the bioprospecting of marine genetic resources there is an increasing need for their protection.⁷

Today different international bodies are involved into the regulations of the issues relating to the marine genetic resources under their mandates: Food and Agriculture Organization of the United Nations (FAO), concerned with the fishing activities, including deep-sea fishing; World Trade Organisation (WTO); World Intellectual Property Organization (WIPO); United Nations Environmental Programme (UNEP) together with the COP, governing body of the Convention on Biological Diversity⁸, being concerned with the usage of the genetic resources not once has analysed in its meetings the importance of access to the marine genetic resources and fair and equitable sharing of benefits arising out of their utilization; United Nations Educational, Scientific and Cultural Organisation (UNESCO); International Seabed Authority (ISA), arguing about its mandate over the living resources; and other international or national organizations that carried out valuable studies and research on these issues.

In addition to the work carried out by the above-mentioned institutions the United Nations General Assembly acts as a coordinator among these bodies. It established *Ad Hoc* Open-Ended Informal Working Group by virtue of the Resolution 59/24 in 2004, to study issues relating to the conservation and sustainable use of marine biological diversity beyond the areas of national jurisdiction,⁹ besides already existing Open-Ended Informal Consultative Process on Oceans and Law of the Sea¹⁰ that also frequently discusses issues related to marine genetic resources at its meetings.

⁶ Erik Jaap Molenaar, 'Managing Biodiversity in Areas Beyond National Jurisdiction', in Myron H Nordquist and others, *Law, Science & Ocean Management* (Martinus Nijhoff Publishers Leiden/Boston 2007) 625, 648

⁷ As Dr. Leary indicates in his paper by the year 2004 (date of the publication of the paper) already at least seven biotechnological companies were interested in the development of the new commercially valuable products from the marine genetic resources. For instance, Verenium <<http://www.verenium.com/>> (formerly Diversa Corporation), New England Biolabs Inc, Invitrogen Corporation etc. Also research institutions such as: Japan Agency for Marine Earth Science and Technology, Australia's Commonwealth Scientific Industrial and Research Organisation etc. See DK Leary, 'Bioprospecting and the Genetic Resources of Hydrothermal Vents on the High Seas: What is the Existing Legal Position, Where are we Headed and What are our Options?' (2004) Vol. 1 *Macquarie Journal of International and Comparative Environmental Law*" 137, 143, 148

⁸ Conference of the Parties

⁹ *Ad Hoc* Open-Ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (established by paragraph 73 of GA Resolution 59/24, 17 November 2004), (Working Group)

¹⁰ United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea (established by GA Resolution 54/33, 24 November 1999), (UNICPOLOS)

1.2 Purpose

The purpose of the thesis is to give the answer, from the author's point of view, to the long-standing questions in front of the international community concerning marine genetic resources. In particular, are the marine genetic resources protected under the existing international legal framework and, if so, what is the applicable law? The aim of the paper is also to demonstrate if all the activities, closely linked to the conservation and protection of marine genetic resources, such as bioprospecting for instance, fall within the applicability of the "Constitution of the Oceans" and are sufficiently regulated. Furthermore, in case of failure of the UNCLOS, are there other international instruments or general principles of environmental law that can be found applicable, or further steps need to be taken?

In order to serve this purpose the author will provide different interpretation of UNCLOS to illustrate whether or not marine genetic resources fall under the regime established by the Convention for the resources within and beyond the national jurisdiction. Thus, *inter alia* the principles established within the different maritime zones for the conservation of marine resources and for the marine-scientific research will be analysed together with other principles of international environmental law.

Finally, the object of the thesis is to demonstrate how the legal gaps and uncertainties concerning conservation and protection of marine genetic resources can be overcome and how it should be regulated to ensure their sustainable development while taking into account the interest of poor, developing States and guarantee equitable sharing of the benefits resulted from their utilization.

1.3 Method and Materials

Due to the subject of the thesis some of the chapters of the paper will be descriptive in its nature in order to understand the essence of marine genetic resources, their uniqueness and importance for the society. Thus, scientific materials, reports and findings will be reviewed to some extent. The major part of the thesis will be based on the analyses of the Conventions and general principles of international environmental law, such as Principle 21 of Stockholm Declaration,¹¹ Principle 2 of Rio Declaration,¹² UN World Charter for Nature¹³ etc.

¹¹ Stockholm Declaration of the United Nations Conference on the Human Environment (adopted 16 June 1972) UNTS

Accepted practices of the States concerning conservation and protection of marine genetic resources within their national jurisdictions will also be examined. Analysis will be made on UNCLOS and the framework of the Convention on Biological Diversity¹⁴ as well as on the Bonn Guidelines.¹⁵

Beside the international and national legislation the paper will analyse the on-going discussions taking place at the United Nations, more precisely at the General Assembly, UNICPOLOS and Working Group, as well as at ISA, FAO, UNEP, COP Decisions and the studies carried out by United Nations University – Institute of Advanced Studies (UNU-IAS) and the International Union for Conservation of Nature (IUCN). However, paper will not address the discussions undergoing in the UNESCO, WTO and WIPO.

1.4 Delimitation

The chapter two will follow introduction to the thesis. The author will provide more information about the hydrothermal vents and their inhabitants. A brief overview will be provided of the other ecosystems that are regularly studied for searching valuable genes. Second chapter will mostly focus on the scientific knowledge available about the marine genetic resources and their potential impact on science and different industries.

In the third part the author will examine the fundamental principles of international environmental law. The discussions will include the general rules with regard to access to genetic resources and the benefit sharing arising out of their utilization within the national jurisdiction, as one of the fundamental principles of the CBD concerning marine genetic resources. The analyses will be supplemented by the existing practice and domestic legislation of the different States that are mostly interested and involved in the discussions concerning marine genetic resources, such as the USA, Canada, Philippines etc.

¹² Rio Declaration of the United Nations Conference on Environment and Development (adopted 14 June 1992) UNTS

¹³ World Charter for Nature, (adopted 28 October 1982) United Nations General Assembly, 48th plenary meeting, A/RES/37/7 available at <<http://www.un.org/documents/ga/res/37/a37r007.htm>>

¹⁴ Convention on Biological Diversity (adopted 22 May 1992, entered into force 29 December 1993)

¹⁵ Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits arising out of their Utilization (adopted April 2002), Access and benefit-sharing as related to genetic resources, COP 6 Decision VI/24 <<http://www.cbd.int/decision/cop/?id=7198>> accessed 1 March 2012

Furthermore, the chapter will be dealing with the issue of applicability of UNCLOS to the marine genetic resources found within the limits of national jurisdiction. As the Convention will be found to cover them, the discussions will further be concerned with the applicable provisions within different areas of territorial waters of the coastal State. Thus, the chapter will analyse each zone of the sea separately, where the coastal State exercises its jurisdiction and/or has sovereign rights.

For the purpose to find out the applicable laws, first thing that should be understood is the “bioprospecting” as such. Chapter three will try to differentiate whether bioprospecting on marine genetic resources is to be regarded as MSR as “defined” by UNCLOS or the provisions about the conservation of the resources of the sea should be applied. Finally with regards to applicability of UNCLOS the discussions will follow about the Part XII of the Convention as the general chapter specifically addressing the issue of protection of marine environment.

Chapter three will also analyse other principles of international environmental law that should be observed while carrying out bioprospecting on marine genetic resources. The State practice will also be brought under the attention and it will be observed how States have reacted to the policy concerning conservation of marine genetic resources and what are the means they have applied in order to protect and preserve them for future generations. The practice of involvement in regional agreements, ways of implementation of relevant international Conventions and the mostly accepted practice of establishment of MPAs for the protection purposes will be addressed and the flaws and benefits of such policies will be examined.

Next part will focus on the same issue addressed in the previous chapter but with regard to the areas beyond the national jurisdiction. The governing regimes established under UNCLOS for the ABNJ will be examined in order to discuss their applicability to the marine genetic resources. The focus will be on the regime of the Area, thus on the principle of Common Heritage of mankind and the regime of the High Seas. Discussions will also cover the mandate of ISA over the marine genetic resources and the functions of the Authority in the Area. In addition to this, other principles of international environmental law will be addressed together with the relevant non-binding legal instruments with the scope of applicability to the areas beyond the limits of national jurisdiction.

In the final part the author will address the possible ways to solve the ambiguity among the subject. Discussions will take place to what extent the

conservation and protection of marine genetic resources are already covered by international legal framework. The paper will underline the parts that still need to be regulated and analyse most of the suggested ways to fill in the gaps.

Chapter six leads the thesis to the conclusion where the author will summarise the study and suggests the best possible way from her point of view to eliminate the loopholes in the international law with regards to conservation and protection of marine genetic resources.

2 New Biological Resources

Exploitation of the resources of the ocean floor and the water column above has a long time history, however it is important to distinguish the general fishing activities and activities carried out for the future studies of the unique ecosystems within these areas. Nevertheless any of the activities such as marine scientific research, seabed mining, IUU fishing can be as threatening as the pollution of the sea by oil or by other hazardous substances, placement of underwater cables and pipelines etc. especially when we are talking about the areas of the deep-sea about which the humanity has a very little knowledge and requires to be particularly cautious in order not to lead to the drastic consequences.

The world under the sea is very interesting to observe. Its geology, living and non-living organisms form a huge circulation of development. The biological diversity of the ocean is divided vertically between epipelagic, mesopelagic and bathypelagic zones.¹⁶ The epipelagic zone extends till 200m in depth and most of the aquatic organisms are found here as the sunlight that is essential for photosynthesis can be easily reached. The mesopelagic zone is 1000 m deep and the habitation of the organisms becomes more rare, whereas below the mesopelagic zone, in bathypelagic region.¹⁷ It was for a long time believed that no life was sustained in the bathypelagic region because of the eternal darkness. Whereas new discoveries showed that this region in fact supports different communities and the unusual environment. The characteristics of the organisms found in here drive massive interest.

Different countries and organizations are involved in the research activities as stated in the recent report of the Secretary General,¹⁸ like China for instance that carried out research in 2010 on the abundance and species configuration of small benthic organisms among others. As well as the Census of Marine Life, that involves 2700 scientists from more than 80 States and has recently discovered new species and habitats of the deep-sea and the coral reef sites.¹⁹

¹⁶ Richard L. Huedrich, 'Distribution and Population Ecology' in David J Randall and Anthony P Farrell (eds), *Deep-Sea Fishes* (Academic Press 1997), 79, 82

¹⁷ *ibid*

¹⁸ United Nations General Assembly, Oceans and Law of the Sea, Report of Secretary General, 66th Session, A/66/70, pp. 9-10, available at <http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm> accessed 10 July 2012

¹⁹ Census of Marine Life, *Life in the World's Ocean: Diversity, Distribution and Abundance* (2010), in *ibid*

2.1 Phenomenon of Hydrothermal Vents and Their Inhabitants

2.1.1 Understanding of Hydrothermal Vents

One of the theories of how the life began on earth is associated with ocean and today there is an assumption that all could have started from the inhabitants of hydrothermal vents in early Archaean period about 4 000 million years ago.²⁰ The theories can vary until there are questions left without answers; nevertheless what has already been proved is that hydrothermal vent community is found to be of a vital importance for the society.

There is no precise answer on what is the number of the hydrothermal vents located within or beyond the areas of national jurisdiction as they are constantly destroyed time by time and new ones formed again.²¹ The seabed is very much like the continents with the mountains and large plains. Interestingly the Earth's largest mountain (56 000 kilometres long), mid-ocean ridge system is located on the ocean floor and this is where most of the hydrothermal vents are found.²² Some of the hydrothermal vents have been discovered in the eastern Pacific (East Pacific Rise and the Juan de Fuca, Gorda and Explorer Ridges) also in north central Atlantic (Mid-Atlantic Ridge).²³ Hydrothermal vents have also been discovered on the Loihi Seamount (Hawaii chain), Gakkel Ridge (which is located in the Arctic Ocean and runs from Greenland to Siberia)²⁴ etc. Some of them are even found on land among which can be named the famous geysers in Yellowstone National Park in the USA and on the North Island of New Zealand.²⁵

From the very beginning it is important to understand what are the hydrothermal vents as such and why are they often called as "black smokers"?

²⁰ Tullio Scovazzi, 'Conservation and Sustainable Use of Marine Biodiversity, Including Genetic Resources, in Areas beyond National Jurisdiction: A Legal Perspective' (2011) 7

²¹ See Supplement A.

²² The Deep Sea <<http://www.ceoe.udel.edu/deepsea/level-2/geology/deepsea.html>> accessed 15 February 2012

²³ CL Van Dover, *The Ecology of Deep-Sea Hydrothermal Vents* (2000) 68 in Leary 'Bioprospecting and the Genetic Resources' (n 7) 139

²⁴ Reuters, 'Life, but not as we know it, on the boiling bed of a frozen ocean', *Sydney Morning Herald* (Sydney), 30th November 2001 in Leary, 'Bioprospecting and the Genetic Resources' (n 7) 139

²⁵ Vents Around the World <<http://www.divediscover.whoi.edu/vents/vent-world.html>> accessed 15 September 2012

According to *plate tectonics*²⁶ theory the surface of the earth is made up with plates that constantly shift with a speed of 1-15 centimetres per year to the different directions.²⁷ They are the reasons of the earthquakes and to other changes on the earth. The moving of the plates causes the crack of the crust of the land. The same is happening with the ocean floor. When the water goes down into the clefts it becomes superheated by the hot magma in the depth of the earth, erupts back and forms the hydrothermal vents.²⁸ Thus, not surprisingly, the most active Mid-Ocean Ridge hosts the most of the hydrothermal vents along its territory.

When the hot water erupts into the ocean many liquefied metals come with it and by meeting with the cold ocean water (2-3°C), these metals become solid and form the shapes very much like chimneys. Depending on the minerals, the hydrothermal vents carry; their colour varies from black to white. When the vent contains iron and sulphide, the combinations of iron monosulfide gives them a black colour and often are called as “black smokers” and represent the hottest vents of the ocean (nearly 400°C or more).²⁹ So called “white smokers” contain particles of barium, calcium and sicilium and obviously these minerals give vents the white colour.³⁰

Among other matters that interest the scientist into these hydrothermal vents it is assumed that they play a significant role in the temperature and chemistry of the ocean.³¹ The unique flora and fauna within their sites that might lead to a new discoveries into the science field and benefit the humanity occupy these interesting features of the ocean floor.

2.1.2 Hydrothermal Vent’s Ecosystem and Their Importance

The development into the technology revealed existence of new organisms into the deep-sea, which based on researches and scientific steadies represent the unique communities. They are able to live and produce population in a toxic environment and in a complete darkness.

²⁶ *Plate* is referred to a large rock and *tectonics* in Greek means “to build”. Plate Tectonics <<http://www.ceoe.udel.edu/deepsea/level-2/geology/plate.html>> accessed 15 February 2012

²⁷ *ibid*

²⁸ *ibid*

²⁹ Hydrothermal Vents <<http://www.ceoe.udel.edu/deepsea/level-2/geology/vents.html>> accessed 15 February 2012; Johannes F Imhoff and Michael Hüglér, ‘Life at Deep Sea Hydrothermal Vents— Oases Under Water’ (2009) 24 *The International Journal of Marine and Coastal Law* 201, 202

³⁰ Hydrothermal Vents (n 22)

³¹ *ibid*

Before the first hydrothermal vent was discovered it was believed that the deep-sea community was obtaining food only from the euphotic primary production whereas the discovery of 1977 revealed that there was an alternative source of food for the organisms living as deep as 2100 meters.³² Water surrounding hydrothermal vents that is rich with the various minerals was found to be an attractive place for different organisms. Generally, most of the minerals found in the hydrothermal vent sites are toxic to the organisms but the ones found into these areas are adapted to the circumstances and in fact those toxic minerals represent the sources for their food and energy.

Into the depth where the hydrothermal vents are found sunlight cannot be reached so instead of the sun, organisms use chemicals to produce the energy, the process is known as chemosynthesis.³³ To be more precise, the free-living microbes and symbiotic bacteria are those organisms that can produce the food by chemosynthesis, whereas other organisms use the bacteria to support their lives.³⁴ The life of the tubeworms, clams, mussels and other animals found in the hydrothermal vent fields depend on these bacteria. Those animals by consuming or harbouring those bacteria are able to grow and sustain their selves by the food these tiny organisms make.³⁵

Due to the ability of the organisms found in hydrothermal vent sites, to live in such a toxic environment, under a temperature that exceeds 400°C and because of their unique genes and character to convert harmful and toxic chemicals into the food and energy and due to the other qualities the interest of scientists and the different industries into these organisms is very significant. The example can be the best studied hydrothermal vents site – the Endeavour, that interests various scientists like geophysicists who try to understand its structure and connection to the other parts of the Juan de Fuca Ridge, geologists that are interested in the unique geological features hydrothermal vents make, physicists that intent to do more research on its thermal flumes and its effect of the ocean water, chemists that are interested in consistence of the vent fluids, biologists that seek to know more about the site's flora and fauna and finally microbiologists that are interested in

³² Karl (n 2)

³³ Chemosynthesis, <<http://www.ceoe.udel.edu/deepsea/level-2/chemistry/chemo.html> > accessed 16 February 2012; Scovazzi, 'Conservation and Sustainable Use of Marine Biodiversity' (n 20) 7; For more information see Imhoff (n 29), 203

³⁴ Imhoff (n 29) 203-04

³⁵ The examples of the organisms that do not have mouth and have to harbor the symbiotic sulphur bacteria into their bodies are tubeworms (*Riftia pachyptila*) and mussels (*Calyptogena magnifica* and *Bathymodiolus thermophiles*). *ibid*
It is also interesting to note that some of the organisms such as tubeworms have mouth from the beginning and they are able to consume bacteria but after a while due to their adaptation to the environment this features disappears. Chemosynthesis (n 33)

bacteria and other life forms found in this field.³⁶ In addition to this, representatives of private sector are interested in mining activities in the Juan de Fuca Ridge and Galapagos Rift for the discovered polymetallic sulphide deposits.³⁷ They can be bases of a new development in new drugs, such as drugs against cancer, fungal disease, malaria, inflammation etc.³⁸ Furthermore, as Head of Microbiology and Bioprocessing Department of Spain, Fernando de la Calle remarks, their prospective usage for “drug discovery is just one of many possible options.”³⁹ Among other matters marine genetic resources have cultural, spiritual and aesthetic values.⁴⁰

2.2 Other Unique Features of the Ocean and Their Importance

Bioprospecting for marine genetic resources is being conducted into other various ecosystems of the deep-sea such as seamounts, cold water coral reefs, cold seeps, sponge reefs, abyssal plains etc.⁴¹ There are communities that are unique into their characteristics and include the animals that might not be found elsewhere. Some of them will be examined below.

As it was already mentioned ocean floor very much resembles the characters of the continents with its mountains, volcanoes and large fields. The seamounts are called the underwater mountains on the ocean floor. They do not come above the surface of the water and are of a volcanic origin. Many islands have been created from the seamounts worldwide. Being the best

³⁶ V. Tunnicliffe and R. Thomson, *Oceans Background Report. The Endeavour Hot Vents Area: A Pilot Marine Protected Area In Canada's Pacific Ocean* (1999), 2. cited in David Kenneth Leary, *International Law and the Genetic Resources of the Deep Sea*, vol 56 (Vaughan Lowe ed, Publications on Ocean Development, Martinus Nijhoff Publishers 2007) 106

³⁷ *ibid*

³⁸ United Nations General Assembly, Oceans and the Law of the Sea, Report from the Secretary General, 62nd Session, A/62/66. Para 164

For instance according to Tim Shank, a biologist at Woods Hole Oceanographic Institution (WHOI) in the USA, a specific type of worm that lives under the hazardous and cancer threatening conditions does not grow the cancer and more studies on it may lead to the discovery of anti-cancer drugs. Laura Ruth, ‘Gambling in the Deep Sea’ (2006) 7 (1) *EMBO reports* 17

³⁹ Fernando de la Calle, ‘Marine Genetic Resources. A Source of New Drugs The Experience of the Biotechnology Sector’ (2009) 24 *The International Journal of Marine and Coastal Law* 209, 210

⁴⁰ Susan Perkoff Bass and Manuel Ruiz Muller (eds), *Protecting Biodiversity, National Law and Regulating the Access to Genetic Resources in the Americas* (International Development Research Centre 2000) 2

⁴¹ Thomas Greiber, ‘Access and Benefit Sharing in Relation to Marine Genetic Resources from Areas Beyond National Jurisdiction, A Possible Way Forward’ Study in Preparation of the Informal Workshop on Conservation of Biodiversity Beyond National Jurisdiction, (Bonn, December 2011) IUCN <http://www.bfn.de/0502_skripten.html> ‘Accessed 15 February 2012’, 6

hosts of the active volcanoes seamounts are often associated with “hotspots” of the ocean floor.⁴² According to researches, seamounts represent the centre for introduction of new species to the ocean and are the attractive areas for the various types of fish for food.⁴³ In fact, it has been proved that they distribute food for the pelagic fauna, as are sources of the primary productions.⁴⁴ In the need of better understanding of the seamounts and their ecosystem, different researches are carried out. One of the major ones, so called “The Seamounts Project” that has began in 2009 by the cooperation of IUCN and GEF is conducted on five seamount in the areas beyond national jurisdiction in the southern Indian Ocean and already has discovered around 200 new species of fish and 74 species of squid.⁴⁵ It is interesting to note that hydrothermal vents has also being detected by the seamount fields and despite the difference into the biology of the seamount hydrothermal vents and hydrothermal vents of the Mid-Ocean Ridge system some of the species have found to be “typical.”⁴⁶

Cold-water coral reefs⁴⁷ are also under the attention of the scientists and different industries. Often corals are viewed as rocks or considered as plants as they share some characteristics and were considered as such before the finding made by the French biologists J. A. de Peysonell in 1753 that in fact they were found to be animals and representatives of the relatives of jellyfish.⁴⁸ The news about the existence of communities of cold-water corals is not as recent as to other ecosystems however the latest findings showed that they are prevalent into all over the ocean.⁴⁹ Even though first deep-water coral has been discovered in late 18th century there is not much known about them. The best-known reef-creating coral is formed by

⁴² The Southampton Oceanography Centre & A. Charlotte de Fontaubert, ‘The Status of Natural Resources of High-Seas’ (2001) WWF/IUCN, 22

⁴³ Kristina M. Gjerde, ‘Ecosystems and Biodiversity in Deep Waters and High Seas’ (2006) UNEP Regional Seas Report and Studies N178, 14

⁴⁴ The Southampton Oceanography Centre (n 42) 23

⁴⁵ United Nations General Assembly, Oceans and Law of the Sea, Report of Secretary General, 66th Session, A/66/70, p. 11, available at <http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm> accessed 10 July 2012

⁴⁶ Rogers, A D (1994). The biology of seamounts, *Advances in Marine Biology* 30: 305-350 cited in *ibid* 24

⁴⁷ Coral is referred as “polyphyletic assemblage of organism.” J Murray Roberts, Andrew J Wheeler, Andre Freiwald and Stephen D Cairns, *Cold-Water Corals, The Biology and Geology of Deep-Sea Coral Habitats* (Cambridge University Press 2009) Reef is defined as “a significant, rigid skeletal framework that influences the deposition of sediments in its vicinity and that is topographically higher than the surrounding sediment” Alex Rogers, ‘The Biology, Ecology and Vulnerability of Deep-Water Coral Reefs’ British Antarctic Survey, (Cambridge, 2004) IUCN

⁴⁸ NOAA Coral Reef Conservation Programme, Coral: Plant Animal or Mineral? <<http://coralreef.noaa.gov/aboutcorals/coral101/plantanimalmineral/>> accessed 8 March 2012

⁴⁹ Gjerde (n 43) 15

Lophelia pertusa.⁵⁰ There are in fact two types of corals that include hundreds of varieties of coral species. Ones that are found in the shallow waters are so called soft corals and hardly ever found deeper than 100m and others are deep ocean corals or so called cold-water corals as they are found as deep as 3000m inhabiting continental shelves, slopes, canyons and seamounts.⁵¹ Both types of corals inhabit wide variety of biodiversity. The cold-water corals are interesting due to the possibility of discovery of new drugs as well as the anti-fouling substances among their other possible usages.⁵²

Another interesting types of communities are found in cold seeps. They are often referred as “brine pools”, in other words “lakes at the bottom of the ocean with an extremely high degree of salinity, mud volcanoes, and methane hydrates.”⁵³ These features of the seabed are quite widespread all over the ocean including continental shelves, slope, rise and the deep ocean floors, sometimes found as deep as 3000m or more in a total darkness. There are quite a few similarities with the cold seep areas and the hydrothermal vent fields. However the difference is that the temperature in the former is not as high as in case of hydrothermal vents and is almost equal to the temperature of the surrounding waters.⁵⁴ Cold seeps are distinguished regions as there is periodical escape from the cracks of the ocean floor of the hydrogen sulphide, methane, other hydrocarbon fluids, gases and other minerals from their sediments.⁵⁵ Similarly, to the hydrothermal vent communities, cold seep communities also depend on the symbiotic bacteria that again similarly to the bacteria found in hydrothermal vents produce the food by chemosynthesis instead of photosynthesis.

The interest of the cold seep communities is wide, especially to the biotechnology industry as the bacteria found within their sites contain unique gens that can be useful for the cleaning up of the oil pollution.⁵⁶

It is evident that the ocean floor and the water column above are full of abundant organisms some of which has been discovered recently but the

⁵⁰ It is a colonial coral that is found in to the depth of 2000 m where the sunlight cannot be reached. The Southampton Oceanography Centre (n 42) 33-34

⁵¹ NOAA Coral Reef Conservation Programme, Where are Corals Found? <<http://coralreef.noaa.gov/aboutcorals/coral101/corallocations/>> accessed 8 March 2012

⁵² *ibid*

⁵³ König, (n 3) 144

⁵⁴ UNEP ‘Deep-Sea Biodiversity and Ecosystems: A Scoping Report on their Socio-Economy, Management and Governance’ (2007) 19

⁵⁵ *ibid*; Lisa A Levin, ‘Ecology of Cold Seep Sediments: Interaction of Fauna with Flow, Chemistry and Microbes’ (2005) 43 *Oceanography and Marine Biology: An Annual Review* 2-8

⁵⁶ The Southampton Oceanography Centre (n 42) 47

major part is still unknown. The studies and bioprospecting is frequently undertaken into these ecosystems for searching valuable answers and the protection of these areas becomes more and more important.

2.3 Definition of Marine Genetic Resources

Talking about the biological discoveries it is important to define marine genetic resources. There is no general definition of the term as such. Except there is definition of the genetic resources provided for the purposes of the CBD. According to the Article 2 of the Convention, genetic resources are one of the dimensions of the biological resources and “include any material of plant, animal, microbial or other origin containing functional units of heredity” and “are of actual or potential value.” To make thing clear, it is well known that each living organism contain functional units of heredity⁵⁷ or so called genes. Although this definition is exclusively for the CBD, it can be argued that it represents a general definition of the “genetic resources”.

A little bit more broad definition was provided by the Secretary General in its Report stating that “genetic resources can include plant seeds, animal gametes, cutting or individual organisms, as well as DNA extracted from a plant, animal or microbe, such as chromosome or a gene, with actual or potential value for humanity in light of their genetic characteristics.”⁵⁸

As Dr David Galbraith explains, four entities that can be considered as “functional units of heredity” are: intact cells, whole chromosomes, genes and DNA fragments smaller than genes. He further continues that whether or not units of heredity can be functional very much depends on the available technology. Thus, as Dr Galbraith states: “[A]ny carrier of heredity information that can be passed from one organism to another could arguably be described as a ‘functional unit of heredity’”.⁵⁹ Recently, the delegations at the meeting of the Working Group emphasised the need to define the

⁵⁷ Thomas H Heidar, “Remarks of the Moderator” in Myron H Nodquist and others, *Law, Science & Ocean Management* (Martinus Nijhoff Publishers, Leiden/Boston, 2007) 619-20. The definition explicitly excludes human genetic resources. Stephen Tully, ‘The Bonn Guidelines on Access to Genetic Resources and Benefit Sharing’ (2003) 12 (1) *RECIEL* 84, 88.

⁵⁸ United Nations General Assembly, Oceans and Law of the Sea, Report of Secretary General, 60th Session Addendum, A/60/63/Add.1, p.3 <http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm> accessed 10 July 2012.

⁵⁹ Dr David Galbraith, Royal Botanic Gardens, Hamilton, Canada and personal communication with Dr Mark Chase, Royal Botanic Gardens, Kew cited in Kerry ten Kate & Sarah A Laird, *The Commercial Use of Biodiversity, Access to genetic resources and benefit-sharing*, (Earthscan 1999), 18.

scope of the MGR, in other words were they encompassed the MGR of the deep seabed and subsoil or also included living resources in the water column.⁶⁰

Simply speaking, marine genetic resources can be defined as the organisms or their parts found in the marine environment that contain functional units of heredity and have actual or potential value for humanity.

⁶⁰ United Nations General Assembly, Report of the Working Group 67st Session, Doc. A/67/95 of 13 June 2012 at p. 5, Para 18, at <http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm> accessed 14 October 2012

3 Conservation of the Deep-Sea Genetic Resources within the Areas of National Jurisdiction

At first glance it could be seen that the conservation of the resources are the best way regulated within the borders of the States. Besides the universal or regional treaties such as UNCLOS, Fish Stock Agreement,⁶¹ 1990 Kingston Protocol,⁶² Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)⁶³, Convention on Migratory Species of Wild Animals⁶⁴ etc. that imposes obligations on the State Parties to manage the conservation and protection of their resources, the States within their domestic legislation impose the allowable catching quotas, regulate the fishing equipment, require special licences and so on in order to protect the marine biodiversity and preserve them for future generations. However, this is not always the case especially if we are talking about the developing States. Some of them are not even becoming parties to the International Conventions, while others are often finding difficulties in the implementation of the international instruments and thus in obeying their international obligations.

As recently has been discovered, some of the resources of the sea can be commercially highly valuable due to their genes. While these genetic resources can be found in all over the ocean the major focus of biodiscovery is in the special regions with the distinguished nature and environment that have extreme condition, mostly with high level of heat and toxicity. The ecosystems mostly found near hydrothermal vent sites, coral reefs etc. are located not only beyond the areas of national jurisdiction but also within EEZ or CS of the States, thus falling under their jurisdictions.

It is important to understand how are the marine genetic resources protected within the borders of the States and what are the legal principles applicable when such resources are on the one hand under the jurisdiction of a sovereign State and on the other hand contain an information that would

⁶¹ Agreement for the Implementations of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (adopted 4 August 1995, entered into force 11 November 2001) UNTS

⁶² 1990 Kingston Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (adopted 18 January 1990, entered into force on 18 June 2000)

⁶³ Adopted in 1963, entered into force on 1st July 1975 IUCN

⁶⁴ Adopted 23 June, entered into force on 1 November 1983 UNEP

benefit the humanity and thus represent the global interest. As it will be observed later, different countries take different positions. Developed countries that are mostly user-states, prefer to establish practice of unrestricted access to the MGR, whereas developing nations struggle to have control over their genetic resources and receive compensation and share the benefits arisen out of the utilization of their genetic resources. It is important to look at the international and national laws governing conservation of marine genetic resources within the areas of national jurisdiction and at the State practice in the implementation of the international laws and collaboration of the domestic policies for the sustainable development of such resources. The analyses of the outcomes of such strategies, will provide the information about the existing problems concerning marine genetic resources under the national jurisdiction and at the same time serve as the possible guideline for the ocean governance beyond the limits of national jurisdiction.

The CBD, which specifically addresses the biological diversity will be analysed together with UNCLOS. Although UNCLOS does not directly address the marine genetic resources, it regulates the protection of the marine environment in general, including the conservation and utilization of the resources of the coastal States.

3.1 General Principles under the CBD

For a long time access to genetic resources was not controlled by any legal instrument as they did not acquire any value.⁶⁵ They were considered to be the heritage of mankind and no matter they were located within or beyond the national jurisdiction access to them was free to everyone.⁶⁶ This principle was recognized by the nonbinding international instrument - International Undertaking on Plant Genetic Resources⁶⁷, which in its Article 1 stated that “Undertaking is based on universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction.” Although the principle was concerned only with the plant genetic resources it could have been extended to the genetic resources in general. This idea is supported by the argument brought by the

⁶⁵ Richard J McLaughlin, ‘Foreign Access to Shared Marine Genetic Materials: Management Options for Quasi-Fugacious Resource’ (2003) 34 *Ocean Development & International Law* 297, 299

⁶⁶ Rosemary Rayfuse, ‘Biological Resources’ in Daniel Bodansky, Jutta Brunnée, Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2007) 362, 378 J Hardon, ‘National Sovereignty and Access to Genetic Resources’, (1996) 27 *Biotechnology and Development Monitor*, 24

⁶⁷ International Undertaking on Plant Genetic Resources for Food and Agriculture (adopted 1983)

Philippe Cullet in his paper. He states that the open access system that was established by the Undertaking, although was only concerned with plant genetic resources, *de facto* was applicable to the wild biodiversity as there were no other regulations in place.⁶⁸ However, it is important to note that while talking about the applicability of “heritage mankind” principle to the [plant] genetic resources this does not mean that “free access” was “free of charge”.⁶⁹

Only after recognizing that the information and the compounds found in such resources were used for discoveries of new drugs and were contributory for other highly valuable industrial uses, the nations having such resources within the borders of their countries realized that there was a need to regulate access to genetic resources in a way to get shares from the benefits that would arise out of their utilization.⁷⁰ The opinions were contradictory among the biodiversity-rich and biodiversity-poor countries. The later were interested in exploitation of the marine genetic resources, in the former States. Biodiversity-rich countries were arguing for the strict control over the access to the genetic resources, whereas the biodiversity-poor countries were claiming that in order to achieve the sustainable development more flexible rules should have been established than were claimed by providing States.⁷¹ Thus, increasing concern over the protection of the biological diversity together with the importance of the recognition of the sovereign rights of the source countries over their genetic resources lead to the adoption of the CBD at the United Nations Conference on Environment and Development at Rio de Janeiro (Rio Conference) in 1992.

As it is cited in the official web page of the Convention:

The Convention on Biological Diversity was inspired by the world community’s growing commitment to sustainable development. It represents a dramatic step forward in the

⁶⁸ Philippe Cullet, ‘Environmental Justice in the use, knowledge and exploitation of genetic resources’, in Jonas Ebbesson and Phoebos Okowa (eds), *Environmental Law and Justice in Context* (Cambridge University Press, 2009) 371, 373

⁶⁹ FAO Resolution 4/89, 25th Session of the FAO Conference (Rome, 1989) cited in Bass (n 40) 3

⁷⁰ Lyle Glowka, *A Guide to Designing Legal Frameworks to Determine Access to Genetic Resources*, Environmental Policy and Law Paper No. 34, IUCN-The World Conservation Union, (1998); Rayfuse (n 66) 378

⁷¹ Bass (n 40) 3

The distinction should be made between the States that possess genetic resources within their natural habitats so called States of origin from providing states that supply genetic resources from *in-situ* or *ex-situ* sources and from States that are the final consumers of these resources – user States. Tully (n 57) 88

conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources.⁷²

From the very beginning the main concern of the CBD was terrestrial organisms however today greater attention is paid to the marine biodiversity.⁷³ These are the objectives of the CBD, including appropriate access and rights over genetic resources and transfer of technology as well as the rights over them together with the funding.⁷⁴ Thus, the main principle of the CBD is to ensure appropriate access to genetic resources and equitable sharing of benefits. The former includes the ways of obtaining genetic resources and related knowledge whereas the later is the form of compensation to the owners of such resources.⁷⁵

The CBD apply to all the genetic resources *inter alia* marine genetic resources.⁷⁶ This is evident at first from the definition of terms provided in the Article 2 of the Convention that the biological diversity in the Convention includes the marine and other aquatic ecosystems. Furthermore, the governing body of the Convention dedicated several decisions exactly to the marine genetic resources and in its target 10 of the revised and updated Strategic Plan for Biodiversity 2011-2020 that was adopted at COP X⁷⁷ it specifically addresses the protection of the coral reefs among other vulnerable ecosystems. Thus, in order to protect the biological diversity, the CBD focuses on all sources of biological resources that includes “genetic resources, organisms or parts thereof, populations or any other biotic components of ecosystems with actual or potential use or value for humanity”⁷⁸ and is not limited to the wild flora and fauna.⁷⁹ This also represents one of the strategic goals of the Plan 2011-2020, improving biological diversity by safeguarding ecosystems, species and genetic diversity.⁸⁰ What should be taken into account is that, the CBD is limited into the scope of its jurisdiction. According to the Article 4 of the

⁷² History of the Convention Biological Diversity <<https://www.cbd.int/history/>> accessed 1 March 2012

⁷³ Louise Angelique de Law Fayette, ‘A New Regime for the Conservation and Sustainable Use of Marine Biological Diversity and Genetic Resources Beyond the Limits of National Jurisdiction’, (2009) 24, *The International Journal of Marine and Coastal Law*, 221, 222

⁷⁴ Article 1 of the CBD

⁷⁵ Cullet (n 68) 372

⁷⁶ Alan Boyle ‘Relationship Between International Environmental Law and other Branches of International Law’ in Daniel Bodansky, Jutta Brunnée, Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2007) 125, 139

⁷⁷ The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, UNEP/CBD/COP/DEC/X/2 (29 October 2010) <<http://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf>> accessed 1 March 2012

⁷⁸ Art. 2 of the CBD

⁷⁹ Rayfuse (n 66) 365-366

⁸⁰ Key Elements on the Strategic Plan 2011-2020, including Aichi Biodiversity Targets <<http://www.cbd.int/sp/elements/>> accessed 1 March 2012

Convention it applies to the areas that fall within the national jurisdiction of the States or is applicable to the areas beyond the national jurisdiction but only with regards to the activities that are carried out under the control of Contracting States. It is important to point out the principles established by the CBD and Bonn Guidelines and their level of protection of marine genetic resources within the areas of national jurisdiction. Due to the flexible nature of the Convention and the Guidelines, most of the principles can also be applied for the marine genetic resources located beyond the areas of national jurisdiction.

3.1.1 Access to Genetic Resources

In order to fulfil the main objectives of the Convention that is provided in the Article 2, it is essential to ensure appropriate access to genetic resources. This principle is further extended into the Article 15 of the Convention and regulated in detail in the Bonn Guidelines.

First of all it is important to understand what is meant under the “access to the genetic resources”. As Philippe Cullet explains it, this is “the condition under which individual and collective holders of such resources and [associated] knowledge can control their transfer outside of their local environment.”⁸¹ Whereas holders of the terrestrial genetic resources can be private persons as well as the Governments, when it comes to the deep-sea genetic resources within the areas of national jurisdiction, only States can have the sovereign rights over such resources. Philippe Cullet continues, “[f]rom an international perspective, access refers to the condition that states can put on the use of genetic resources and related knowledge found under their jurisdiction.”⁸²

During the fifth negotiation of the International Negotiating Committee for a Convention on Biological Diversity the representative of FAO informed the committee that at the on going FAO Conference in Rome the annex 3 of the International Undertaking on Plant Genetic Resources has been approved, which recognised State’s sovereign rights over their plant genetic resources.⁸³ The same approach has been taken by the CBD and recognised sovereign rights of States over their genetic resources by virtue of Article 15. So they are no longer falling under the regime of the “heritage of mankind” but the nations found those resources within their borders have

⁸¹ Cullet (n 68) 373

⁸² *ibid*

⁸³ Report of the Intergovernmental Negotiating Committee for a Convention on Biological Diversity on the Work of its Third Session/Fifth Negotiating Session, Geneva 25 November – 4 December 1991, United Nations Environment Programme, Para 27

the sovereign rights and thus the ownership over the resources, however the issue and the means of the regulation of the access to them was left to exclusive prerogative of the national legislation. In other words, State Parties take the responsibility to implement the Convention in a way to determine the forms of local or foreign access to the marine genetic resources within their domestic legislation. What the Convention requires the Contracting Parties to take into account is that, on the one hand the access to the marine genetic resources should be regulated in a way not to cause the harm to the [marine] environment and on the other hand there should be no such restrictions that would be contrary to the objectives of the Convention. In fact the CBD intends to facilitate the access to marine genetic resources.

3.1.1.1 Prior Informed Consent

According to the paragraph 5 of the Article 15 of the CBD if the Contracting Party do not establish the contrary under its domestic legislation the access to the marine genetic resources is subject to the PIC of the sources country. Thus, unless there is explicit consent of the country owning such resources to allow the access to marine genetic resources, nobody would have such right. To what constitutes the consent and the procedure for its obtaining is subject to the domestic legislation. The national legislation of the Philippines, that is party to the CBD, could serve as an example. Under the section 6.1.3 of the Administrative Order N96-20 of the department of Environment and Natural Resources (1 June, 1996) it is stated that the Prior Informed Consent Certificate (issued in accordance of the Section 7 of the Order) for the bioprospecting should be obtained from the Indigenous Cultural Communities/Indigenous People in cases when it should be undertaken within their ancestral lands, from the Local Communities if such activities will be carried out within the areas under their jurisdiction, from the Protected Area Management Board when bioprospecting should be undertaken within protected areas that are under its responsibility or from Private Land Owners – for the activities within private lands.

Thus, beside the emphasises made to what might constitute the consent from the example of Philippines it can be seen that sometimes the entities or private owners exercising the jurisdiction or having proprietary interests in the resources control the access to genetic resources. The same example can be the legislation of Argentina that prescribes private ownership over the genetic resources if they are not owed by states, the provinces, the

municipalities or have been appropriated by occupation.⁸⁴ However, when it comes to the resources found within maritime zones, according to the Article 124 of the Constitution of Argentina the living resources of the maritime zones except in EEZ are subject to the ownership of the provincial Governments whereas the Article 968 of the Law 23 states that Argentina has the sovereign rights over the resources within EEZ.⁸⁵ Consequently the access to these resources requires the permission from the relevant authorities.⁸⁶ Both countries are parties to the CBD and act well within the framework of the Convention. The similar practice is adopted by the USA that has signed the CBD but is not yet party to it. The Government of the USA does not interfere much with the access to genetic resources on private lands, but implements the CBD in a way to prioritize the private ownership over the resources, except if the access is concerned with the endangered species. Only in later cases and for the activities within territory controlled by the governmental entities the permit is required.⁸⁷ As for the marine resources that would include genetic resources as well, they fall within the sovereignty of the federal government.⁸⁸ As it is quite evident the State practice over the access to resources *inter alia* genetic resources very much differs on land and on water. While some of the States prescribe private ownership and give the authority to the private owners and other entities to regulate access to [genetic] resources on land, the resources in the water column is left to the Governmental entities to regulate.

However, it is important to take into consideration that not all the countries recognise private property rights over the natural resources, such as Georgia for instance. The Law of Georgia on State Property Privatisation, Privatisation or Transfer the Right of Use of the Property of Local Self-Governmental Entities⁸⁹ in its Article 4 states that the natural resources, Territorial Sea, Contiguous Zone, Exclusive Economic Zone and Continental Shelf among other categories in the list can not be transferred in the private ownership and thus the control over them is left to the Governmental entities alone, including the right to issue a consent certificate for access to the biological resources within these areas as well as in general. The Article 5(2) of the Law of Georgia on Licences and Permits⁹⁰ states that the organs issuing such permits are the central Governmental entities and only in the special circumstances such right can be delegated to the respective institutions of the Autonomous Republics. According to the

⁸⁴ Bass (n 40) 38

⁸⁵ *ibid*

⁸⁶ *ibid* 53

⁸⁷ *ibid* 31, 97

⁸⁸ *ibid* 50

⁸⁹ 3.11.2009, N 1942, translated by the author

⁹⁰ 14.12.2007, N 5602, translated by the author

Article 35(4) of the same Law the right to access to marine biological resources in EEZ of Georgia should be issued in a form of licence by the Ministry of Energy and Natural Resources of Georgia. As for the marine genetic resources, the State has no legislation exclusively focusing on the issue, except that it is party to the CBD and as the monistic country international treaties automatically become part of the internal legislation upon their ratification or accession. It is important to note that not all the provisions of the CBD are self-executing and thus require special actions from the contracting States. Besides the fact that no legal document could have been found to date addressing marine genetic resources it can be well argued that they share the same status as the biological resources containing them.

This is how the practice of States differs when it comes to the ways of implementation the CBD. The Convention itself gives the possibility to the Contracting States to fluctuate as long as the main principles of the Convention are observed. However, the main difficulties often arise in the adoption of the relevant domestic legislation specifically addressing to the marine genetic resources.

3.1.1.2 Mutual Agreements

Generally, the source countries of the marine genetic resources enter into the mutual agreements with the private companies that are interested into bioprospecting of the marine genetic resources, usually these agreements are so called material transfer agreements.⁹¹ However, the parties can draw any other forms of the contracts that would determine the terms and the conditions on access of marine genetic resources as well as the ways of benefit sharing.⁹² It is important to underline that the contract should be on mutually agreed terms but in consistence of the Article 15 of the CBD.

3.1.1.3 Level of Access

One of the main problems that need further attention is the level of access to the marine genetic resources under international law and State practice. It is very important to preserve marine living organisms and thus the marine environment but there should not be restrictions that would hamper the new discoveries and development. Whereas the establishment of the freedom to

⁹¹ Steven M. Rubin and Stanwood C. Fish, *Biodiversity Prospecting: Using Innovative Contractual Provisions to Foster Ethnobotanical Knowledge, Technology, and Conservation*, 5 COLO. J. INT'L ENVTL. L. & POL'Y 23 (1994) cited in McLaughlin, (n 65) 303

⁹² McLaughlin, (n 65) 303

access to marine genetic resources would be in violation of provisions of the CBD it is also important to note that in order to facilitate the access to the marine genetic resources, the Contracting States should not impose such restrictions that would be contrary to the objectives of the Convention. Nevertheless, UNCLOS as well as the CBD give the bases for the sovereign States for the restriction of the bioprospecting. The Contracting Party can restrict under its domestic legislation carrying out any type of activities, including bioprospecting, within some of their ecosystems that could be justified by the urgency to adopt the precautionary measures and by the strategies and policies established to preserve the resources. The status of bioprospecting under international law will be further examined but it is important to note that such restriction can also be based on the Article 15(5) of the CBD that requires prior informed consent in order to be able to carry out bioprospecting and on the Article 246(3) of UNCLOS. UNCLOS does not oblige State Parties to give the consent to the marine-scientific research within their EEZ that is to be carried out for the commercial purposes. State Party *shall* give the consent for the MSR merely in the EEZ or CS for the development in scientific knowledge of the marine environment. According to the Article 246(5)(a) coastal State may refuse to give consent for the MSR in its EEZ or CS if it considers that the research is directly concerned with exploitation of the marine resources.

Thus, in contrast to the practice before adoption of the CBD that anybody could have patented the discovery and send it to the interested companies, now according to the objectives of the CBD the sovereign States has the right to restrict the activities carried out for the commercial interest. An example can be the contract between *p. profundum* and the Philippine Government concerning discoveries in Sulu Sea.⁹³ To conclude, the CBD, while trying to foster the discoveries, mostly focuses on the preservation of the environment and encourages conservation of the genetic resources only by environmentally sound uses.

3.1.2 Benefit-Sharing

As mentioned above, before the adoption of the CBD [plant] genetic resources were considered as heritage of mankind, access to them was free to all and was based on “fixed prices” for the conservation. The CBD established a principle that would safeguard the interests of the providers and consumers on an equitable level and that would be the requirement of benefit sharing out of the utilization of the genetic resources. Benefit-sharing is a way through which the owners of the genetic resources can

⁹³ Any financial gain from the discoveries is prohibited. Ruth (n 38) 18

benefit from the final product evolved from the resources, although they do not have IPR over the ones.⁹⁴

As Schrecker justly argues the benefit sharing with the sources countries or any other forms of commercial gain is ultimately important in order to preserve the biodiversity. He brings an example of Nova Scotia, the Government of which decided to open Campbell for mining activities after Canada announced that they were going to include this area under national ecosystem protection programme.⁹⁵ It is evident that preserving territory and its ecosystem is associated with huge expenses from the Governments whereas on the opposite there is also a possibility to use those areas in a commercially beneficial way. It is very likely that Governments will choose the second option; especially the developing States are concerned. Thus, in order to ensure the access to the marine genetic resources and their sustainable development, it is important to make the sources countries, besides environmental purposes, also commercially interested in preserving the marine environment and its biodiversity.

Consequently one of the main objectives of the CBD is provided in the Article 2, that is the “fair and equitable sharing of benefits arising out of the utilization of genetic resources”, this has been one more time reaffirmed in the COP X/I.⁹⁶ The Convention further makes several indications of what should the source countries require to be shared. It can be monetary or non-monetary benefit-sharing and shall include: royalty payments, fees for licences for access, the right of fair and effective participation of the source countries in scientific research as guaranteed by the Article 15 (6) and 19 (1); Sharing and priority in access to the results and outcomes of the research and to any commercial or other types of benefits arising from their utilization; sharing and priority access to the biotechnologies based on these genetic resources in a fair and equitable manner.⁹⁷ These are the benefits, but are not limited to, that source countries ought to receive from the entities carrying out MSR on their marine genetic resources. However, it is often difficult to determine how the genetic resources will be used and thus what benefits they will provide. Getting final product requires years of sampling and testing and huge expenses. It is especially difficult to say what should be understood under the commercial benefit. Shall it include financial gain obtained from the final product or all expenses for the activities previously carried out in the search of valuable resources? And this is just a single

⁹⁴ Cullet (n 68) 375

⁹⁵ Bass (n 40) 14-15

⁹⁶ Access to genetic resources and the fair and equitable sharing of benefits arising from their utilization, UNEP/CBD/COP/DEC/X/1 (29 October 2010) <<http://www.cbd.int/doc/decisions/cop-10/cop-10-dec-01-en.pdf>> accessed 1 March 2012

⁹⁷ See Article 15(7) and 19(2) of the CBD

example of complicability in determining benefits arising out of the utilization of genetic resources.

According to the Article 16(3) Contracting Parties should enact the relevant domestic legislation in order to have the right to access to the technology used for bioprospecting and the right that such technology will be transferred for their usage. The above-mentioned Article explicitly underlines the importance of such “benefit sharing” with regards to developing States. To what constitutes “fair and equitable” is left to the States to determine into their domestic legislation but of course in case of mutually agreed terms, contractors are free to decide on what sort of “benefit-sharing” they will consider “fair and equitable”.

One of the main players in this industry, the USA for instance, being not party to the CBD has not developed the legislation that would have focused on genetic resources but instead concern is generally based on conservation of the resources in general. Similarly the US law does not fulfil one of the main objectives of the CBD such as obligation of benefit sharing out of the utilization of the genetic resources. The USA followed the old adopted practice of open access to genetic resources and mostly imposes the fixed prices for administration costs.⁹⁸

3.1.3 Bonn Guidelines

It is ultimately important to mention that in 2002 COP adopted the Guidelines in order to assist Contracting States of the CBD in the development of the domestic legislation and policies on access and benefit-sharing arising out of the utilization of the genetic resources. There was a need to have the guidelines or model legislation to be followed by the States while implementing the CBD into national law so that the interpretation of the Articles of the Convention would not vary from State to State but have more unified regime.⁹⁹ According to the paragraph 12 of the Guidelines, its further intention is to give the guidance to the Parties in the development of national biodiversity strategies and action plans. In general, Bonn Guidelines added some procedural and substantive issues to the Article 15 of the CBD¹⁰⁰ and at the same time being voluntary in its nature established new principles and extended the substance of already existing ones that should be followed in order to meet the objectives of the Convention. For instance, in Appendix I, the Guidelines give the example of how the material transfer agreement can be concluded, what terms it might contain,

⁹⁸ Bass (n 40) 32

⁹⁹ Tully (n 57) 90

¹⁰⁰ *ibid*

while Appendix II talks about what may constitute to monetary or non-monetary benefits that should be shared “fairly and equally”. In Part IV (D) the Guidelines also help contractors to conclude mutually agreed terms by giving the lists of terms that should be taken into account.

Although the Guidelines are voluntary in its nature and there is no obligation for the States to implement them into their national laws, it serves as a perfect tool for the Governments to follow when it comes to the implementation of the CBD. Interestingly, similar to the International Undertaking on Plant Genetic Resources, that was non-binding instrument adopted by auspices of FAO and in 2001 by the final revision became legally binding, the Bonn Guidelines might also follow this pattern.¹⁰¹

Guidelines give the detailed list of functions of the competent national authorities, where they are established. Some of these functions can well be similarly transmitted to the international organizations that could be governing the management and protection of the marine areas beyond the national jurisdiction.

To conclude, the Bonn Guidelines is a good tool to be used for drafting national legislation, giving the detailed information about the functions of the authorities, ways of drafting agreements, sharing benefits, obtaining consents on access to genetic resources etc. Eventhough Guideline (as well as the CBD) is not applicable to the areas beyond national jurisdiction can well be used for the drafting codes of conduct for those areas. As for the sufficiency to use it for marine areas within national jurisdiction of the States, it is quite easy understandable and practical to be used and properly implemented. However Guidelines are often criticised by scholars for not being sufficient and exhaustive as certain ambiguity is still left with regards to some of the terms into the Convention that need to be addressed.

3.2 Applicability of UNCLOS

Although UNCLOS does not refer to the marine genetic resources, if its object and purpose will be well analysed it can be easily claimed that it intends to protect the marine biological diversity *inter alia* marine genetic resources.¹⁰² In its Preamble, it is stated that “[the Convention] will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment”.

¹⁰¹ *ibid*

¹⁰² Boyle (n 76) 139; See also Heidar (n 57) 620

It is often argued that, as during drafting of UNCLOS there were no negotiations about the marine genetic resources, it is not an applicable law.¹⁰³ Although it might be true that drafters having no information about marine genetic resources at that time could not protect it within the Articles of the Convention but it can be easily argued that their intention was to cover all of the major aspects of the law of the sea. The obvious purpose was to draft the Constitution of the Oceans that would unify all the issues concerning the law of the sea. Besides the fact that because of lack of information or impossibility to reach an agreement, certain aspects are still left outside the regulation of the UNCLOS, the Convention clearly indicates that within its Articles it intends to regulate conservation of marine resources (living or non-living) in general and thus include genetic resources.

UNCLOS recognises sovereign rights of State over its resources and provides several Articles applicable to them under its framework. Starting from the TS (Part II), EEZ (Part V) and CS (Part VII) that deal with the issues relating to the exploration, exploitation and management of the living resources to continue with the Part XIII that deals with the MSR within the maritime zones mentioned above. However it is often argued that in the context of “living resources” UNCLOS refers to the marine organisms exploited solely for food purposes.¹⁰⁴ In the contrary of this idea according to Article 194 (5) the measures taken in accordance with Part XII should be directed *inter alia* to the protection of the “rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and *other forms of marine life.*” (emphasis added) Thus including all kinds of living organisms. Thus UNCLOS as a Constitution of the oceans is not omitting from its applicability protection of other forms of marine life, which are the inseparable part of the marine ecosystem due to interrelated dependence of marine organisms on each–other.

This chapter will try to answer the questions around bioprospecting and whether or not it is regulated by the UNCLOS. Since the author argues that marine genetic resources fall within the scope of the Convention, each zone of the deep-sea will be analysed separately in order to distinguish the Articles applicable to these resources and to understand their status in each of the maritime zone that are located within the areas of national jurisdiction.

¹⁰³ Scovazzi, ‘Conservation and Sustainable Use of Marine Biodiversity’ (n 20) 11

¹⁰⁴ Fayette (n 73) 222

3.2.1 Bioprospecting

MSR is frequently undertaken in the marine environment for different purposes. Expanding knowledge about the processes undergoing into the sea is necessary for many reasons. For instance, collecting information on endangered species, rate of growing or declining population of living organisms, effects of global warming, possible influence of the certain activities need to be carried in a specific area, such as mining activities or placing underwater cables etc.

UNCLOS does not give definition of MSR as such but it contains several provisions regulating MSR spread into the different parts of the Convention and exclusively in Part XIII. Eventhough Articles about MSR takes a considerable part in UNCLOS, there remains ambiguity of what kind of activity is permitted and regulated under UNCLOS as MSR.

First of all it is important to understand that bioprospecting that is carried out on marine genetic resources resembles research-activity that is concentrated on commercial gain. Being the purpose the financial interest in marine genetic resources, it is often argued that bioprospecting is more related to conservation of marine genetic resources rather than MSR.¹⁰⁵ The mere difference between bioprospecting and MSR lies in the purpose of collection of data (sometimes resources) whereas in other terms both activities are almost identical. As Jeffery defines it, bioprospecting is “an activity that involves the search of biodiversity for resources, be they genetic or biochemical or both, for use in purely scientific and or commercial endeavours.”¹⁰⁶ Basically, bioprospecting is concerned with analysing samples of marine genetic material in order to find commercially valuable ones.¹⁰⁷ The term “bioprospecting” itself was first time used in connection to the interest in the terrestrial genetic materials.¹⁰⁸ LINGVA dictionary defines the bioprospecting as “the process of searching plants or animals for use as a source of commercially exploitable products.”¹⁰⁹ In

¹⁰⁵ Fayette (n 73) 264

¹⁰⁶ MI Jeffery, ‘Bioprospecting: Access to Genetic Resources and Benefit Sharing under the Convention on Biological Diversity and the Bonn Guidelines’ (2002) 6 *Singapore Journal of International and Comparative Law* 747, 755

¹⁰⁷ N Leroux and MM Mbengue, ‘Deep-Sea Marine Bioprospecting under UNCLOS and the CBD’

¹⁰⁸ Margaret F Hayes, ‘Charismatic Micro fauna: Marine Genetic Resources and the Law of the Sea’ in Myron H Nordquist and others (eds), *Law, Science & Ocean Management* (Martinus Nijhoff Publishers Leiden/Boston 2007) 683, 692

¹⁰⁹ Vyacheslav A Mukhin, Kjersti Lie Gabrielsen and Sten-Richard Birkely, ‘Bioprospevtng’, in Tore Jakobsen and Vladimir K Ozhigin (eds), *The Barents Sea, Ecosystem, Resources, Management*, (tapir academic press, Norway 2011) 710; Much broad definition was given my the International Expert Group convened by the Research Council of the Norway, sating that “bioprospecting covers commercial purpose research

other words when research is carried out for the genetic resources and it has a commercial purpose, this type of research is called “bioprospecting”.

As for the definition of marine bioprospecting, some of the scholars propose to define it as “a systematic search for interesting and unique genes, molecules and organisms for the marine environment with features that could be useful to society and/or have potential for commercial development.”¹¹⁰ As the CBD secretariat defined bioprospecting it represents “the exploration of biodiversity for commercially valuable genetic and biochemical resources” and “the process of gathering information from the biosphere on the molecular composition of genetic resources for the development of new commercial products.”¹¹¹

Thus, as for the question whether or not bioprospecting is MSR the answer should be affirmative. Furthermore, the provisions of UNCLOS related to MSR are applicable to bioprospecting as well, since in fact UNCLOS indirectly differentiate two types of MSR: “pure” and “applied” research. The later takes place when MSR is carried for commercial purposes. Such a research involves “exploration and exploitation of natural resources.”¹¹² As for in other terms such as objectives, ways and means for carrying activities both types of MSR are identical.

The opinions among scientists differ on whether or not bioprospecting on marine genetic resources can be harmful to the ecosystem. Some of them argue that the research is undertaken in a way to minimize the effects on the environment and only small numbers of samples are taken from the sites for further investigation and that only potential problem might arise if the promising results make them return to the sites for collection more samples and that this interruption does not make it necessary to enact new regulations.¹¹³ They argue that the idea of bioprospecting is to detect chemical structures or derivatives of new bioactive compounds, which can be then chemically made and as this does not need much of the amount of

and development, building on use of natural occurring compounds, all the way from first discovery, over patenting, benchmarking, improvement, development and commercialization.” International Expert Group convened by the Research Council of the Norway, ‘Possibilities for a bioprospecting commitment in Norway 2008-2020’, 2008, report available at www.forskningsradet.no in Leroux (n 107)

¹¹⁰ Mukhin (n 109) 710

¹¹¹ Progress Report on the Implementation of the Programmes of Work on the Biological Diversity of Inland Water Ecosystems, Marine and Coastal Biological Diversity, and Forest Biological Diversity - Information on Marine and Coastal Genetic Resources, Including Bioprospecting” (UNEP/CBD/COP/5/INF/7) in Salvatore Arico and Charlotte Salpin, *Bioprospecting of Genetic Resources in the Deep Sea-bed: Scientific and Policy Aspects*, UNU-IAS Report 2005, 15

¹¹² Article 246 (5)(1)

¹¹³ Hayes (n 108) 697; See Mukhin (n 109) 714

resources to be extract, bioprospecting can be viewed as environmentally sustainable.¹¹⁴ However, other group of scholars and scientists argue that bioprospecting on marine genetic resources is one of the major threats to the vulnerable ecosystems. For example, to get 1g of the potential anti-cancer drug Yondelis®, 1 metric tone (wet weight) of the ascidian tunicate *Ecteinascidia turbinata* is required to be harvested. Similarly, for the 300 mg mixture of two halichondrin (a powerful cytostatic poliketide) 1 metric ton of the sponge *Lissodendoryx* should be harvested.¹¹⁵ Thus, in fact for a minimum netto of the drugs for testing, quite a large number of resources are collected.

It should be taken into account that eventhough genetic material for which the bioprospecting is carried out is a form of information, it is found in the cell of living organisms and thus conservation of marine genetic resources involves conservation of the organisms.¹¹⁶ In addition to this, these vulnerable ecosystems are slow in distributance and by increasing number of private sector getting involved; bioprospecting represents threat that may cause their disappearance. Besides, bioprospecting does not represent the threat to the deep-sea marine life only because it includes harvesting of the resources. Deep-sea habitats might also be under the danger due to the pollution caused by the underwater submarines while carrying out bioprospecting. Similarly light and noise pollution or introduction to the alien species can be equally harmful to the deep-sea ecosystem especially due to the existing darkness and silence into the deep-sea that these organism are used to.¹¹⁷ Thus, special attention needs to be paid on the ways of conducting bioprospecting activities.

3.2.2 Marine Genetic Resources within Exclusive Economic Zone and Continental Shelf

As it was already discussed above bioprospecting represents MSR that addressed by UNCLOS. Bioprospecting within national jurisdiction of States could also be undertaken within Territorial Sea or internal waters of the States, however as the paper is concerned with the marine genetic resources of the deep-sea, the discussions in this paragraph will take place about the applicable Articles of the UNCLOS on marine genetic resources only within EEZ and CS.

Under Article 56 (1) of UNCLOS it is stated that

¹¹⁴ Mukhin (n 109) 715

¹¹⁵ Calle (n 39) 214

¹¹⁶ Fayette (n 73) 227

¹¹⁷ Leary, 'Bioprospecting and the Genetic Resources' (n 7) 141, 165-167

In the exclusive economic zone, the coastal State has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil.

Since marine genetic resources represent parts of the natural resources or the resources themselves, the above-mentioned Article concerns marine genetic resources as well. In addition to this all other relevant Articles of UNCLOS (Articles 61-68) concerning living resource of the EEZ are also applicable. Thus, in EEZ coastal State has sovereign rights over its marine genetic resources and thus the right to regulate activities within EEZ, which might include determination of the allowable harvestable quotas, access conditions, bioprospecting etc.

As for the applicable law to the marine genetic resources in terms of Continental Shelf, according to the Article 77 (1) of UNCLOS, States have sovereign rights over their natural resources; paragraph 4 of the same Article explains that such natural resources include living organisms in case they represent sedentary species.¹¹⁸ Thus States have sovereign rights over genetic resources of sedentary species of the Continental Shelf. The definition of sedentary species has been subject of the long discussions¹¹⁹ which then was concluded in Article 77(4) of UNCLOS, however still represents bouquet of undefined terms. As Chie Kojima remarks it is still unclear “to what extent sedentary fisheries should stay in constant physical contact with seabed or subsoil” in order to be classified as such, taking into account that some of the sedentary species change their connection with the seabed and subsoil during their lifetime.¹²⁰ Especially, when it comes to the marine genetic resources of the deep-sea it is difficult to identify what can be considered as “harvestable stage” as some of the organisms such as bacteria and archaea are not collected in a manner to be viewed as ‘harvesting.’¹²¹

Thus some of the deep-sea organisms will fall within the regime of the Continental Shelf while to others the regime of the EEZ will be applicable. Nevertheless since the State obligations and rights over their living organisms of the EEZ and sedentary species of the CS basically coincide, their distinction does not arise much problems within 200 nautical miles of the CS. Except when it comes to the living organisms of the EEZ according to the Article 62 (2) of UNCLOS States have duty to “harvests the entire

¹¹⁸ See Article 77, Sedentary species are defined as “organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil. Article 77 (4)

¹¹⁹ Leroux (n 107)

¹²⁰ Chie Kojima, “Fisheries, Sedentary”, (Heidelberg and Oxford University Press 2009) Max Plank Institute for Comparative Public Law and International Law

¹²¹ Leary, ‘Bioprospecting and the Genetic Resources’ (n 7) 150

allowable catch” whereas there is no such obligation towards sedentary species of the CS. Nevertheless this scenario does not arise a problem worth drafting new regulatory norms.

Main controversy arises about the applicable norms on the sedentary species of the continental shelf beyond 200 nautical miles or when EEZ is not declared. In other words it is difficult to identify whether or not certain living organisms can be considered as sedentary species of CS and the provisions applicable to this maritime zone should apply or should be considered as living organisms of the HS and the regime of the HS will be applicable. As it is often observed by scholars, in the situation where activities in the water column is governed by different regime from on the regime applicable to the ocean floor, brings further complications for states to exercise their sovereign rights.¹²² Especially when it comes to the contradictive regimes of the HS for the water column and regime of the CS for the ocean floor it is vital importance to make a clear distinction between sedentary and non-sedentary species. However, author is the view that such a distinction among the organisms will always be subject of debate and sometimes as it is argued in the paper be impossible.

In addition to this what should be mentioned is that regime of the CS will not apply to the certain sedentary species either. That is when such resources are found near oceanic ridges of the deep ocean floor as According to Article 76 (3) of UNCLOS, continental margin (till outer edge of which CS is established) does not include “the deep ocean floor with its oceanic ridges or the subsoil thereof”. Thus, in such a scenario either regime of the EEZ or HS will apply. An example could be most of the hydrothermal vent communities that are located on the mid-ocean ridge.

As for the bioprospecting, according to the Article 246 (1) it also falls under the exclusive regulation of the coastal States in accordance of the provisions of UNCLOS. In the next paragraph of the same Article it is clearly indicated that in order to carry out MSR consent of the coastal State is required. Although the consent should not be unreasonably denied (Article 246(3)) by virtue of the Article 246 (5) States might reject the project of the MSR for different reasons.¹²³ However, when it comes to the MSR to be carried out

¹²² Joanna Mossop, “Regulating Uses of Marine Biodiversity on the Outer Continental Shelf” in Davor Vidas (ed), *Law, technology and Science for Oceans in Globalisation, IUU Fishing, Oil Pollution, Bioprospecting, Outer Continental Shelf* (Martinus Nijhoff Publishers, Leiden, Boston 2012) 319, 320

¹²³ “Coastal States may however in their discretion withhold their consent to the conduct of a marine scientific research project of another State or competent international organization in the exclusive economic zone or on the continental shelf of the coastal State if that project: (a) is of direct significance for the exploration and exploitation of natural resources, whether living or non-living; (b) involves drilling into the continental shelf, the use of

on the outer Continental Shelf, coastal states right to reject MSR is very much limited.

Interesting fact to mention here is that, as Joanna Mossop in her paper fairly notices, coastal States have more rights to control bioprospecting on the outer continental shelf if bioprospecting is considered to be exploitation of living resources rather than MSR.¹²⁴ The discretion to the States to define bioprospecting under their domestic legislation on different grounds should be eradicated and the unified definition of the activity becomes more important.

There are other provisions also found to be applicable to the marine genetic resources. However, they are very broad and represent general principles of international law.¹²⁵ Such an example could be Article 192 of UNCLOS that imposes an obligation on States to “protect and preserve the environment” and Article 193 of UNCLOS, according to which States have an obligation to exploit their natural resources environmentally sound ways.

3.3 Practice of the States

When it comes to the protection of the marine environment UNCLOS encourages regional co-operation among the State Parties and the competent international organisation. In Article 197 of the Convention it is stated:

States shall cooperate on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features.

This idea was also supported by the FAO and UNEP thus the practice have been developed through the most of the regions. According to UNEP today more that 143 States are involved in 13 regional sea programmes that have been established by the auspices of UNEP.¹²⁶ In addition to this FAO and

explosives or the introduction of harmful substances into the marine environment; (c) involves the construction, operation or use of artificial islands, installations and structures referred to in articles 60 and 80; (d) contains information communicated pursuant to article 248 regarding the nature and objectives of the project which is inaccurate or if the researching State or competent international organization has outstanding obligations to the coastal State from a prior research project.”

¹²⁴ Mossop (n 122) 324

¹²⁵ General Principles of the International Environmental Law applicable to marine genetic resources will be further addressed in chapter 4.2

¹²⁶ For more information see UNEP, Regional Seas Programme <<http://www.unep.org/regionalseas/about/default.asp>> accessed 17 October 2012

UNGA encourage States to cooperate in establishment and extension of the regional fisheries management organisations. RFMOs usually address either address specific fish stock or all fish in certain region.¹²⁷

One of the main trends towards protection of the vulnerable ecosystems of the deep-sea (and not only) among the States is establishment of the Marine Protected Areas. There are several identical, sometimes overlapping definitions of MPAs with some specific differences. Erik Jaap Molenaar defines MPAs as

A spatially defined area of the marine environment, whether in two or three dimensions, where regulations for the purpose of the conservation and sustainable use of marine biodiversity is more stringent than in the adjacent area.¹²⁸

The definition adopted by General Assembly of the IUCN is following:

Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.¹²⁹

There are already several MPA established worldwide. The leading among the countries is Australia. MPAs in Australia are managed either by State, Territory, and Commonwealth Government Agencies or by several Government Agencies acting together, depending on the location of the MPA.¹³⁰ Each of the Government being Commonwealth, State or Northern Territory, uses their own legislation and management plans for the MPAs or some of them such as Great Australia Bight Marine Park, Ningaloo Park, and Solitary Islands marine Reserve, are within cross-jurisdictional management.¹³¹

Another example of State establishing MPA can be in Canada. Canada established Endeavour Hydrothermal Vent Marine Protected Area within its EEZ, which has been officially declared as such in March 2003.¹³² The regulations and management of the MPAs differ from State to State. For instance Canada within its Endeavour Hydrothermal Vent MPA does not

¹²⁷ Fayette (n 73) 251

¹²⁸ Molenaar (n 6) 629

¹²⁹ Resolution 17.38 (1988) of General Assembly of the World Conservation Union, reconfirmed in the Resolution 19.46 (1994) cited in Molenaar (n 6) 629

¹³⁰ Australian Government, Department of Sustainability, Environment, Water Population and Communities; Marine Protected Areas <<http://www.environment.gov.au/coasts/mpa/about/index.html>>

¹³¹ *ibid*

¹³² Leary, 'Bioprospecting and the Genetic Resources' (n 7) Footnote 76

regulate bioprospecting at all, while Portugal in the Menez Gwen Hydrothermal vent site, which is located within Portuguese EEZ, totally prohibited bioprospecting.¹³³

IUCN has established internationally recognised Protected Area categories, which can be applied by States;¹³⁴ in 2008 it even issued a Guidelines in order to assist states in using this type of categorisation of the MPAs. However, it should be kept in mind that for each of the site special management is needed to be applied.

At the fifth meeting of the Working Group the delegations expressed a view that area-based management tools would play an important role in terms of protection of the marine ecosystem at the national, regional and global level.¹³⁵

Same approach has been taken by the Contracting Parties to the Convention for the Protection of the Marine Environment of the North-East Atlantic¹³⁶ willing to design a network of marine protected areas.¹³⁷

3.4 Remaining Problems or Sufficient Protection?!

As can be seen protection of marine genetic resources has been widely discussed among the sovereign States. Applying the general principles and regulations established by the CBD in addition to the marine environmental protection and biodiversity preservation obligations imposed by UNCLOS, created a general blueprint of the rules that should be followed and further implemented in national jurisdictions. Although UNCLOS does not specifically refer to marine genetic resources it has been claimed by the paper that the general applicability of the Convention to the marine resources covers the marine genetic resources as well. Neither the CBD mentions marine genetic resources within its provisions but it has been argued that the Convention applies to all the genetic resources including marine representatives and this has been reaffirmed not once by the

¹³³ *ibid*

¹³⁴ See Supplement B

¹³⁵ United Nations General Assembly, Report of the Working Group 67st Session, Doc. A/67/95 of 13 June 2012 at p. 5, Para 20, at <http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm> accessed 14 October 2012

¹³⁶ OSPAR Convention, (adopted 22 September 1992, entered into force 25 March 1998) <http://www.ospar.org/content/content.asp?menu=00340108070000_000000_000000> accessed 1 October 2012

¹³⁷ Leary, 'Bioprospecting and the Genetic Resources' (n 7) 171

continues debates and discussions of the COP, exclusively dedicated to marine genetic resources.

Although two major Conventions together with regional agreements or other instruments and general principles of international law are applicable to the deep-sea marine genetic resources within the areas of national jurisdiction, none of them is specifically addressing the one. However, due to the practice taken by several States to establish MPAs or other means for the protection of biodiversity of the deep-sea, including advancing regional cooperation the problem of the gap in international law for the protection of MGR exclusively does not seem much serious.

The remaining problem in terms of protection of MGR within the areas of national jurisdiction lays in lack of the proper implementation of existing instruments and in the development of national legislation of States. It is essential to differentiate State's "prescriptive" and "enforcement" jurisdiction. First refers to the State's competence to enact national law or implement international regulations. "Enforcement" jurisdiction concerns State's competence to punish any violations of these regulations.¹³⁸ It can be said that sometimes none of them is done in most of the States, mostly developing ones.

The trend is that the best possible instrument to protect marine environment within the areas of national jurisdiction is to establish MPAs.¹³⁹ However, the problem that most States are facing is the proper management plans. An example could be Australia, which has taken outrageous steps in terms of protection of the marine environment through establishing marine parks. The results of such steps have been reported continuously recently in the news stating that new trend of extension of the areas of the marine parks

¹³⁸ Alan Khee-Jin Tan, "The Regulation of Vessel-Source Marine Pollution: Reconciling the Maritime and Coastal State Interests" (1997) *Singapore Journal of International & Comparative Law* 357

¹³⁹ There is also an idea of establishment of MPAs beyond the limits of national jurisdiction, however in contrast with such practice to be taken within the jurisdiction of the States author thinks that ABNJ it will not be that effective for number of reasons. For instance the lack of governing body in the areas that "does not belong to anyone" and most importantly even if certain States agree on establishment of MPA in a specific region, no obligatory regime would work for the third States. Such a regional agreement will be limited to the parties involved.

At the fifth meeting of the Working Group there was a concern expressed about the legitimacy of the establishment of the marine protected areas ABNJ by state unilaterally or by the regional agreements. See United Nations General Assembly, Report of the Working Group 67th Session, Doc. A/67/95 of 13 June 2012 at p. 5, Para 18, at <http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm> accessed 14 October 2012

have resulted in reduction of the fish in market and that hundreds of fishermen are obliged to leave the fish market.¹⁴⁰

Further steps need to be taken to come up with the relevant management plans for the MPAs individually for each region taking into account the needs of the population depending on the marine resources together with the need of sustainable development of such resources.

To conclude, the existing framework of international law and the State practice is quite comprehensive when it comes to the protection of MGR within the areas of national jurisdiction. The further steps need only to be taken in proper implementation of these norms in their domestic law. This might happen with issuing more guidelines in order to assist States in implementation of the international legal instruments. For those not wishing to impose on themselves international responsibilities, the reporting system and international evaluation by international bodies could serve as solution.

Furthermore the awareness should be raised among the nations for need and urgency of protection of the marine environment. This can happen by the on-going international conferences and meeting of the States delegations where the examples of States acting in accordance with the international obligations would have opportunity to set examples and share the experiences.

¹⁴⁰ IN BRIEF - Overhaul after report finds fishing in deep water; Australia May 26, 2012 <http://www.fis.com/fis/worldnews/search_brief.asp?l=e&id=52549&ndb=1> accessed 14 October 2012

4 Conservation and Protection of the Deep-Sea Genetic Resources Beyond the Areas of National Jurisdiction

4.1 Applicability of UNCLOS

UNCLOS is regarded as a “constitution of the oceans” and represents the most significant treaty when the law of the sea is concerned. As Professor Edgar Gold remarks, the Convention “lead down a regime for the protection of the marine environment at the highest global level.”¹⁴¹ It is regarded as a blueprint for other International Conventions. Making reservations to the provisions of UNCLOS are prohibited (Article 309), it should be accepted as a package deal. Moreover by virtue of Article 311 it gets superiority over other Conventions, stating that future agreement should be concluded in a way to meet certain requirements, such as consistency with its objectives, purposes and basic principles and does not interfere with the rights and obligations of other States. It establishes a legal framework for the exploitation, exploration, conservation and management of the marine resources found beyond the areas of national jurisdiction among others and for this regard designs two different maritime zones: High Seas (Part VII) and the Area (Part XI), also regulates MSR in these areas (Part XIII) and ensures the protection of the marine environment in general under the Part XII.

Even though UNCLOS does not make a specific indication on the marine genetic resources, as it was mentioned already its Preamble indicates that the intention of the Convention was to include all of the resources of the sea. This has been also reaffirmed on the meeting of Working Group by several delegations stating “United Nations Convention on the Law of the Sea provided the legal framework for all activities in the oceans and seas, including with respect to marine genetic resources beyond the areas of national jurisdiction.”¹⁴² Furthermore, by virtue of the Article 119, UNCLOS imposes obligation on States to protect “species associated with

¹⁴¹ Edgar Gold, *Maritime Law (Canadian Perspective)* (Irvin Law 2003) 664

¹⁴² United Nations General Assembly, 66th Session, Doc. A/66/119 of 30 June 2011, at p.5, para. 15

<<http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm>>
accessed 19 June 2012

or dependent upon harvested species”. In other words UNCLOS, realising the importance of the life chain in the sea, tends to protect the whole ecosystem.

The major questions that arise are that which is the regime that is applicable for those resources in the deep-sea¹⁴³, beyond the areas of the national jurisdiction? Is that the regime of the Area or the High Seas and whether that can be considered as a sufficient regulation?!

Trying to answer the questions of applicability of UNCLOS to marine genetic resources it is important to analyse the outcomes of the meetings of the Working Group that held already five meetings until recently¹⁴⁴ as from the very first meeting the delegations discussed the issues relating to the marine genetic resources. The views were divided among the developed and developing countries. Former group arguing that marine genetic resources were falling under the regime of the High Seas since the representatives of this group are mostly user States, thus prefer to have free access to the resources and since they are the ones that have ability to possess relevant technology in order to access deep-sea resources High Sea regime would be more beneficial for them. Whereas developing countries held a view that these resources are governed by the regime of the Area as it is under the UNCLOS. This group of the States, unable to be involved in bioprospecting due to the costs needed, are happy to consider deep-sea genetic resources as a common heritage of mankind so that they could also benefit from the financial gain these commercially valuable organisms are promising.

The study that was carried out by the CBD Secretariat and DOALOS to study issues relating to the relationship of the CBD and UNCLOS with regard to the deep-sea genetic resources concluded that neither of these Conventions provided appropriate legal regime for the protection of the resources and regulation of the activities associated with the deep-sea inhabitants.¹⁴⁵

Very last meeting of the Working Group have been held in June of this year during the drafting of the paper and the controversial ideas among the delegations have not changed. Some of the delegations held the view that Part XI of UNCLOS is only applicable to the mineral resources of the Area

¹⁴³ There is no official definition of deep-sea provided, usually it is considered to be the areas deeper than 200 m that can be found both, within and beyond the areas of national jurisdiction. For more information see DW Jaap and S Wilkinson, ‘Deep-Sea Resources and Fisheries’ paper prepared for Expert Consultation on Deep-Sea Fisheries in the High Seas (Bangkok, Thailand 21-23 November 2006) 39-41

¹⁴⁴ First meeting - from 13 to 17 February 2006; Fifth meeting - from 7 to 11 May 2012.

¹⁴⁵ König, (n 3) 154

and some others were arguing in favour of the applicability of the Part VII of the Convention. On the other hand some of the delegations considered General Assembly Resolution 2749 (XXV) and Part XI of the Convention, to be part of customary international law and was applicable to the Area all of its resources while others considered that there was a vacuum for legislation.¹⁴⁶ Thus the situation is basically the same no agreement has been reached during the years of negotiations. As Professor Louise ironically states “they could not even agree to state in writing that they could not agree”.¹⁴⁷

4.1.1 Regime of the Area

According to the Article 1 (1) (1) “’Area’ means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.” The regime of the Area has a long time history of development and represents one of the unique approaches. As it is codified in UNCLOS the resources of Area are common heritage of mankind. This principle is widely applied to specific regions and special resources, such as the Moon and its natural resources¹⁴⁸ and Antarctica.¹⁴⁹ The principles of the CHM are not necessarily the same for each of the matter they apply, but share the basic characteristics which will be discussed below. It should also be mentioned before that there is a controversy among the scholars whether or not the regime of the Area that was established by the Resolutions of the General Assembly and later by UNCLOS represents a satisfactory approach or not. The author is a view that CHM still is to be considered as one of the best regimes that focuses on the protection of the marine environment as fostering environmentally sound uses of the Area and its resources and at the same time encouraging development of MSR.

¹⁴⁶ United Nations General Assembly, Report of the Working Group 67st Session, Doc. A/67/95 of 13 June 2012 at p. 5, Para 15-17, at <http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm> accessed 14 October 2012

¹⁴⁷ Fayette (n 73) 225

¹⁴⁸ See Article 11 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Treaty) (adopted 18 December, 1979 entered into force 11 July 1984)

¹⁴⁹ See Preamble of Antarctic Treaty. (adopted 1 December 1959 entered into force 23 June 1961) The Principle is not directly mentioned in the Treat, however in its Preamble it states that “in the interest of all mankind ... Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become a scene or object of international disorder.”

4.1.1.1 The Principle of the Common Heritage of Mankind

Delimitation of the Continental Shelf as it was established by the Article 1 of the Geneva Convention on the Continental Shelf¹⁵⁰ did not seem satisfactory as the development of technology could allow States the exploitation of natural resources of the ocean floor without any limits. By virtue of aforesaid Article technologically developed and wealthy States could increase their Continental Shelves that might lead to unjustifiable economical benefits and to a danger of full nationalization of the ocean floor. Furthermore, according to the 1958 Convention on the High Seas, access to the resources was free to everyone, solely taking into account the interests of other States to enjoy the same rights.¹⁵¹ This conditioned Ambassador of Malta Arvid Pardo in November 1967 to make his famous proposal in his speech at 22nd Session of the United Nations General Assembly to declare deep seabed and the ocean floor as “the Common Heritage of Mankind.” In his opinion the seabed and ocean floor should have been governed by the international regime and exploited only for the peaceful purposes and for the benefit of mankind.¹⁵²

Interestingly this idea from the very beginning was opposed by the USSR and other socialist countries although the concept of the Common Heritage of Mankind was very “socialist”. They claimed that “obtaining profit

¹⁵⁰ Convention on the Continental Shelf, adopted at Geneva 29 April 1958, entered into force on 10 June 1964. UNTS, Vol. 499, p. 311

¹⁵¹ Convention on the High Seas, adopted at Geneva, 29 April 1958, entered into force on 30 September 1962, UNTS, Vol. 450, p. 11, p. 82

¹⁵² Antonio Cassese, *International Law in a Divided World*, (Clarendon Press, Oxford, 1986) 380

Important to note that just before the proposal of Pardo meeting of the World Peace through Law Conference adopted Resolution in 13 July 1967 that declared the whole High Seas as the common heritage of mankind. UN Doc. A/C.1/PV.1515, P. 14, para. 30 cited in Kemal Baslar, *The Concept of the Common Heritage of Mankind in International Law, Development in International Law* Vol. 30 (Martinus Nijhoff Publishers The Hague/Boston/London 1998) 222

Even years before, in 1927 there was a proposal made by Argentine jurist Jose Leon Suarez at the League of Nations that all the living resources of the seas be considered as the “heritage of mankind”. T Scovazzi, *The Seabed beyond the Limits of National Jurisdiction: General and Institutional Aspects*, in *The International Legal Regime of Areas beyond National Jurisdiction: Current and Future Developments* AG Oude Elferink & EJ Molenaar (eds), at 43, footnote 2 (2010) cited in Helmut Tuerk, *Reflections of the Contemporary Law of the Sea*, Publications on Ocean Development, (Martinus Nijhoff Publishers, 2012) 32

Moreover, Judge Wolfrum argues that according to the UNCLOS, High Seas are no longer considered as *res communis* and that despite the fact that it is not treated as CHM, by virtue of the Article 192, the Convention imposes shared obligation to the States to “protect and preserve the marine environment.” Wolfrum R ‘Purposes and Principles of International Environmental Law’ (1990) 33 GYIL 308-330 cited in Baslar (n 150) 237 See also Jutta Brunnée ‘Common Areas, Common Heritage and Common Concern’, in Daniel Bodansky, Jutta Brunnée, Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2007) 550, 558

without working is against socialism.”¹⁵³ The opposing idea came from the developed countries as well. They did not want to share profits gained from the exploitation of the seabed with the developing States.¹⁵⁴

After all, Pardo’s proposal was followed by the adoption of the Resolution 2749 by the UNGA. The General Assembly in its Preamble of the Resolution 2749 stated that the international community recognised that “the existing legal regime of the high seas does not provide substantive rules for regulating the exploration of the ... area and the exploitation of its resources” and that “exploration of the area and the exploitation of its resources shall be carried out for the benefit of mankind”.¹⁵⁵ Thus GA through the Resolution declared that “the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction (hereinafter referred to as the Area), as well as the resources of the area, are the common heritage of mankind”.¹⁵⁶

This principle has been incorporated in the Article 136 of the UNCLOS, stating that “[T]he Area and its resources are the common heritage of mankind”. This Article should be read together with the Article 140 according to which beneficiaries are not only States but also the whole mankind. As Judge Wolfrum states it is remarkable that instead of “all States” the beneficiary is the “mankind”.¹⁵⁷ Thus including not only State Parties but also “the people who have not attained full independence or other self-governing status recognised by the United Nations.”¹⁵⁸ However, some of the provisions of the UNCLOS, mostly procedural, relating to the CHM had become the reasons of contradiction among States. Developed countries argued that it was not based on market-oriented approach and was much favour to the developing States.¹⁵⁹ This part of the Convention had become also the reason that UNCLOS has not been adopted on a consensus, as it was desired.¹⁶⁰

¹⁵³ S Oda, ‘New Law of the Sea and Common Heritage of Mankind: Some Comments’, in *Legal Aspects of the New International Economic Order*, ed. K Hossain (Oxford, 1980) 171 cited in Cassese (n 152) 381

¹⁵⁴ Cassese (n 152) 382

¹⁵⁵ United Nations General Assembly, 25th Session, Resolution 2749, of 17 December 1970, Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of the National Jurisdiction, <<http://www.un.org/Depts/dhl/resguide/r25.htm>> accessed 18 May 2012

¹⁵⁶ *ibid*

¹⁵⁷ R Wolfrum, ‘The Principle of the Common Heritage of Mankind’ (1983) *Max-Planck-Institut für ausländisches öffentliches Recht und Völkerrecht* 312, 318

¹⁵⁸ See Article 140 of the UNCLOS

¹⁵⁹ Tuerk (n 152) 34-35

¹⁶⁰ It was submitted for voting after consensus could not be achieved and passed with the 130 votes in favour, 4 against and 17 abstentions. The criticism was mostly related to the

Although neither Resolutions of the General Assembly nor UNCLOS give a definition of the CHM it implies that “it [is] open to use by international community but [is] not owed by it”.¹⁶¹ The concept further can be understood by the principles established in the following Articles of the Convention that are Articles 136-149 that govern the Area.

One of such principles would involve the prohibition to appropriate or declare sovereignty or exercise sovereign rights over the Area or its resources (Article 137). Another element of the CHM is an equitable sharing of benefits (Article 140) that includes that the activities in the Area should be carried out not only on the interest of a single State but for the mankind as a whole involving also transfer of technology and the information among the States especially to the developing ones.¹⁶² Although the author regards that transfer of technology is one of the fundamental element of the “benefit-sharing”, the compromises that have been made during the drafting of the Implementation Agreement involved the suppression off the obligatory requirement of transfer of technology. Instead, now the Convention facilitates co-operation among States with this regard as the industrialized countries of which participation in the Convention and in the mining activities was fundamental, did not wish to transfer the technology to other States basing their arguments on the intellectual property rights.¹⁶³

Other characteristics of the CHM are that the Area should be used only for the peaceful purposes (Article 141), should be managed by the International Seabed Authority (Article 140 (2)) and that the marine-scientific research should be promoted (Article 143). Finally, the obligation to protect the marine environment, its flora and fauna (Article 145) represents one of the fundamental principles of the Common Heritage of Mankind.

It is difficult to argue whether or not the provisions of the CHM, applicable to the Area, are peremptory norm of international law. Besides the long-time practice and no current objection of the States to the regime, when Chile proposed that the Articles of the UNCLOS on the CHM was *jus cogens*, the

Part XI and its provisions relating to the mandatory nature of transfer of technology, decision making procedure of the Council of ISA and other financial aspects. Scovazzi, ‘Conservation and Sustainable Use of Marine Biodiversity’ (n 20)

¹⁶¹ Tuerk (n 152) 33

¹⁶² See Article 144 of UNCLOS; “‘technology’ has been defined in Annex III, Article 5 (8) as “the specialized equipment and technical know-how, including manuals, design, operating instructions, training and technical advice and assistance, necessary to assemble, maintain and operate a viable system and the legal right to use items for that purpose on a non-exclusive basis.”

¹⁶³ See Section 5, para. 1 and 2 of the Annex to the Implementation Agreement.

idea was rejected by some of the countries.¹⁶⁴ However, according to the Article 311 of the UNCLOS, even though States are allowed to conclude separate agreements that would modify the provisions of the Convention, these agreements should not be in contrary to the objectives and purposes of the Convention and should not interfere with the applicability of the basic principles. It is important to note that Part XI has been changed by the Implementation Agreement¹⁶⁵, as the regime of the Part XI was not accepted by the industrialized countries and was preventing them from ratification of the Convention at all. This was the reason why United Nations Secretary-General renewed the consultations for the period of 1990-94 in order to modify the disputed provisions and allow the treaty to enter into force with the wide majority of States being party to it. However, the changes that have been made are basically procedural and does not interfere or contradict with the primary principles of the CHM established by the Convention. In the Preamble, the Implementation Agreement reaffirms that the Area as well as its resources are the “common heritage of mankind”.

4.1.1.2 Mandate of the International Seabed Authority over the Marine Genetic Resources

In order to govern the Area and its resources the International Community decided that there was a need for a separate international organization. To this extent one of the international institutions that has been established by the UNCLOS is International Seabed Authority that is based in Jamaica and came into existence from the date UNCLOS entered into force in 14 November 1994 and became fully operational in 1996.¹⁶⁶ It comprises of three main organs: Assembly that is composed of all member States; Council and Secretariat. Definition of the ISA is given under the Article 157(1) of the UNCLOS according to which it represents an international organization that gives opportunity to the State Parties in accordance with the Part XI to “organize and control activities in the Area, particularly with a view to *administering the resources* of the Area”. (emphasis added) Thus, ISA was given the mandate that involved not only taking control over the

¹⁶⁴ Conference Documents: MC/14, 29 August 1979 and G/P/9, 5 August 1980 cited in Cassese (n 152) 386

For the arguments of why CHM should be regarded as customary international law. See Wolfrum (n 157) 333-337

¹⁶⁵ Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, was adopted on 28 July 1994 and entered into force on 28 July 1996

The Agreement become the integral part of the Convention and according to the Article 2 of the agreement “the provisions of the Part XI and this Agreement shall be interpreted and applied together as a single instrument” with the prevailing status of the provisions of the Agreement in case of contradiction

¹⁶⁶ ISA <<http://www.isa.org.jm/en/about>> accessed 22 May 2012

activities carried out in the Area but also to regulate the sharing of the benefits arising out of the utilization of the resources of the Area. The definition of the "activities in the Area" is provided under Article 1 paragraph (1)(3) of the Convention and that includes "all activities of exploration for, and exploitation of, the resources of the Area".

Seabed Dispute Chamber of the ITLOS in its Advisory Opinion on Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, stated that "activities in the Area" includes among others activities listed in the Article 145 of the UNCLOS in respect of which ISA is responsible to adopt appropriate rules, regulations and procedures. Such activities are: "drilling, dredging, excavation, disposal of waste, construction and operation and maintenance of installations, pipelines and other devices related to such activities."¹⁶⁷

The major controversy among the ideas arises when it comes to the definition of the "resources of the Area". From the first sight it seems that in the first Article where there are provided definitions of the terms for the purposes of the Convention, for the definition of "activities in the Area", the drafters had in mind to include resources of the Area in general, in other words any type of resources found in this maritime zone. In this case it would be easy to argue that every single resource living or non-living that is connected to this zone is governed by the regime established for the Area thus including marine genetic resources of the deep seabed and administrated by the ISA. This idea has been expressed by several delegations at the meeting of the Working Group including G77¹⁶⁸ and China. Their arguments were based on the Resolution 2749 (XXV) of the General Assembly¹⁶⁹ that declared that "the seabed and ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction (hereinafter referred to as the area), as well as the resources of the area, are the common heritage of mankind", which they consider to be a customary international

¹⁶⁷ Case N17, Advisory Opinion on Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, ITLOS, 1 February 2011

¹⁶⁸ "Group 77" unifies developing countries that have signed "Joint Declaration of the Seventy-Seven Countries" at the first Session of UNCTAD and was established on 15 June 1964, currently it involves 131 countries but the name was preserved for the historical purposes. The Group of 77 at the United Nations <<http://www.g77.org/doc/index.html>> accessed 14 June 2012

¹⁶⁹ United Nations General Assembly, 25th Session, Resolution 2749, of 17 December 1970, Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of the National Jurisdiction, <<http://www.un.org/Depts/dhl/resguide/r25.htm>> accessed 19 June 2012

law and the resources include both living and non-living organisms.¹⁷⁰ Similar provision is incorporated in Article 136 of UNCLOS.

However, Article 133 (a) gives the special definition to the “resources” for the purpose of the Part XI exclusively. Thus it narrowed down the definition to “solid, liquid or gaseous mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules”. This Article makes it difficult to argue that ISA has the mandate over living resources as well, no matter how fair and equitable approach that would be.

By virtue of the Article 145 of UNCLOS, ISA does have a mandate to adopt rules, regulations and procedures for the protection of the marine environment, its flora and fauna for the protection and conservation of the natural resources of the Area. However, ISA has these functions only regarding to the “activities in the Area” as defined by the Article 1 (1) (3) of the UNCLOS. The same requirement is set out in Annex III, Article 17, paragraph 1(b)(xii) according to which ISA shall adopt and uniformly apply rules, regulations and procedures in connection to the “mining standards and practices, including those relating to operational safety, conservation of the resources and the protection of the marine environment” and also it should enact rules, regulations and procedures with regards to the protection of the marine environment from the harmful activities resulting from activities in the Area etc. as it is indicated in the Article 17(20(f) of Annex III of UNCLOS. In addition to this ISA has issued non-binding Regulations on Prospecting and Exploration for the Polymetallic Nodules in the Area¹⁷¹ that focuses on the precautionary principle while carrying out prospection in the Area while stating that “Prospecting shall not be undertaken if substantial evidence indicates the risk of serious harm to the marine environment”.¹⁷² The same principle is ensured in Regulation 31(2).¹⁷³ However, once again, ISA is only concerned with the protection of the marine environment

¹⁷⁰ United Nations General Assembly, 66th Session, Doc. A/66/119 of 30 June 2011, at p.5, para. 15

<<http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm>> accessed 19 June 2012

¹⁷¹ Adopted 13 July 2000, <<http://www.isa.org.jm/en/mcode>> accessed 30 September, 2012

¹⁷² Regulation 2(2) of the Regulations on Prospecting and Exploration for the Polymetallic Nodules in the Area. According to Regulation 1(3)(f) “‘serious harm to the marine environment’ means any effect from activities in the Area on the marine environment which represents a significant adverse change in the marine environment determined according to the rules, regulations and procedures adopted by the Authority on the basis of internationally recognized standards and practices”

¹⁷³ “In order to ensure effective protection for the marine environment from harmful effects which may arise from activities in the Area, the Authority and sponsoring States shall apply a precautionary approach, as reflected in Principle 15 of the Rio Declaration,10 to such activities.” Regulation 31(2) of the Regulations on Prospecting and Exploration for the Polymetallic Nodules in the Area.

including living resources when the harm can be caused from the activities in the Area over which ISA has the mandate on.

As the Director of the Office of Oceans Affairs of the U.S. Department of State, Margaret F Hayes remarks the reason why Part XI excludes applicability on living resources is conditioned either by the compromise to the fishing nations that were happy with the regime of the High Seas and would not like further complications by having different regime of the Area on parallel applicable to the living resources or that drafters just ignored existence of living resources in the deep seabed.¹⁷⁴ These arguments seem convincing as the first discovery about the existence of life into the deep-sea was made in 1864 by Norwegian researchers and already in 1872 British Government held global oceanographic investigations and has discovered thousands of new species of the living organisms.¹⁷⁵ This leads to the conclusion that during drafting of UNCLOS there was knowledge about the existence of deep-sea marine living resources, however it might also be true that the knowledge was so limited that nobody thought about their potential value for humanity.

According to Article 256 of UNCLOS all States have right to carry out MSR in the Area as long as it is in conformity with the Part XI of UNCLOS. On the other hand, the Article 143 (1) states that “[m]arine scientific research in the Area shall be carried out exclusively for peaceful purposes and for the benefit of mankind...” and according to Article 143 (2) ISA “shall promote and encourage marine scientific research in the Area,” so it is important to clarify whether or not the mandate of ISA extends to the bioprospecting on marine genetic resources into the deep seabed. Eventhough it is unclear of what kind of marine scientific research the Article talks about, supposedly it involves both types of research “pure” or “academic” and “applied” that is “research and the exploration for exploitation of natural resources”.¹⁷⁶ Furthermore, the Article 143 further states that ISA by itself can carry out prospecting on the Area and on its resources. The examples of the MSR projects carried out by ISA includes: Kaplan Project, which made it obvious that the deep-sea sediments can be reservoirs of the biodiversity and the mining activities might lead to the unpredictable consequences¹⁷⁷ and CenSeam Project, that helped ISA to consider minimizing risks of mining activities on deep-sea seamounts;¹⁷⁸ In

¹⁷⁴ Hayes (n 108) 688

¹⁷⁵ Deep Sea Exploration <<http://www.allthesea.com/Sea-Exploration.html>> accessed 22 May 2012

¹⁷⁶ Hayes (n 108) 692

¹⁷⁷ M Lodge, ‘Current Legal Developments International Seabed Authority’ 24 (2009) *The International Journal of marine and Coastal Law* 185, 189

¹⁷⁸ *ibid* 191

addition to this in 2006 ISA has established International Seabed Authority Endowment Fund for to encourage States get involved in Marine Scientific Research in the Area. The Fund became fully operational in 2007. However, can ISA encourage or get involved into the bioprospecting? The answer should be negative as the applicability of Part XI directly excludes living resources under its jurisdiction. Marine Scientific Research in the Area should be considered that is limited also to the seabed, ocean floor, subsoil thereof and the mineral resources of the Area that excludes MSR on living resources. Thus this is where the mandate of the ISA ends.

Although ISA has already done a considerable work in understanding of the marine biodiversity it has conducted MRS on the marine environment only to the extent to protect biodiversity from mining activities. Thus ISA's intention to get involved is limited to the interest in the mining activities and it is not in a position to control bioprospecting or exploitation of the deep-sea resources in general.

4.1.2 Freedom of the High Seas

As the current regime established under the Area is found inapplicable to the marine genetic resources, the question arises, whether they fall under the regime of the High Seas that is the second regime that is established by the UNCLOS and customary international law beyond the limits of national jurisdiction and is applicable to the water column only.

Among the six freedoms that are enjoyed on the High Seas there are freedom of fishing and freedom to carry out marine scientific research. Similarly, Article 257 of UNCLOS states that “[a]ll States ... and competent international organizations have the right ... to conduct marine scientific research in the water column beyond the limits of the exclusive economic zone.” Some of the States consider that marine genetic resources, being living organisms or their parts, are covered under the regime of the High Seas and that they are *res nullius* that means that there is a freedom to access to these resources and that whoever carries their exploitation becomes the owner of the resources. This view was widely supported by several delegations including from United States on the meeting of the Working Group, ensuring freedom on access to the marine genetic resources. However, it is important to note that States that support this idea should have plans to ensure sustainable use of marine genetic resources and protection of the endangered ones¹⁷⁹ and that the non-binding International Guidelines adopted by FAO which they propose as the only instrument

¹⁷⁹ Bass (n 40) 100

enough to be followed, cannot provide the sufficient regulation and protection.

According to the Article 76 of UNCLOS States can establish outer limits of their Continental Shelves beyond 200 nautical miles. Such an application should be submitted to the Commission on the Limits of the Continental Shelf. If all the requirements of the Article 76 are met the CS might be extended up to 350 nautical miles. However, it should be born in mind that the status of the super adjacent water does not change. In such a scenario it is interesting to examine what would be the status of the deep seabed living resources. They will fall under the regime of High Seas or will the regime of Continental Shelf on sedentary species apply. It is obvious that living resources that can fulfil the definition of the Article 77 (4) of UNCLOS will be classified as “sedentary species” of the Continental Shelf. There is an irony in the logic that the resources that in fact “belong” to the ocean floor, in the absence of the relevant regime, the regime of the high seas or in other words the regime governing living resources in the water column should be applicable.

Eventhough the regime of the High Seas is applicable to the living resources in general it becomes a complex issue whether or not deep-sea fish also falls under the regime. Especially if it will be taken into account that biological resources found into the deep-sea are closely connected and depended on the features of the seabed, they feed and live through chemosynthetic actions instead of photosynthesis. In other words they obtain food from the chemicals that are “found” on the seabed. In addition to this some of the living organisms are equivalent to the sedentary species of the Continental Shelf. This is where the issue gets more complex. In contrast to the regime of the Continental Shelf that is also applicable to the sedentary species and is defined under the Article 77 (4) as “organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or subsoil” in areas beyond national jurisdiction these type of living resources are not mentioned separately.¹⁸⁰ The Evolving concept of sedentary species falls under the regime of the Continental Shelf while the rest of the living resources within national jurisdiction are covered by the regime of EEZ. The fact that the same approach was not taken on the areas beyond national jurisdiction, leads to the first conclusion that this was either a compromise to the fishing nations or the knowledge about the living resources of deep seabed was so limited that drafters decided to be silent about them.

¹⁸⁰ There is also an opposition to this idea naming that it creates new challenges to distinguish sedentarily and non-sedentary species and define what the harvestable stage would mean for marine genetic resources. See Hayes (n 108) 689

Excluding applicability of the regime of the Area on living resources as discussed in the previous Chapter the question arises whether or not they can be considered as the living resources of the High Seas. Some of the industrialised States are of the view that MGRs are already covered by the regime of the HS. Which means that there is a freedom of access to all living resources. Those developed countries, including USA, reject the need of new regulations as they consider that any alteration of the current regime applicable to the MGR in areas beyond national jurisdiction will be breach of the freedoms of the HS.

Author thinks that besides the close dependence of the benthic organisms on the feature of the ocean floor answer on the above-mentioned question should be positive and that deep-sea marine genetic resources beyond the areas of national jurisdiction currently are covered by the regime of the HS. However, it should be taken into account that the provisions of the HS about the applicability to the living resources are mostly drafted for the fishing activities and thus are not adequate for the access to the MGR, which needs different approach to be taken.

There are several arguments named in favour of applicability of the regime of the Part VII of UNCLOS on MGR. First of all this regime would best guarantee intellectual property rights of the companies making new products from the new biological resources, which excludes obligation of sharing any benefits. In addition to this, they argue that regulation of the bioprospecting will prevent companies from making new discoveries.¹⁸¹

While understanding the importance of new discoveries and development in various industries where MGR can play a vital role the primer focus should be on the preservation of this organisms. Furthermore, so to say “sedentary species of the Area” together with the other deep-sea marine genetic resources are so connected to the ocean floor and the features on it, that author shares the view that application of the regime of the HS leads to an inequitable consequences.¹⁸²

¹⁸¹ Fayette (n 73) 261

¹⁸² Scovazzi, ‘Conservation and Sustainable Use of Marine Biodiversity’ (n 20) 12

4.2 Principles of Interational Environmental Law

As it was mentioned UNCLOS sets general principles on the protection of the environment that are blueprints to other international Conventions. In its Preamble the Convention recognize:

The desirability of establishing through this Convention, with due regard for the sovereignty of all States, a legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment.

Consequently, the question of protection of marine environment is regulated under the Part XII of UNCLOS. Although Part XII is mostly concerned with different sources of pollution, it also imposes general duties on States for the protection of the marine environment. Therefore Article 192 states that “States have the obligation to protect and preserve the marine environment.” This Article is too general however accepted by the significant number of States that are currently State Parties to UNCLOS. Similarly Article 193 requires States to observe the duty to protect and preserve the marine environment while engaged in the exploitation of their natural resources. For this regard Part XII encourages the cooperation and imposes duty of assistance among States by virtue of the Article 202 in scientific, educational, technical and other matters. These are the principles of UNCLOS that are applicable to the marine genetic resources; however the later needs detailed regulation and not the general principles of international environmental law that can be found in different Conventions. Such an example also could be Principle 21 of Stockholm Declaration¹⁸³ and Principle 2 of the Rio Declaration.¹⁸⁴ Both of the Principles declare the right of States to “exploit their own resources in a way to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond national jurisdiction.” This principle is based on the cases of *Trail Smelter* arbitration,¹⁸⁵ *Corfu Channel* case¹⁸⁶ and *Lake Lanoux* arbitration¹⁸⁷. It is note mentioning that in the Advisory Opinion of

¹⁸³ Stockholm Declaration of the United Nations Conference on the Human Environment (adopted 16 June 1972) UNTS

¹⁸⁴ Rio Declaration of the United Nations Conference on Environment and Development (adopted 14 June 1992) UNTS

¹⁸⁵ *Trail smelter case (United States, Canada)* 16 April 1938 and 11 March 1941, United Nations Reports on International Arbitral Awards Volume III pp. 1905-1982

¹⁸⁶ *Corfu Channel Case* judgment of December 15 1949, I.C.J. Reports 1949, p. 244

¹⁸⁷ *Lake Lanoux Arbitration (France v. Spain (1957))* 16 November 1957, United Nations Reports on International Arbitral Awards, Volume XII pp. 281-317

*Legality of Nuclear Weapons*¹⁸⁸ ICJ recognised that “the general obligation of States to ensure that the activities within their jurisdiction and control respect the environment of other States or of areas beyond national jurisdiction” is a fundamental principle of international environmental law. Although principle was adopted to concern interstate transboundary pollution and with regards to the areas beyond limits of national jurisdiction, it can be interpreted in a way to include restriction to any activities that could effect interest of the other States or International Community.

Similar general obligations can be found in other articles of UNCLOS. For instance Article 139 imposes obligation on the State parties to ensure that activities that they or their natural or judicial persons undertake in the Area should be in conformity with Part XI

Another principle that is ensured in Articles 204 -206 of UNCLOS relate to the need for a State Party to carry out environmental impact assessments when activities are carried out under their jurisdiction or control and may cause a significant harm to the marine environment.

Besides above mentioned general norms and principles, the CBD can also be applicable to the MGR beyond the areas of national jurisdiction to some extent. Although the applicability of the Convention is limited to the territory where Contracting States exercise their jurisdiction, according to the Article 4 of the Convention it also applies to the areas beyond the national jurisdiction but only with regards to the activities that are carried out under the control of Contracting States. Thus States can still enforce the norms of the Convention through *ratione personae*, (their nationals) and *ratione loci* (flag State jurisdiction).

To Conclude, together with the UNCLOS there are several other principles applicable to the protection of the marine environment and thus to the marine genetic resources. However, most of them are very general or specifically applicable to the certain fish stocks. There is no single instrument explicitly concerned with the subject. Existing instruments are disoriented, lack relationship between each-other and are administrated by different international organizations.

¹⁸⁸ *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J Reports 1996, p. 226, Para. 29

5 Possible Solutions

Although it can be argued that it is possible to find different Articles and principles under the current international legal framework that can be found applicable to the marine genetic resources, even though none of them directly mentions these resources, due to their general character, “multitude of global, regional and bilateral legally binding or non-legally binding instruments and acts by intergovernmental organizations”¹⁸⁹ and not being unified in one document it remains an issue of uncertainties and ambiguity. As Professor Erik Jaap Molenaar mentions, “[the system] is highly sectoralized and decentralized and suffers as a consequence not only from spatial and substantive gaps but also from actual and potential overlaps.”¹⁹⁰ It is inevitable that as long as there are no detailed and precise regulations of the certain subject, where the commercial interest of the States is involved the loopholes and the ways to avoid regulations are easier to be found.

Furthermore, it should be taken into account that deep-sea genetic resources that are located beyond the areas on national jurisdiction cannot be governed by the domestic laws of the States. So there is a need of regulation on an international level. That could be regional or global co-operation among States. It should be kept in mind that international treaty cannot impose any obligations on the third State.

In the absence of a unified system or hierarchy among the instruments applicable to the marine genetic resources there is a need for the adoption of a systematic approach. For the decades of meetings of delegations of different States by auspices of several international organizations various proposals have been made for resolving the problems associated with the marine genetic resources, most of which will be analysed below. From the first sight it seems that the regional approach to the subject would be more sufficient. In addition UNCLOS, when it comes to the protection of the marine environment, prioritizes the regional cooperation among States.¹⁹¹ However, as long as regional cooperation is the best solution for the protection of biodiversity within national jurisdictions it is difficult to use the same approach beyond limits of the States’ jurisdiction, especially where the commercial interest plays such a significant role. There is a need of having a major instrument that would be equivalent to UNCLOS or closely related to, in order to establish a global and unified regime for governing marine genetic resources of the deep-sea.

¹⁸⁹ Molenaar (n 6) 635

¹⁹⁰ *ibid* 635-36

¹⁹¹ See for example Articles 197-201

In the following Chapter the author will propose, some of the possible solutions to the problem. Examine the existing suggestions by the different delegations on the meetings of the Working Group and explore ideas of various international or non-governmental organizations and propose from her point of view the best possible way to solve the ambiguity and cover the legal gaps. It should be noted that the proposal of the author will require time, possible few years of negotiations to come into existence, however will be focused on a long-term and sustainable solution to the problem. Meanwhile, in order to decrease or eradicate the impact made by on-going bioprospecting activities into the deep-sea, the short-term solution would be that the General Assembly to adopt the Resolution in order to prohibit the exploitation or bioprospecting on the resources of the deep-sea that are vulnerable to such activities or would allow only “pure” marine scientific research until the regime is established. The analogous step has been taken by the General Assembly in 1969, when it adopted the Resolution 2574¹⁹², where it was declared that until the new regime for the seabed and the ocean floor would have been established “[s]tates and persons, physical or judicial, are bound to refrain from all activities of exploitation of the resources of the area of the seabed and ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction.”

5.1 Revision of UNCLOS

UNCLOS contains provisions on procedures for its amendments, namely it includes three types of amendments. According to Article 312 a State Party has a right to address Secretary-General of the United Nations with the amendment proposal. After the circulation of the proposal among the State parties, if at least half of the member States during the 12 month-period agree on the proposal the conference is to be arranged by the UNSG. Decision making procedure at the conference will be the same as it was during UNCLOS III.

Second way to amend the Convention is ensured in Article 313. The method specified in this Article is simpler than the previous one. The procedure for the proposal is exactly the same, however no conference need to be carried

¹⁹² United Nations General Assembly, 24th Session, Resolution 2574 - D of 15 December 1969, Question of the reservation exclusively for peaceful purposes of the seabed and the ocean floor, and the subsoil thereof, underlying the high seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind, <<http://www.un.org/Depts/dhl/resguide/r24.htm>> accessed 11 June 2012

However, it should be mentioned here that the Resolution could be adopted only because developing countries, so called “Group 77” voted for it, whereas Western countries not only voted against but also after its adoption argued that they are not bound by the Resolution. Cassese (n 152) 383

out since even if one of the Member State objects the amendment within 12 month the proposal is considered to be rejected and the vice versa.

Amendments related to the activities in the Area, including Annex VI section 4 require special procedure that is regulated under the Article 314. Which States that the proposal is to be made by a State and sent to the Secretary-General of the Authority. The proposal should be approved by the Council and afterwards by the Assembly.¹⁹³

The idea of “opening” UNCLOS for amendments exist among some scholars and is often opposed by others. The author would agree that revision of UNCLOS can be one of the solutions in order to eradicate the ambiguities among the subject and that it is acceptable since the issue will be regulated under the main treaty of the law of the sea.

From the given options it should be stated that the amendment procedure proposed by the Article 314 is irrelevant for the subject concerned since besides the fact that the amendment would include activities conducted in the Area such as MSR, bioprospecting. This amendment procedure includes only any amendments related to activities in the Area with regards to the minerals of the Area. The simplified amendment procedure should also be excluded as even a single objection will stop the amendment procedure and as it was shown several States at the meeting of the Working Group states that no new regulations needed to be adopted.

The only procedure that can be used is the general amendment procedure drafted in the Article 313. However it is often fairly argued that it might lead to the revision of the Articles not only related to the marine genetic resources but most probably will involve certain other issues and will result in the long-time debates until the conclusion can be reached. Consequently, in the situation where there is a need to act immediately to impose restrictions on the bioprospecting that is frequently undertaken another 15-year negotiations would not be the best solution. Besides this, there is a fear that the compromises that have been made during UNCLOS III will be addressed again and might not lead to the agreement and cause more complications.

¹⁹³ See Article 314 of UNCLOS

5.2 Soft Law

One of the options among the proposals to protect marine biological diversity in general and marine genetic resources in particular beyond the areas of national jurisdiction is considered to be involvement of FAO. FAO already has a Code of Conduct for Responsible Fisheries 1995, that could have been annexed to the existing Code of Conduct concerning management of deep-sea fisheries in the High Seas.¹⁹⁴ Neither this proposal is left without objections. As Professor Fayette remarks “fishing and bioprospecting are completely different kinds of activities.”¹⁹⁵ Furthermore some of the States think that non-binding instruments such as Codes of Conduct by FAO cannot be sufficient regulation and protection.¹⁹⁶ Especially when the financial interests of the States are so high. It could serve as an instrument providing guidelines only for the States willing to follow and implement them into their national jurisdictions. Besides, the instrument should be directly addressing the MGR and the specific activities related to them.

Impressive work has been done by the scientists drafting the InterRidge Code of Conduct concerning hydrothermal vent. Their guidelines that are focusing on the precautionary principle and encourage co-operation¹⁹⁷ could also be used in general while carrying out marine scientific research.

There are several other interesting Guidelines adopted by different organizations, just to name Code of Conduct for Responsible Marine Research in the Deep Seas and High Seas of the OSPAR Maritime Area adopted in 2008, which is basically based on InterRidge Guidelines however with the limited scope of applicability.

Soft law can be useful instrument to assist States in implementation of the certain regulations as in case of the CBD and the Bonn Guidelines, or can serve as a guideline to certain activities but will only be effective as far as the States would be committed to implement them under their domestic legislation. Their violation does not bring any international responsibility thus cannot be trusted that will be followed.

¹⁹⁴ International Guidelines for the Management of Deep-sea Fisheries in the High Seas, 29th August 2008, FAO

¹⁹⁵ *ibid*

¹⁹⁶ Molenaar (n 6) 649

¹⁹⁷ For more information see < <http://www.interridge.org/IRStatement>>

5.3 Adoption of the New Legal Instrument

As it has already been mentioned whereas in areas within national jurisdiction most of the relevant solution would be to focus on the protection of marine genetic resources on regional level, for the protection of the marine genetic resources beyond the areas of national jurisdiction the main focus should be on adoption of a new legally binding instrument that would unify the system of protection. Unified rules and standards are necessary at least to some extent especially when consideration is given to the areas beyond national jurisdiction that is the concern of the whole mankind.

A new legal instrument may establish new international organization or extend the functions of already existing one. The opinions of the scholars differ among this subject. Some consider that extension mandate of already existing international body will be more resourceful and practical than establishment of new international organization that will be associated with more expenses, time and complications with a possibility of overlapping its mandate over ISA.¹⁹⁸ Some of them think that such an organization could well be the Committee on Fisheries of FAO, the United Nations General Assembly or the Trusteeship Council,¹⁹⁹ there are also discussions about the extension of the mandate of the ISA²⁰⁰ etc. Supporters of the idea of the extension of the mandate of the ISA argue that it already exists and is involved in MSR and since it already has a jurisdiction to some activities in the Area right to access to the MGR could also become the part of its mandate.²⁰¹ Author thinks that extension of the any of the existing international institutions will need major reconstructions and would lead to no less expenses, time or complications. In fact ISA seems to be the most possible choice, however it will be discussed later why establishment of

¹⁹⁸ See Leary, 'Bioprospecting and the Genetic Resources' (n 7) 156

¹⁹⁹ P. Sands, *Principles of International Environmental Law* (Cambridge, Cambridge University Press, 2nd edition, 2003) 94 cited in Molenaar (n 6) 650;

In 1990 President Gorbachov of the Soviet Union proposed that Trusteeship Council could extend its mandate and "include responsibility for environmental protection in areas beyond national jurisdiction, the global commons." In addition to this the similar proposal was made by Malta, to change the function of the Council in a way to include the protector of the resources of the global commons under its responsibilities. Reported by S Busuttill and K Yazaki, "Preface" in A Agius and S Busuttill with T Kim and K Yazaki (eds) *Future Generations and International Law* (London, Earthscan Publication: 1998) at p. xi cited in Molenaar (n 6) 650

This would require amendments to the UN Charter and reconstruction of the Council.

It should be also noted that UN Trusteeship Council suspended operation on 1st of November 1994, Trusteeship Council <<http://www.un.org/en/mainbodies/trusteeship/>> accessed 19 June 2012

²⁰⁰ Leary, 'Bioprospecting and the Genetic Resources' (n 7) 156

²⁰¹ Fayette (n 73) 259

new governing body should prevail over extension of the mandate of the ISA from author's point of view.

Under the Article 237 (2) of UNCLOS it is stated that any Convention that is concerned with the protection and preservation of the marine environment should be in conformity with the general principles and objectives of UNCLOS. Adoption of a new independent treaty seems to be an option to solve the problem but it might well cause the overlap between different regimes of the Conventions. Although legal gap exists only with regards to the deep seabed living resources, new regulations would preferably cover under the same regime all the living resources, including those that currently fall under the regime of the High Seas established by UNCLOS.

Besides this, there are already a number of international conventions establishing general requirements for the protection of the marine environment, however does not seem to be effective for the number of State Parties and lack of implementation those Conventions into the domestic legislation. With this unsystematic number of regulations once again there is a need to focus on a unified regime rather than the adoption of a new independent treaty with the limited applicability.

Author thinks that regulation of marine genetic resources should become part of the UNCLOS, as the widely accepted global instrument would be more promising for the protection of the vulnerable ecosystems beyond the areas of national jurisdiction and will focus on the ocean space as a whole. Thus from the very beginning the author excludes establishment of new international organization or extension of the mandate of any of the international organization that is not covered by UNCLOS.

Since the revision of the UNCLOS as a whole has been excluded for the reasons mentioned above, the best possible ways for "changes" into the UNCLOS would be adoption of a new implementation agreement to the Convention that would be limited to the subject concerned.

5.3.1 Adoption of the New Implementation Agreement to UNCLOS

5.3.1.1 General Overview

As Kojima states Implementation Agreement often is an option to address issues need to be regulated by a treaty of a universal character when the procedure of the modification of that treaty is not preferential.²⁰²

To what constitutes implementation agreement there is no precise answer to that however the practice distinguishes two types: one that is adopted in order to address specific region or specific topic, such an agreement can exist independently from the original treaty however it might underline the connection with the original Convention.²⁰³ The second one is an integral part of the original treaty and is adopted for the reasons of giving more clarification to the general rules and terms used in the original treaty; in order to modernise the treaty or in order to add the missing regulative mechanisms to the original treaty.²⁰⁴ The example can be Agreement relating to the Implementation of Part XI of UNCLOS. Similarly to the Straddling Fish Stock Agreement author is of the view that states can become parties to the new implementation agreement without becoming parties to UNCLOS. Thus giving the new implementation agreement more independence and availability to be applied by more nations without taking further responsibilities within their national jurisdictions. However the close connection between the new implementation agreement and UNCLOS will be explicitly emphasised.

Another Implementation Agreement that the author suggests that need to be adopted will be part of UNCLOS, orientating on general principles of international environmental law. Modifying certain provisions of UNCLOS and referring to other relevant Conventions applicable to the MGR, such as for instance the CBD, by exactly stating the superiority among the Conventions. The Agreement will define all the relevant terms that are not defined in any legal instrument or are inadequate, such as MGR, bioprospecting etc. The States will be further encouraged to co-operate with each other and conclude other regional agreements in conformity with the principles of UNCLOS and its Implementation Agreements.

²⁰² Chie Kojima, "Implementation Agreements", (Heidelberg and Oxford University Press 2009) *Max Planck Encyclopedia of Public International Law* 5

²⁰³ *ibid* 1

²⁰⁴ *ibid*

Thus the new Implementation Agreement, similarly to UNCLOS serve as a blue print for other Conventions, elaborating just general principles of international environmental law exclusively orientated on MGR of deep-sea. However, with a detailed regulation of the activities carried out in the deep-sea for the searching of the valuable organisms.

5.3.1.2 Scope of Applicability of the New Implementation Agreement

The purpose of a new implementation agreement would be to cover the issues relating to the marine genetic resources that are either not regulated by UNCLOS or arise some uncertainties. In other words, it shall clarify the applicable regime to the deep-sea marine genetic resources, define and regulate bioprospecting, ensure access to and the benefit sharing, but at the same time take into account the fundamental principles of international law, such as principle of sustainable development of the resources and the precautionary principle. Thus the main focus should be on the protection of the marine environment.

Although the paper is not addressing all the MGR but is limited to the deep-sea MGR it should be mentioned that the division between ocean floor and super adjacent water when it comes to the living resources should not play a major role any more. New Implementation Agreement might create a new zone vertically and address only deep-sea living resources i.e. bellow 200 m or also address free-flowing fish in the whole water column in terms of access to the genetic resources.

The proposal of the adoption of the New Implementation Agreement to the UNCLOS is supported by the European Union. That argues that the objective of the Agreement should be: “conservation and management of marine biological diversity, including the establishment, on an integrated, scientific and precautionary basis, of marine protected areas in areas beyond national jurisdiction.”²⁰⁵ Establishment of the MPAs can also be one of the main objectives of the new Implementation Agreement, however the main point is that it should establish stricter rules on exploitation of living

²⁰⁵ Statement by Austria, on behalf of the EU at the 7th Meeting of the Informal Consultative Process (2006) in Molenaar (n 6) 639-40; See also United Nations General Assembly, Report of the Working Group 61st Session, Doc. A/61/65 of 20 March 2006 at p. 8, Para 25, <<http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm>> assessed 21 May 2012

See also Serge Beslier, “The Protection and Sustainable Exploitation of Genetic Resources of the High Seas from the European Union’s Perspective” (2009) 24 *The International Journal of Marine and Coastal Law*, 333, 336

resources and marine scientific research than it is currently under the regime of the High Seas with a specific attention to the bioprospecting and conservation of the marine genetic resources derived from all marine living organisms, including “sedentary species”, found beyond the areas of national jurisdiction.

Critics that often arise against this proposal is conditioned by the claims of some of the States that argue that drafting of any new instrument including new Implementation Agreement to UNCLOS will be “complex and time consuming.”²⁰⁶ The author realizes that it will take time to adopt the text of the treaty and agree on the new terms but this is the best solution out of possibilities to start to act. It will take less time that the revision of UNCLOS would have and is more advantageous compare to the adoption of a totally new independent International Convention, since the regulations will stay within the framework of UNCLOS and will eradicate possibilities of overlapping on the same subject and contradiction. Furthermore, as the Preamble of UNCLOS states, “the problems of the ocean space are closely interrelated and need to be considered as a whole”. So in order to take into account the already established principles of the regime beyond the areas on national jurisdiction that are High Seas and the Area, the new regime should be internal part of the same Convention, establishing and regulating the aforesaid areas. Besides this, it is impossible to focus only on the deep seabed resources, where there is a real vacuum of the legislation, and ignore other deep-sea or high sea resources in the water column. As Kemal justly observes, “in reality the seabed has no independent existence”.²⁰⁷ Of course States are not restricted but if fact encouraged to continue regional cooperation and involve parts of the areas beyond national jurisdiction for a new regulations as far as this is allowed under UNCLOS. The example could be Article 120 of UNCLOS that allows States or international organizations to establish stricter regulations or prohibit the exploitation of marine mammals than it is established by the Convention. However, regional co-operation solely would not lead to the sustainable protection. When the economical importance of the genetic resources will be confirmed more and more companies will get involved in the conservation of these organisms. They will avoid any restrictions adopted by regional States as no obligations can be imposed on the third State. Thus, they States might refer to the freedoms of the High Seas to get involved into conservation of the marine genetic resources.

²⁰⁶ United Nations General Assembly, Report of the Working Group 61st Session, Doc. A/61/65 of 20 March 2006 at p. 15, para. 55 <<http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm>> accessed 21 May 2012

²⁰⁷ Baslar (n 152) 234

Two options that arise by the adoption of a new implementation Agreement are: expansion of the mandate of the International Seabed Authority or establishment of a new international body. Author is of an opinion that the regime on marine genetic resources should not share the same principles, as they are applicable to the mineral resources. Thus in order to avoid confusion and disorientation within the ISA it will be an advanced option if new organization have a mandate over the regulation of the issue of marine genetic resources. Besides, ISA has been designed for the mineral resources of the Area, so the structure and the functions of the organisation is not relevant and will anyways need a major reconstruction. Opposition of the idea of expansion of the mandate of ISA often is based on the composition of ISA Council. Half of 36 Member States represent major consumers and exporters of minerals of the deep seabed.²⁰⁸ Furthermore, ISA is often criticised because of its difficulty to involve large number of States into the discussions and to make them send their delegation in Kingston, Jamaica.²⁰⁹

In addition to this, also from practical purposes the establishment of a international body under UNCLOS will be more successful than expansion of the mandate of the ISA, which is very busy with dealing with its tasks and might not like to be involved in more complicated issues. Furthermore, this proposal lacks support from the member States of the ISA including Canada.²¹⁰

The opposition about the establishment of a governing regime on the areas beyond national jurisdiction and on regulation of access to the marine genetic resources arises from the developed States that would not like to be restricted on access to the resources and be subject of licensing and following bureaucracy on international level. However, it should be noted that the protection of biodiversity is a critical issue and unless there are regulations in place on international level and States are responsible to an international institution to follow certain requirements, “self-restrictions” cannot be an option. This will result in dying out of more and more species that will lead to the ecological catastrophe. As Mr. Basler fairly mentions fish stock can no longer be considered as inexhaustible as it was in Grotian times due to the development of the fishing technology and opportunity to exploit further big amounts of fish stock.²¹¹ This is more correct when more

²⁰⁸ König (n 3) 160

²⁰⁹ Tullio Treves, ‘The Development of the Law of the sea since the Adoption of the UN Convention on the Law of the Sea: Achievements and Challenges for the Future’ in Davor Vidas (ed), *Law, technology and Science for Oceans in Globalisation, IUU Fishing, Oil Pollution, Bioprospecting, Outer Continental Shelf* (Martinus Nijhoff Publishers, Leiden, Boston 2012) 41, 45

²¹⁰ Leary, ‘Bioprospecting and the Genetic Resources’ (n 7) 162

²¹¹ Baslar (n 152) 231

vulnerable deep-sea resources are concerned that are late in maternity and low in reproduction.

5.3.1.3 Fundamental Principles of the New Implementation Agreement

It is important to focus on what will be the fundamental principles of the regime that should be applicable to the marine genetic resources. It is proposed that the principles should have more in common with the regime of the common heritage of mankind. Although Pardo's proposal to include living resources as well under the regime of the CHM was rejected at that time as being unrealistic,²¹² this does not mean that States will share the same opinion now. To the question of why future regime for marine genetic resources should share most of the principles of the CHM, the answer is very simple and also conditioned with the many reasons. First of all the regime of the CHM had a good practice in terms of protection of the marine environment and thus with the slight modifications most of its principles should also be extended to the living resources located beyond the areas of national jurisdiction in general. As Professor Taylor states CHM policy was successful when the environmental law matters were concerned because it involved the notion of "common interest".²¹³

Secondly, the principles of CHM mostly apply to the non-renewable resources, such as polymetallic nodules of the Area or minerals of the Moon. Eventhough marine genetic resources are renewable resources, as it has already been mentioned they are slow in reproduction and thus can be similar to the exhaustible resources in a sense of availability. Furthermore, regime of the CHM is usually applied to the resources that are "utmost importance to the scientific community and by extension, to the mankind."²¹⁴ The importance of the marine genetic resources to the scientists and the society is not doubtful as they might lead to the new discoveries into the science field, development of biotechnology and be sources of new drugs and thus benefit the mankind. There is even theory of how life began on earth that is associated with the ocean and today there is an assumption that all could have started from the inhabitants of hydrothermal vents in early Archaean period about 4 000 million years ago.²¹⁵ Finally, CHM is often applied to the resources that are not accessible

²¹² Tuerk (n 152) 34

²¹³ Prue Taylor, *An Ecological Approach to International Law, Responding to the Challenges of Climate Change* (London & New York: Routledge, 1998) cited in Erkki Holmila, 'Common Heritage of Mankind in the Law of the Sea' (2005) *ACTA SOCIETATIS MARTENSIS* 187, 193

²¹⁴ Holmila (n 211) 194

²¹⁵ Scovazzi, 'Conservation and Sustainable Use of Marine Biodiversity' (n 20) 7

on equal bases by everybody due to the advanced technological needs. And this is a fair attitude to prevent monopoly of the technologically equipped States over the resources. The technology needed to carry out MSR on marine genetic resources is also limited to the developed countries such as the USA Australia, New Zealand, Germany, and other EU countries, Russia, and Japan.

In addition, *de lege ferenda* applicable to the marine genetic resources will not be exactly similar to that of the minerals of the Area but will share parts of them, incorporating other principles of international environmental law. Furthermore, the new regime would not apply to the fishing activities, in other words would not effect the freedom of fishing in to the High Seas for the food consumption purposes. However, this does not restrict States to incorporate certain regulations on fishing activities on HS in order to preserve the biodiversity and ensure their sustainable development or include MGR found in the free-swimming mega fauna under the New Implementation Agreement, with respecting the freedoms of the High Seas. As this is beyond the scope of the paper author will not address further their issue.

In fact CHM has been proposed by Pardo as a concept through which he saw the future extension of the regime to all the recourses as the best way for “sustainable management of mankind’s heritage.”²¹⁶ Today, having these principles in place for the whole living resources is more important and particularly for the marine genetic resources.

The name of the new regime is not of much significance. The important thing is what the principles that it will incorporate are. Nevertheless, the new regime can also be called CHM since there is no strict definition for the concept and as Holmila fairly mentions “it is always a matter of choice ... a matter of agenda what is included in the definition of the CHM.”²¹⁷ Pardo has expressed similar ideas, after making his statement. He argued that type of application of the CHM depends on the needs, wants and interests of the developed and developing States in each case.²¹⁸ That is the approach that will be developed by the author for the new regime.

First of all living resources that are not subject on national jurisdiction should be “concern of the whole mankind”. This means that all States no matter party on non-party to the Agreement should observe the fundamental

²¹⁶ UN Chronicle, “Law of the Sea Convention: Ten Years Later” March 1993, 87 cited in Baslar (n 152) 236

²¹⁷ Holmila (n 211) 195 See also Scot J Shackelford ‘The Tragedy of the Common Heritage of Mankind’, (2008) 27 *Stanford Environmental Law Journal*, 101

²¹⁸ Shackelford (n 215) 104

principles of international law and the Agreement in order to preserve marine biodiversity.

Secondly, MGR beyond the areas of national jurisdiction will belong to the mankind as a whole but access to it will be subject of the licenses need to be obtained from the international organization by submitting all the relevant information that should include assessment of the environmental impact of the activities. Same requirement is also an obligatory when mining activities are to be carried out.²¹⁹ International organization will act as a “Government” under its jurisdiction to which States or judicial or physical persons are responsible for obeying certain procedure in order to access and carry out bioprospecting activities on marine genetic resources. It should be mentioned here as well that eventhough bioprospecting is covered by UNCLOS, the detailed definition of the term should also be provided.

Next and the third principle should be ensuring of equitable benefit-sharing. To what should constitute the “benefit-sharing” the Convention on Biological Diversity will be a great assist. In general benefits can be monetary and non-monetary advantages. The later may include fair and effective participation of any State, especially developing States, in scientific research as well as sharing of the results and any outcomes of the research.²²⁰ Such benefit-sharing is also ensured by the Article 143 (3) of the UNCLOS according to which the cooperation between States in marine scientific research on Area and its resources should be promoted by participating in international programmes, transferring results of the research and analyses. Such right is also provided in the Article 244 of the Convention where the developing States are prioritized in receiving knowledge resulting from MSR, as well as the education and training of the technical and scientific personnel. Moreover, Article 144 of UNCLOS requires States to transfer technology to the developing States. Although this requirement has been modified by the Implementation Agreement of Part XI with merely encouraging States to cooperate, this Article can be an example for the new Implementation Agreement with regards to the transfer of technology requirement for bioprospecting on marine genetic research in order to ensure that innovations contribute to the whole world and the future generation rather than improving welfare of only industrialized States.

²¹⁹ Section 1 (7) of Annex to the Implementation Agreement of Part XI, See also Regulation 32 (6) of Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July, 2000); However in the Advisory Opinion in 2011 Seabed Dispute Chamber stated that obligations of the States in terms of the environmental impact assessment goes beyond the requirements specified in the Regulations. See Case N17, Advisory Opinion on Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, ITLOS, 1 February 2011, 150

²²⁰ See Articles 15 and 19 of the CBD

When it comes to the sharing of monetary benefits, things get complex here than in case of polymetallic nodules. Sharing of monetary benefits from the utilization of the marine genetic resources located beyond the areas of national jurisdiction is on the one hand complicated and on the other hand almost impossible process as it is difficult to estimate what were the costs for the marketable products. Does it include proceeding sampling of other materials to calculate actual benefits of the company or not. Noting that even ISA has not come up with the methodology to share monetary benefits from minerals in the Area.²²¹ Furthermore, in case of marine genetic resources it is not the resources that are so valuable but the final products that might take years to be proved that are successful.²²² The author thinks that due to this reasons and actual impossibility to share monetary benefits such revenue-sharing should not be part of the new regime. Besides, monetary benefit-sharing was understandable since engaging of the new States in the exploitation of the minerals of the Area might have decreased prices on the same resources on the market and would have effected States, already distributing such resources. Whereas, in case of marine genetic resources, the concern is more on the development of the science and making new discoveries without effecting any State's interests.

Benefit-sharing, including monetary benefits, arising out of the utilization of the marine genetic resources is key issue when it comes to such resources located within the areas of national jurisdiction as besides the environmental concern it is important to interest source countries in preserving and making expenses on protection of the biological resources. Such interest is mostly associated with the financial gain. Good example can be steps taken by the Government of Nova Scotia.²²³ Such threat would not arise when the resources are "common concern of the mankind" and are administrated on international level by international organization which has no interest into the resources but merely serves as a "guardian".

Finally, the objective of the new Implementation Agreement should be a sustainable use of the resources, which is the major element of the sustainable development. The need that the development should be sustainable becomes more and more important nowadays and any field should pay more attention to it. Unofficial definition of the sustainable

²²¹ During UNCLOS III the idea about calculation of the monetary benefits was to distribute 50 per cent per capita if the exploited material was distributed before from maximum 40 poorest States and the involvement of new distributors would effect them. Later the idea was developed to contribute maximum 300 million USD annually to the ISA that would share it to the poor countries that GNP per capita would be under 250 USD. Baslar (n 152) 217-18

²²² Tuerk (n 152) 48

²²³ See page 29 of the paper

development was provided by the World Commission on Environment and Development that states: “Sustainable development is a development that meets the needs of present without compromising the ability of future generations to meet their own needs.”²²⁴ As it was expressed in the judgment of *Hungary v. Slovakia*, sustainable development is the new norm and standard that comprises “economic development with protection of the environment.”²²⁵

Another one of the important principles through which the new Implementation Agreement should act is the precautionary principle. In other words, when there is the lack of scientific information States should restrict themselves from the activities that might be harmful to the environment. Especially when the information about the deep-sea environment is so limited. Precautionary principle was the basis also of the order on the *Southern Bluefin Tuna Cases*, where International Tribunal for the Law of the Sea stated that “the parties should ... act with prudence and caution to ensure that effective conservation measures are taken to prevent harm to the stock of southern Bluefin tuna.”²²⁶ This principle is also ensured on Principle 15 of the Rio Declaration, which states:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

This is how the exploitation of the natural resources, including genetic resources, should be carried out. This will be possible if the principles discussed above will be realized. Transfer of information and technology, access to the results and outcomes of the research will avoid undue expenses of the resources. This is what the major focus should be on, prioritizing protection of the marine environment, its flora and fauna over intellectual property rights.

Furthermore in the situation where there are still big flows in the understanding of the marine environment and lack of knowledge on the processes undergoing into the deep-sea there is a need of constantly carrying

²²⁴ Brundtland Commission’s Report, World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 43 cited in Daniel Barstow Magraw, Lisa D Hawke, ‘Sustainable Development’, in Daniel Bodansky, Jutta Brunnée, Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2007) 613, 618

²²⁵ *GabCikovo-Nagymaros Project (Hungary/Slovakia)*, Judgment, 1. C. J. Reports 1997, p. 7, at p. 75 para. 140

²²⁶ *Case N 3 and 4, Southern Bluefin Tuna Cases*, (New Zealand v. Japan; Australia v. Japan), Requests for provisional measures, Order, at para. 77

out studies and MSRs. Thus author agrees with Doris König that obligatory requirement of the environmental impact assessment should also be part of the new regime.²²⁷ Environmental Impact assessments should be always take place prior to the activities that are to be carried out in the marine environment. The perfect example of how the assessments should be held could be the procedures and regulations drafted in the Protocol on Environmental Protection to the Antarctic Treaty.²²⁸ The protocol distinguishes two types of impact assessments. If the activity is supposed to have less than a minor or transitory impact Initial Environmental Evaluation is to be carried out as it is defined in Article 2 of the Protocol and include a brief description of the activity, location, duration etc. According to the Protocol Comprehensive Environmental Evaluation is to be carried out when the activity may cause more than minor or transitory impact. Such an assessment requires much detailed information to be provided in advance.²²⁹

New regime should share the principles of the CBD and its Protocols as well, as long as it will be in conformity with the principles established by UNCLOS and customary international Law.

There are also certain technical details that should be addressed in a new Implementation Agreement. First of all it should provide definition of the marine genetic resources that should be equivalent to the definition of genetic resources provided in the CBD but exclusively addressing marine living organisms. In addition to this New Implementation Agreement should define and regulate in detail bioprospecting. Provide exactly what kind of activities does it include and how should they be conducted, also define its starting and ending stage. Particular attention should also be paid to the technology used so that they will not be harmful for the environment. According on the information available it should be made sure that the activities will not cause pollution of any kind, including noise or light pollution and minimize the possibility of introduction alien species to the ecosystem. In other words new Implementation Agreement should require contracting States to use Best Available Techniques (BAT) and Best Environmental Practice (BEP).

²²⁷ König (n 3) 148

²²⁸ The Protocol on Environmental Protection to the Antarctic Treaty (Antarctic-Environmental Protocol) (adopted on October 4, 1991, entered into force January 14 1998)

²²⁹ See Article 4 of the 1991 Protocol

See also Harlen Cohen, "Some Reflections on Bioprospecting in the Polar Regions" in Davor Vidas (ed), *Law, technology and Science for Oceans in Globalisation, IUU Fishing, Oil Pollution, Bioprospecting, Outer Continental Shelf* (Martinus Nijhoff Publishers, Leiden, Boston 2012) 339, 347-348

5.3.1.4 New Forum

New international organization that will be established by the implementation agreement will serve as a forum where the delegations of the State Parties and the expertise will have the possibility to get together and discuss on going processes in terms of the bioprospecting and conservation activities on the MGR. Analyse the impacts of the activities carried out in the ABNJ and the current situation of the marine environment and biodiversity.

New international organization will also ensure adequate access to the MGR and the observation of the principles of UNCLOS and its Implementation Agreements by the requirement of the licences. As Professor Fayette mentions, organisms found on different sites need different treatments and specific approaches.²³⁰ This is one of the reasons why the existence of the governing body is required, that will ensure that possible environmental impacts have been evaluated and adequate precautionary measures have been observed among other requirements.

New forum will serve also in the elaboration of Codes of Conduct for the entities engaged in the bioprospecting and exploitation of the marine biodiversity. It will ensure that activities concerning MGR beyond the areas beyond the national jurisdiction are carried out in environmentally sound ways.

5.3.2 Adoption of the New Protocol to the CBD

Although the author from the very beginning based on the reasons mentioned above excluded regulation of MGR through the international Convention other than UNCLOS it is important to mention the proposal of adoption of the new Protocol to the CBD that is also widely supported by States and experts.

The proposal of the Adoption of the new Protocol to the CBD is supported by the Greece and Seychelles States thinking that CBD should be the instrument dealing with the marine genetic resources located beyond the areas of national jurisdiction however this idea is opposed by several other countries such as: Brazil, Argentina, Colombia, Peru and several others.²³¹

²³⁰ Fayette (n 73) 265

²³¹ Earth Negotiations Bulletin, Summary of the Eight session of the Subsidiary Body on Scientific, Technical and technological Advice of the Convention on Biological Diversity

As it was discussed the scope of application of the CBD according to the Article 4 of the Convention extends to the areas within the national jurisdiction of States and beyond the limits of national jurisdiction only with regards to the activities of the nationals of the contracting Parties. To clarify, contracting States can ensure that activities of their nationals or the vessels flying their flag are in consistence to the CBD only through enforcement of their domestic law. No other State will have a right being party to the CBD enforce its law under non-national. This very much limits the application and satisfactory regulation of the Convention. Besides the CBD is “based on the national sovereignty”.²³² In other words access to the genetic resources and benefit-sharing is subject to the agreement of the providing and user States.²³³ Whereas in the areas beyond national jurisdiction there is no State to contract with. As Doris König fairly mentions in order to make it right in ABNJ there will arise a need of establishment of a new international organization.²³⁴ While author shares the view that there is an urgent need of existence of the governing body in ABNJ and as it was already proposed to be established through the new implementation agreement to UNCLOS, such organization acting under the mandate of the CBD will not be a solution.

The flaws of such a proposal lays in the following: First, of all as according to the Article 22 of the CBD and 311 (3) of UNCLOS in case of the conflict UNCLOS will prevail, any new regulations and new regime established by the new Protocol of the CBD that will be inconsistent with UNCLOS will not work for its State Parties. Secondly, for such a major changes there is a need that the issue is left under the direct “control” of the UNGA that with its influence will ensure proper implementation and observance of the new provisions.

10-14 March 2003, 9 (252) *Earth Negotiations Bulletin* cited in Leary, ‘Bioprospecting and the Genetic Resources’ (n 7) 162

²³² König, (n 3) 158

²³³ *ibid*

²³⁴ *ibid*

6 Conclusion

In the situation where the deep-sea ecosystems are under the threat of degradation because of different impacts, such as marine pollution, tourism, shipping, global warming and the increasing number of bioprospecting and exploitation of the inhabitants, it is urgent that the International Community will adopt strict regulations such as restrictions from any activities that would result in a serious harm to the deep-sea resources.

MGR of the deep sea within the national jurisdiction of the States does not face problems of a great nature and does not need deep interference into their regulations since the ways of exercising sovereign rights over them falls under the full discretion of States themselves. Besides, there already exist sufficient number of Conventions and Codes to serve as guidelines for States. However, as it was stated the focus should be on further implementation of such legal instruments and this should happen by stricter reporting system by the governing bodies of the Conventions and not only. Also through raising awareness among States of the protection of the vulnerable resources.

When it comes to the ABNJ as it was shown MGR are left almost unregulated. Some general principles are applicable, however does not provide much of help with their broad nature. MGR, being living resources was considered to fall under the regime of the HS currently however, with no regulations to the activities that are carried out concerning such resources and neither with adequate protection. The paper addressed several possible solutions came to the conclusion that the short term solution to the problem would be adoption of the Resolution by the United Nations General Assembly allowing only “pure” MSR and no further exploitation for a certain period of time until relevant information is gathered and the sophisticated regulations are adopted. Whereas in the long run, as it was mentioned, international community should think of adoption of unified system by the virtue of the new legal instrument under the authorized body to deal with the protection of the marine genetic resources.

Implementation Agreement to UNCLOS has been prioritised by the author among other possible solutions for different reasons. First of all, UNCLOS, claiming that is a global Convention regulating all aspects of the ocean space should justify its status and fill up the missing gaps. Secondly, the issue was partly already addressed by UNCLOS but provided not sufficient protection and the changes should have been made in the same Convention that would avoid overlapping and contradiction among different legal

instruments. Thirdly, such an important issue should be left under the authority of the General Assembly, which would be the only organ that can encourage the implementation of the new instrument under the domestic legislations of the States.

Furthermore as Chie Kojima states “the creation of an implementation agreement of this kind has proved successful when a treaty regulates community interests and when there are significant changes in circumstances over time through the development of technology or through political and economic changes.”²³⁵

A new Implementation Agreement, imposing certain liabilities to the non-party States could only be operative if it is part of the UNCLOS and administered by the General Assembly due to the authority of the both institutions.

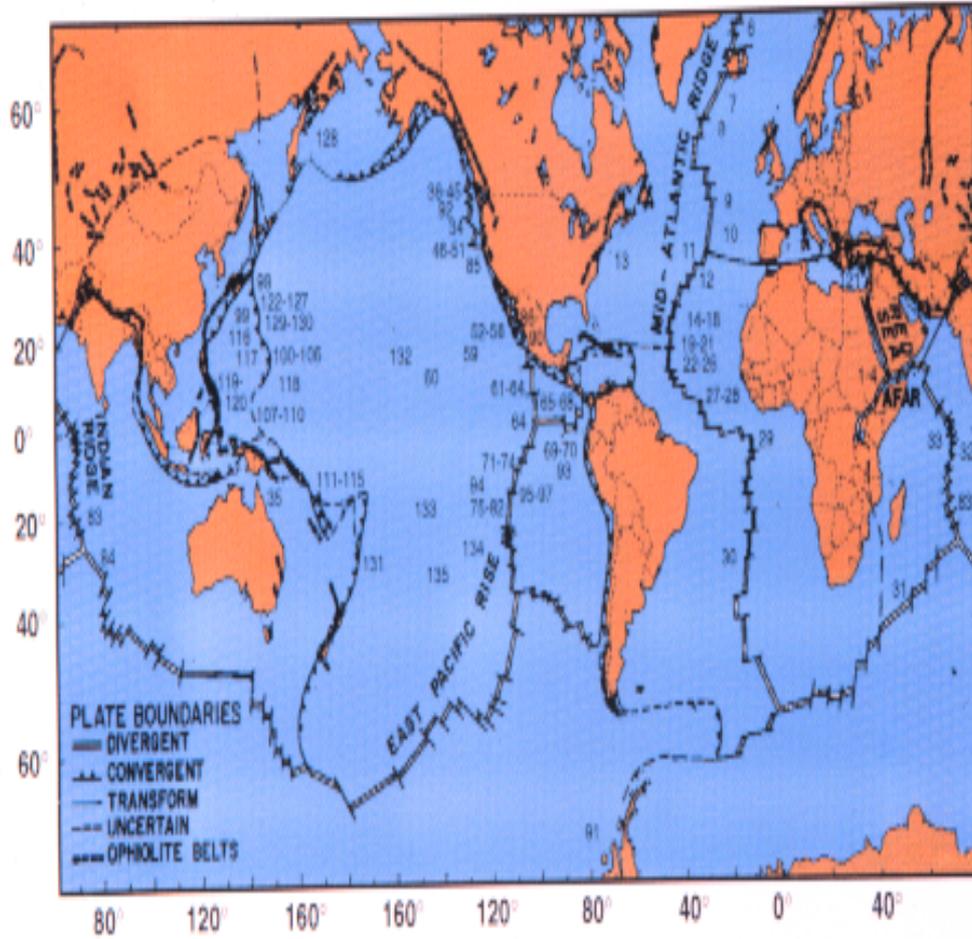
New Implementation Agreement will not only define terms and eradicate ambiguity but also establish new international organization that would act with respect to the UNCLOS together with its Implementation Agreements and International Principles. It will stand as a guardian of the marine environment, its flora and fauna, focusing on ecosystem approach by carrying out environmental impact assessment of the future bioprospecting activities and basing its decisions on the precautionary principle whereas at the same time encouraging MSR and ensuring benefit-sharing among the States with the particular attention to the developing States and finally advancing use of marine genetic resources in a way to ensure sustainable development.

Finally, it should be mentioned that often decisions of these kind are very much depended on a political will rather than other matter. However, looking at the state-practice author stays optimistic as they always sanded together after all when the major changes needed to be made with respect to the environmental protection.

²³⁵ Kojima (n 202) 5

Supplement A

GLOBAL SEAFLOOR HYDROTHERMAL SITES



Map from Peter A. Rona and Steven D. Scott, Preface: Seafloor Hydrothermal Mineralization: New Perspectives, *Economic Geology*, Special Issue, December 1993 (No. 8)

Supplement B

IUCN Category	Definition	Primary Objective
Ia	Category Ia are strictly protected areas set aside to protect to protect biodiversity and also possibly geological/ geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.	To conserve regionally, nationally or globally outstanding ecosystems, species (occurrences or aggregations) and/ or geodiversity features: these attributes will have been formed mostly or entirely by non-human forces and will be degraded or destroyed when subjected to all but very light human impact.
Ib	Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition	To protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate, so that current and future generations have the opportunity to experience such areas.
II	Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities .	To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation.
III	Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine caverns, geological feature such as a caves or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.	To protect specific outstanding natural features and their associated biodiversity and habitats.
IV	Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.	To maintain, conserve and restore species and habitats.

IUCN Category	Definition	Primary Objective
V	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.	To protect and sustain important landscapes/seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices.
VI	Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in natural condition, where a proportion is under sustainable natural resource management and where low-level non industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.	To protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.

source: Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas (supplementary to the 2008 Guidelines) Second Draft: June 2011

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