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Access and Benefit Sharing: Issues related to Marine Genetic Resources

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Abstract: Since the entry into force of the CBD in 1993, countries have struggled to find answers to several questions related to ABS issues and have spent considerable amounts of time, energy and money in understanding how to operationalise these principles. One critical area that is beginning to appear during the discussions under the international regime is the status of marine genetic resources with a particular emphasis emerging on genetic resources available in areas beyond national jurisdiction. This paper presents some key legal and policy issues that negotiators of the international regime on ABS need to consider in relation to marine genetic resources.

Keywords: CBD, ABS, Marine, Genetic Resoruces.

Introduction

One of the key innovations of the UN Convention on Biological Diversity (CBD) was the way it sets out key principles relating to Access and Benefit Sharing (ABS) in relation to genetic resources. For example, Article 15 of the CBD on Access to Genetic Resources states that each Contracting Party shall endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties. Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources. Each Contracting Party shall endeavor to develop and carry out scientific research based on genetic resources provided by other

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Contracting Parties with the full participation of such Contracting Parties. Moreover, each Contracting Party is required to take legislative, administrative or policy measures with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources.[1]

At the same time, it is also one of the most contentious aspects of the Convention because of limited experience of countries in dealing with ABS besides ABS discussions spanning social, economic and cultural arenas. Since the entry into force of the CBD in 1993, countries have struggled to find answers to several questions related to ABS issues and have spent considerable amounts of time, energy and money in understanding how to address these questions. Though more than six years were spent on developing a voluntary set of guidelines on ABS (the Bonn Guidelines) in 2002 countries quickly moved on to the development of an 'international regime' on ABS with limited focus on implementing/using the Bonn Guidelines. In 2006 Parties to the CBD decided that they will have to complete negotiations for the international regime by 2010. However, this process of defining the nature, scope, objective and elements of the regime seems to be taking longer than expected.

One critical area that is beginning to emerge during the discussions under the international regime is the status of marine genetic resources with a particular emphasis emerging on genetic resources available in areas beyond national jurisdiction. This paper presents some key legal and policy issues that negotiators of the international regime on ABS need to consider in relation to marine genetic resources. The intention on the paper is not to provide a prescriptive idea for the negotiations, but provide an information compilation which may provide useful to negotiators to consider when finalizing the international regime on sectoral issues such as marine genetic resources and links to other multilateral negotiation processes.

Marine Genetic Resources

In recent years the question of the status of genetic resources of marine areas both within and beyond national jurisdiction has been a subject of debate in the forums associated with the Convention on Biological Diversity, the International Seabed Authority, the United Nations Informal Consultative Process on the Law of the Sea, the annual debates

of the United Nations General Assembly on Oceans and the Law of the Sea, and more recently, in the deliberations of 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. Discussions in these forums has focused on three main issues pertaining to both areas within and beyond national jurisdiction: access and benefit sharing in relation to marine genetic resources; the establishment of marine protected areas (MPAs); and the regulation of mineral prospecting operations at hydrothermal vents sites and, more generally, of environmental impacts of human activities in open and deep ocean areas[2]. In addressing questions associated with access and benefit sharing in relation to marine genetic resources the international community should be mindful of the consequences for integrated oceans governance of failing to recognize the linkages between those issues.[3]

Marine Prospecting

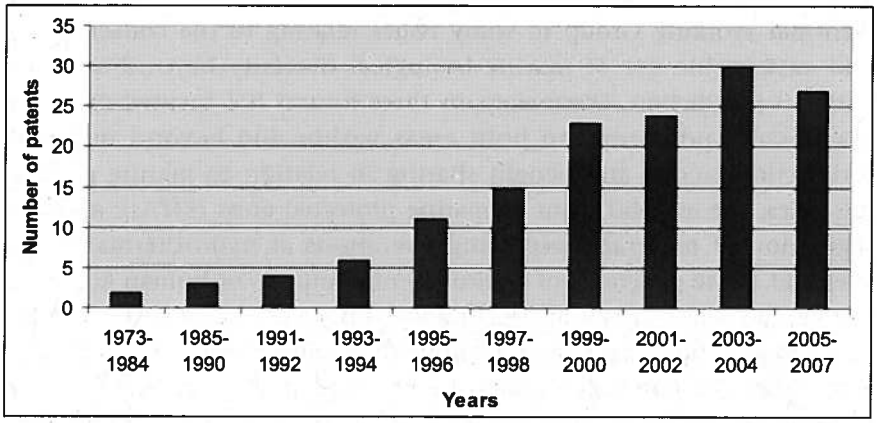
While there is a considerable divergence of views within the international community as to the precise meaning of the term "bioprospecting", at least in the context of marine genetic resources the term "bioprospecting" is more accurately defined as including the entire research and development process from sample extraction by public scientific and academic research institutions (which are generally but not exclusively funded by governments), through to full scale commercialization and marketing by commercial interests such as biotechnology companies.[4]

The focus of research on marine genetic resources is gradually becoming broader and also encompasses deep sea genetic resources as well as genetic resources from other areas beyond national jurisdiction such as Antarctica. According to a recently published study[5] at least 135 patents relevant to marine genetic resources were filed in the period from 1973 to 2007 (see Figure 1 below). The search undertaken for the purposes of that study was conducted using simple key words including the terms 'marine genetic resources' and should therefore be considered as purely indicative.

The patents identified in that study were classified according to categories reflecting six domains of application: chemistry, pharmacology, cosmetics, food, agriculture and health care.

Actual patenting activity is probably much greater than that limited search suggests. For example a subsequent study published in 2008 identified

Figure 1: Number of Patents involving Marine Genetic Resources filed from 1973-2007



Source: Vierros et. al 2007.

at least 20 patent and or patent applications based on or derived from marine sources in the Arctic alone.[6] These patents fell into seven broad categories of potential or actual use including medicines or pharmaceuticals, animal health care products (including aquaculture), food technology, enzymes with industrial applications, enzymes with life science research application, cosmetics and skin care, and nutraceuticals (including dietary supplements and other health products.[7]

It is very difficult to clearly quantify the monetary value of marine biotechnology due to the lack of clear global data.[8] Although there have been a number of studies on the commercial value of marine biotechnology, it is difficult to accurately place a figure on the commercial value of marine biotechnology due to variations in assessment methodologies.[9] Some studies have attempted to give a global view of the marine biotechnology industry. For example, one recent study estimated that in 2004 marine biotechnology globally was valued at 2.2 billion excluding aquaculture, seaweed and processing related industries (Douglas-Westwood Limited 2005). Other studies have focused on specific market values of industries commonly using marine genetic resources and approximate annual sales of selected marine-based products.[10] One cancer-fighting agent alone sourced from marine sources is estimated to have annual sales of US$1 billion in 2005.[11] Another recent study estimates that in 2002, global sales of marine biotechnology products, including anti-cancer compounds, antibiotics and antivirals, were estimated at about US$2.4 billion.[12]

Despite all of these studies there has so far been no single authoritative valuation of the marine genetic resources and their commercial uses and there is little if any clear data on the commercial use of marine genetic resources sourced from marine areas beyond national jurisdiction. Unlike the debate surrounding climate change there has so far been no "Stern Review" for the oceans and marine genetic resources in particular. Moreover, an eventual monetary valuation of marine genetic resources should take into account the values of the services of deep sea ecosystems.[13] Such a review is long overdue.

Legal Issues Concerning the Commercial Use of Marine Genetic Resources

Marine genetic resources found within areas of national jurisdiction are to be accessed and used according to the relevant provisions of the 1982 Law of the Sea Convention (LOSC), the CBD and other relevant international agreements. The LOSC does not provide a definition of the term 'marine areas beyond national jurisdiction', but it is generally accepted that the term 'marine areas beyond national jurisdiction' refers to the two discrete jurisdictional zones referred to in the LOSC known as the 'High Seas' and the 'Area'. Following the provisions of Article 86 of the LOSC the 'High Seas' may be regarded as all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State. The 'Area' is defined in Article 1(1) of the LOSC as "the sea-bed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction". Uncertainty exists as to the extent of coastal State jurisdiction over marine genetic resources on the continental shelf beyond the Exclusive Economic Zone (EEZ). This uncertainty relates primarily to the sovereign rights of the coastal state over the so called sedentary species under LOSC. But as this subsidiary issue has received little attention in the international debate so far this question is not addressed in this paper (for further examination of this issue see publications such as (Allen 2001), (Korn et. al 2003) and (Leary 2007)). For the purposes of this paper the term 'marine areas beyond national jurisdiction' may be regarded as referring to all parts of the sea that are not included in the EEZ, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State including the water column and the Area.

It is worth noting that in marine areas beyond national jurisdiction two separate legal regimes apply to the 'High Seas' and the 'Area'. As a matter of customary international law and under the LOSC it is generally accepted that marine genetic resources are freely accessible to all, that is to say access to and the sampling of marine genetic resources in the High Seas is regarded as a legitimate exercise of freedom of the High Seas. In that regard it is worth noting that the list of High Seas freedoms listed in Article 87(1) of the LOSC are not exhaustive and for present purposes it is worth noting that "freedom of the high seas" includes, "*inter alia*" "freedom of navigation", "freedom of scientific research" and "freedom of fishing".

The position with respect to the 'Area' is more complex. It is generally accepted that access and benefit sharing in relation to the genetic resources of the Area is unregulated. Such activities fall outside the operation of the main international legal regime applicable to the deep sea established by Part XI of the LOSC and the 1994 Implementation Agreement in relation to Part XI of LOSC (the Part XI Agreement).[14] These treaties established a very detailed international regime governing exploitation and benefit sharing in relation to the mineral resources of the Area. Principally this regime vests the International Seabed Authority with a mandate to regulate the exploitation of the mineral resources of the 'Area'.

However, the genetic resources of the deep sea do not fall within the 'resources' to which that regime applies.[15] This is because the definition of 'resources' contained in Article 133(a) of LOSC limits the International Seabed Authority's mandate to "all solid liquid or gaseous mineral resources in situ in the Area at or beneath the sea-bed, including polymetallic nodules". As such the International Seabed Authority only has a mandate to regulate exploitation of those mineral resources. Its mandate does not extent to the genetic resources of the 'Area'. However, the International Seabed Authority has recently expressed a desire to address issues associated with the sustainable management of deep sea biodiversity to the limited extent that its mandate allows (principally with respect to mining).

There has been some debate in various international forums as to whether deep sea genetic resources and or marine genetic resources more generally in areas beyond national jurisdiction should be regarded as the common heritage of mankind [sic], as that term is used in LOSC. In the case of marine genetic resources in the High Seas it is unlikely that this is correct as this is inconsistent with such resources being subject to High Seas freedoms.

In the case of the genetic resources of the Area the common heritage of mankind [sic] status of genetic resources as distinct from deep sea mineral resources is disputed. Regardless of whether or not these resources are regarded as or subsequently designated as the common heritage of mankind or not, this still does not address the core issue of the absence of regulation of access and benefit sharing in relation to these resources in areas beyond national jurisdiction. Even if marine genetic resources were regarded as the common heritage of mankind there is still no mechanism provided for in LOSC to regulate access and benefit sharing in relation to these resources.[16]

It is also worth noting that certain marine species found in the Area possess pelagic larval life stages, which implies that, for a certain period of their life cycle, these resources are to be found in the water column. Issues related to different stages of the life cycles of marine genetic resources (which may be pelagic or benthic, depending on the species in question) are currently not adequately reflected in the international discussions on these resources.

Perhaps even more significant than the debate as to the applicability or otherwise of the concept of the common heritage of mankind is the role played by patents in the exploitation of marine genetic resources. The grant of a patent in relation to development of biotechnology from marine genetic resources is the key legal act in the bioprospecting process.[17] Unlike other resources of the ocean such as minerals or fish, in the case of marine genetic resources often one small sample can be developed into a new product, while in some areas of research often the final commercialized product is based on a derivative and no subsequent sampling of the original organism is required. This is not always the case though, as some research on certain new drugs requires harvesting of large quantities of the marine organisms. Ultimately only the person who holds the patent on the new product developed can lawfully exploit that product or license others to exploit the product. Thus even if a third party could obtain another sample and reproduce the initial biotechnological product, that third party's ability to exploit that product would be subject to the patent rights held by the first party to patent the product.[18]

Importantly, it is worth noting that the grant of a patent is essentially a sovereign act of a nation State, albeit to an extent subject to international treaties such as the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the

Purposes of Patent Procedure (the Budapest Treaty).[19] This is especially significant in the case of biotechnology derived from genetic resources sourced beyond national jurisdiction because regardless of where the original genetic resource is sourced, the grant of a patent is always something that occurs within a State's jurisdiction. This means that the rights of a patent holder are determined by the domestic law of the State in which the patent was granted (subject to that State's international legal obligations including obligations under TRIPS and the Budapest Treaty). Thus rights in relation to patents (as opposed to the question of access rights) are not affected by the absence of a specific regulatory regime in areas beyond national jurisdiction.[20]

Key Issues that the International Community Needs to Address with Respect to Genetic Resources from Areas beyond National Jurisdiction

The core issue of course is whether or not benefits associated with exploitation of marine genetic resources should be shared by the entire international community, not just by the wealthy developed states with the capacity to exploit such resources, which remain difficult to access, technologically and financially.[21] Once the international community reaches a consensus with respect to the need for access and benefit sharing to be regulated then arguably the single most important step will be to link that regime to international and domestic regimes dealing with the grant of patents with respect to marine genetic resources.[22]

One author has proposed that this might be achieved with minimal change to the existing patent system.[23] This proposal suggests that benefit sharing in relation to such resources might be achieved by means of royalties payable in relation to patents granted in relation to deep sea and other marine genetic resources sourced from areas beyond the limits of national jurisdiction. Thus it has been suggested that this could be achieved by establishing a form of trust fund with royalties to be made payable to that trust fund. The payment of royalties could be made a condition of the grant of the patent which would be imposed under domestic law. In addition to existing disclosure requirements, those depositing microbes in type culture collections under the Budapest Treaty might also be required to identify the exact geographical location of where the microbe is sourced thus making it possible to identify whether or not the proposed benefit sharing regime applies.[24] Much of the scientific literature reviewed for the purposes of this and previous

studies have contained information on the location where the original samples were taken from, often identifying precise co-ordinates of latitude and longitude. Although this is not always the case.

It is important to note that the proposal noted above would only extend to genetic resources sourced from areas beyond national jurisdiction as those within national jurisdiction already fall within the regime recognized by the CBD. A few parameters for the proposed royalty have also been suggested and should also be noted. Firstly it has been suggested that a good benchmark figure may be similar amounts paid under access and benefit sharing arrangements within national jurisdiction.[25] Secondly it has been suggested that it would be preferable that any such royalty be linked to the actual sale of products derived from such genetic resources. This would minimize the royalty becoming a disincentive to research and development.[26]

Questions also need to be considered in relation to the environmental impact of activities such as marine scientific research which provide the samples for research and development. It is not yet clear whether the scale of the environmental impact of such activities warrants regulation. Clearly further detailed scientific research on the nature and scale of such activities is required.[27] Before any regime is imposed to regulate the environmental impact of marine scientific research, if in fact such a regime is warranted in the first place, it is important that there is close examination of the impact of such a regime on scientific research. Ill conceived and hasty regulation runs the risk of setting back very valuable scientific research.[28] At a minimum, as earlier studies have noted (eg (Vierros et. al 2007) and (Leary 2007)) any regime must be developed in consultation with the scientific community who are both stakeholders and advisors to policy makers.

However, as evidence is emerging that marine scientific research does have some environmental impact (especially at sites that are repeatedly visited) a precautionary approach would mandate that the international community consider seriously the nature and scale of its impact, and the extent to which regulation is warranted.[29] There are precedents for the sustainable management of the environmental impact of science beyond national jurisdiction. The most obvious example is the mechanisms of the Madrid Protocol to the Antarctic Treaty which is primarily implemented via domestic legislation of contracting parties. The Madrid Protocol is a suitable model for regulating the environmental impact of scientific research in areas beyond national jurisdiction

including the deep sea.[30] Compliance with an environmental impact assessment mechanism modelled on the Madrid Protocol might be enhanced if compliance with any such regime was made a condition of receiving government funding for scientific research as already occurs in several jurisdictions.[31] Such an environmental impact assessment regime might also be incorporated into regimes for the management of MPAs in areas beyond national jurisdiction.[32]

Issues under CBD

The other main treaty of relevance to these issues is the CBD. However, the CBD appears to have only a limited application to activities in areas beyond national jurisdiction. In a meaningful practical sense the CBD would only appear to apply to activities beyond national jurisdiction to the extent that States regulate the activities of their own nationals. So far no State regulates the activities of its nationals with respect to the genetic resources in areas beyond national jurisdiction.[33]

Under Article 4, the jurisdictional scope of the CBD is limited to components of biodiversity found in areas within the limits of national jurisdiction. Deep seabed and other marine genetic resources in areas beyond national jurisdiction are therefore excluded from the CBD's scope. However, the CBD applies to processes and activities, regardless of where their effects occur, carried out under the jurisdiction or control of states within or beyond areas subject to national jurisdiction. As observed by Arico and Salpin (2005) "it follows that activities undertaken in the High Seas or the Area, including navigation, scientific research, bioprospecting, exploration, exploitation dumping and tourism, fall within the scope of CBD if they are carried out under the control or jurisdiction of a CBD Party".

As Arico and Salpin (2005) go on to observe

> "Under Article 22, the CBD does not affect the rights and obligations of Parties deriving from existing international agreements, except where the exercise of those rights and obligations would cause serious damage or threats to biodiversity. Since the exploitation of marine genetic resources in areas beyond national jurisdiction including those of the seabed implies value-addition, several articles of CBD could provide a basis for States to regulate bioprospecting activities of their own nationals in relation to such resources. These articles include Articles:

- 8 (d) on protection of ecosystems and species, *in situ*
- 9 (d) on the regulation and management of collection of resources
- (c) on the identification and monitoring of processes which have or likely to have significant adverse impact
- 8 (l) on the management and regulation of processes and activities having significant adverse impacts and
- 14 (a) and (c) on environmental impact assessments and exchange of information regarding activities having significant adverse impacts.

These provisions provide a basis for development of impact assessment guidelines, technical standards, monitoring activities and setting thresholds for collection and use of marine genetic resources".[34]

According to Arico and Salpin (2005) a study carried out analyzing CBD Decision II/10, was presented at the 8th meeting of the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA) of the CBD in March 2003. It outlined relevant provisions of the CBD and UNCLOS, and concluded that

> "neither the United Nations Convention on the Law of the Sea nor the Convention on Biological Diversity provides a specific legal regime for commercially-oriented activities relating to marine genetic resources on the High Seas and in the Area," and stressed the need to develop a legal regime to regulate them. A similarity between the objectives pursued by the international community both under UNCLOS and the CBD was noted, since both instruments aim at the conservation of marine biodiversity and attempt to ensure sustainable use of its components. The study stressed that while the CBD further aims at a fair and equitable sharing of the benefits arising out of the use of genetic resources, UNCLOS aims at an equitable sharing of benefits arising out of mineral resources from the Area. The following options to address bioprospecting for deep seabed genetic resources were examined: maintaining the *status quo* and leaving the exploitation of deep seabed genetic resources unregulated; applying the regime of the Area and its resources to deep seabed genetic resources, which would entail the application of the common heritage of humankind principle to deep

> seabed genetic resources as well as their management by an international body for the benefit of all, and amending the CBD to bring deep seabed genetic resources within its framework." (Arico and Salpin 2005).

However, Parties to the CBD were divided on how to address the issue of marine genetic resources beyond national jurisdiction since SBSTTA 8. COP 7 of CBD through its Decision VII/5 called for rapid action to address threats to marine biodiversity in areas beyond national jurisdiction, including in relevant international fora such as the UN General Assembly. Establishment of Marine Protected Areas beyond national jurisdiction was also called for with cooperation from all relevant international agencies and processes.[35]

In relation to deep seabed genetic resources beyond the limits of national jurisdiction, decision VIII/21 of the COP notes the biodiversity value of deep seabed genetic resources (VIII/21 paragraph 1) and recognizes the urgent need to enhance scientific research and cooperation on deep seabed genetic resources and to provide for their conservation and sustainable use (VIII/2 paragraph 2). The COP decision also emphasizes the urgent need for capacity building in developing countries relating to deep seabed biodiversity (VIII/21 paragraph 9).

Discussions under the Working Group on Access and Benefit Sharing are to cover issues of need for transparency in exchange of genetic resources and call for disclosure of origin of genetic resources in applications for intellectual property rights. Currently CBD, UNCLOS as well as other intergovernmental processes are unclear on how to address these issues.

Several studies concluded that any meaningful benefit sharing regime on deep seabed genetic resources can be effected only if such resources are brought under a regime similar to that governing the mineral resources of the Area under UNCLOS. Such an approach reflects the view taken by the G77 on the issue more than any of the other views expressed by non G77 States and other stakeholders to date. But as noted elsewhere in this paper this is by no means the only possible option for addressing the issue. The maintenance of a firm attachment to such an approach may make it very difficult for a clear resolution of the issue to be achieved. Perhaps a more flexible approach is warranted. The debate should perhaps focus on what is the best way to achieve an equitable distribution of benefits associated with bioprospecting in marine areas beyond national jurisdiction rather

than automatically jumping to the conclusion that there is but one solution to the issue.

In addition to the other models mentioned above lessons can also be learned from other regional instruments focusing on protection and use of marine environments including the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) that includes focus on cooperation and protection of marine environments of the High Seas and underlying seabed and sub-soil with provision of measure for protection of species and habitats; the Noumea Convention (Convention for the Protection of the Natural Resources and Environment of the South Pacific Region) that covers seabed activities; the Mediterranean Action Plan that includes maritime areas in the High Seas, beyond the national jurisdiction of the 22 Parties to the Barcelona Convention for the protection of the marine environment and the coastal region of the Mediterranean; the Antarctic Treaty System (ATS) that includes the Antarctic Treaty, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Madrid Protocol and the Convention on Regulation of Antarctic Mineral Resources Activities (CRAMRA), and the Intergovernmental Oceanographic Commission of UNESCO.[36]

In addition several non-governmental initiatives such as the InterRidge Initiative that facilitates international and multi-disciplinary research associated with mid-ocean ridges, and the Micro-Organisms Sustainable Use and Access Regulation International Code of Conduct (MOSAICC) have contributions to make to defining the ABS provisions for marine genetic resources in areas beyond national jurisdiction.[37] National activities and experience such as Canada's Endeavour Marine Protected Area, the Lucky Strike and Menez Gwen Marine Protected Area of Portugal etc. also provide some examples of national interventions to deal with issues of access to marine genetic resources with limited focus on benefit sharing.[38]

Recent Developments Relevant to Deep Sea Genetic Resources, including ABS

At a recently-held Strategic Planning Workshop on Global Ocean Issues in Marine Areas Beyond National Jurisdiction in the Context of Climate Change (Nice, France, January 23-25, 2008) held under the auspices of the Global Forum on Oceans, Coasts, and Islands and with the co-sponsorship of the Nippon Foundation, it was stressed that

"[w]hile there has been substantial progress in recent years in achieving integrated governance of oceans in areas under national jurisdiction and in regional seas areas, governance of areas beyond national jurisdiction remains largely sectorally-based, fragmented, and inadequate. This means that it is difficult to address inter-connected issues (such as the impacts of human uses on the environment, multiple-use conflicts among users, and responses to climate change effects) through an integrated and ecosystem-based approach. There are, moreover, significant differences of opinion among stakeholders regarding what actions need to be taken to improve governance in marine areas beyond national jurisdiction, especially regarding the question of distribution of benefits from the uses of biodiversity in these ocean areas" (Global Forum 2008a).[39]

At the Nice Workshop, there were discussions about the usefulness of examining modes of benefit sharing which had been developed in other areas so as to inform future debates in the context of relevant fora, namely, the UN Working Group and the CBD. This was based on the consideration that providing an overview of the range of modes of benefit sharing represented a key step in the work of the Global Forum on improving governance of marine areas beyond national jurisdiction.

At the 4th Conference on Oceans, Coasts and Islands organized by the Global Forum (Hanoi, 7-11 April 2008), a number of such possible ABS models and tools were considered so as to further discussions on deep sea genetic resources. These models include: the IOC Abe-LOS Criteria and Guidelines on Transfer of Marine Technology; the ABS-Management Tool developed by the International Institute for Sustainable Development; The World Intellectual Property Organization contracts database; the CBD ABS case studies; the UNU-IAS Information Resources on Biological Prospecting; the OECD study on Valuation and Exploitation of Intellectual Property; the OECD study on Research Use of Patentable Knowledge: A Review; and the Call of the Earth Llamado de la Tierra and UNU-IAS publication on Pacific Genes and Life Patents, Pacific Experiences and Analysis of the Commodification and Ownership of Life – among others.[40]

At the Hanoi Conference, the Co-chairs of the Global Forum Working Group on Governance of Marine Ecosystems and Uses in Areas Beyond the Limits of National Jurisdiction produced a report for consideration by the UN Working Group at its second meeting (New

York, 28 April – 2 May 2008). The report refers to current discussions in relation to access to genetic resources in areas beyond national jurisdiction and their potential for applications such as pharmaceuticals and industrial processes, as well as with regard to the sharing of the benefits arising from their utilization. The report suggests that these discussions should continue in an appropriate forum. In particular, the United Nations General Assembly *Ad Hoc* Open-ended Informal Working Group should be institutionalized as a regular mechanism that provides the forum to pursue discussions and make recommendations on issues related to marine biodiversity in areas beyond national jurisdiction, including the equitable and efficient utilization as well as the conservation of on marine genetic resources. Access and benefit-sharing, as well as capacity-building, should also be an important element of these discussions, and appropriate models of trusts that would operate on the basis of users' rights should be identified.[41]

Although moderate in length and scope, the discussions on genetic resources at the second meeting of the UN Working Group (New York, 28 April-2 May 2008) largely confirmed the directions of work suggested by the Global Forum WorkingGroup.

Future Options for ABS Discussions related to Marine Biodiversity

Given the need to conserve marine biodiversity, sustainably use the resources and share benefits of such use, it is important to understand the nature of the problem and this can only be achieved with further detailed study of these issues. While the CBD, UNCLOS, UNGA, ATS and others deal with issues of marine biodiversity they have so far had limited progress in linking up with each other to address issues of conservation, use and access issues for marine genetic resources. Political and administrative divisions continue to exist within each of these processes which in part appear to fail to consider a forward-looking agenda for sustainable use and ABS issues related to marine biodiversity. It is therefore important to consider the following as possible related questions or issues that need to be considered for discussion under all the above fora:

1. Discussions under CBD, UNCLOS and the related international forums need to be based on clear understanding of legal and compliance issues as well as national capacities to implement the

provisions. As such further studies are required on the capacity of all states on this issue.

2. Bioprospecting in marine environments is an emerging area of research for many countries. Environmental impacts of such actions are poorly assessed. Quantitative data and evidence to show the optimal levels of harvesting marine genetic resources is either lacking or purely anecdotal. In the absence of development of assessment tools on short and long term impacts of sourcing marine biodiversity it will be difficult for countries to assess the potential use of marine biodiversity for bioprospecting purposes. The biodiversity impact assessment and environmental impact assessment tools developed under the CBD may need to be extended for application and use in marine environments. A first step towards this goal might be a detailed study of the potential and actual impacts of bioprospecting in marine areas beyond national jurisdiction and their connections if any with other extractive uses of ocean resources.
3. Though several studies have indicated the growing commercial interests of using marine biodiversity, the economic potential of marine biological resources is yet to be ascertained. Valuation of marine biodiversity is therefore needed in order to assess the size of commercial and related markets for these resources. Simply put now is the time for a "Stern Review" for the Oceans.
4. Discussions under the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable utilisation of marine biological resources beyond areas of national jurisdiction established by the UN General Assembly need to consider linkages with discussions under the CBD on development of an international regime on ABS. There have been some initial studies on possible options for ABS but there is limited analysis of such options. Scientific cooperation and technology transfer form the core of such options.[42] These should be discussed in light of the commercial interests and confidentiality terms associated with use of marine biodiversity for commercial purposes.
5. A critical issue relating to benefit sharing is the interaction of any benefit sharing regime with national and international patent systems. A detailed study of how existing patent regimes interact with other relevant sources of law and policy is required. A second aspect of such a study should consider possible modalities for

interaction between patent regimes and each of the possible options for benefit sharing.

6. The nature and scale of partnerships between industry and scientific research institutions is unclear. Again what information that is available is largely anecdotal. A detailed study on the nature and extent of these partnerships, together with a study of the legal arrangements and modalities of operation of existing partnerships would help inform on-going debate on this issue, especially having regard to the close link between so called pure [sic] marine scientific research and bioprospecting.
7. Discussions both within UN and outside need to address the need for establishing an institution or process or modify an existing institution or process with a mandate to adopt conservation measures, authorise and receive access requests (if closer examination of possible options suggest this is desirable), and possibly negotiate benefit sharing arrangements, deal with technology transfer and information exchange and feed into various national, regional and international fora.

The need for such institutions or processes will however very much be determined by what form of regulation if any the international community deems desirable. There should not be regulation just for regulations sake, but instead future consideration of options should be focussed on the desired outcomes which in turn will point the way to suitable options. It is absolutely fundamental to the success of any future regime that it is outcomes focussed and is not to bureaucratic. The last thing we need is for a future ABS regime for marine areas beyond national jurisdiction to effectively put a brake on future scientific and commercial advances. Most importantly any future regime must be built on the key pillars of sustainable use and conservation of biodiversity that underlie the CBD. These principles are fundamental to the future of marine biodiversity in areas beyond national jurisdiction for present and future generations.

Conclusions

Issues identified and discussed in this paper are a clear result of limited and sometimes conflicting interests of international negotiation processes. Some of the issues that are emerging seem to stem from the advances made in scientific and technological fields that necessitate global and regional agreements to be responsive to such changing and emerging needs of countries and institutions.

It is of critical importance that international negotiations under various institutions should be based on on-the-ground realities in terms of governance options, capacities of stakeholders involved, resources and timelines available to effect change and decision making based on a holistic understanding of the issues rather than sectoral opinions. It is hoped that all the stakeholders who are either parties to the discussions or who will be affected by the decisions will understand the inter-linkages on the main dimensions of ABS identified in this paper when making decisions and drawing up protocols and action plans to conserve, sustainably use and share the benefits of genetic resources both within and beyond areas of national jurisdiction.

Endnotes

1 Article 16 on Access to and Transfer of Technology states that each Contracting Party undertakes subject to the provisions of the Article to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment. Access to and transfer of technology to developing countries shall be provided and/or facilitated under fair and most favorable terms, including on concessional and preferential terms where mutually agreed. In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. Each Contracting Party shall take legislative, administrative or policy measures with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights, where necessary, through relevant CBD provisions (Articles 20 and 21) and in accordance with international law. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology for the benefit of both governmental institutions and the private sector of developing countries. Article 19 on Handling of Biotechnology and Distribution of its Benefits states that each Contracting Party shall take legislative, administrative or policy measures, as appropriate, to provide for the effective participation in biotechnological research activities by those Contracting Parties, especially developing countries, which provide the genetic resources for such research, and where feasible in such Contracting Parties. Each Contracting Party shall take all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms.

2 Vierros et. al (2007).

3 ibid.

4 Leary (2007).

5 Vierros et. al (2007).

6 Leary (2008a).

7 ibid.
8 Leary (2008b).
9 Leary (2008b).
10 Vierros et. al (2007).
11 Vierros et. al (2007).
12 Ruth (2006).
13 UNEP (2007).
14 Glowka (1996).
15 Glowka (1996).
16 Leary (2007).
17 Ibid.
18 ibid.
19 Leary (2007).
20 Leary (2007).
21 Arico (2008).
22 Leary (2007).
23 ibid
24 Leary (2007).
25 Leary (2007).
26 ibid
27 ibid
28 Leary (2007).
29 Leary (2007).
30 Leary (2007).
31 ibid
32 ibid
33 ibid
34 Arico and Salpin (2005).
35 Arico and Salpin (2005).
36 See Leary (2007); and Arico and Salpin (2005).
37 Arico and Salpin (2005).
38 Leary (2007), See also Arico and Salpin (2005).
39 Participants in the Nice Workshop identified a variety of options for considering the special issues involved in the management of marine genetic resources, as follows:
- Identify: a) potential benefits from research and commercialization of marine genetic resources in areas beyond national jurisdiction; b) options for benefit sharing, including learning from case studies on best practices; c) modalities for promoting equitable use;
- Promote continued and focused marine scientific research;
- Identify means of data banking, knowledge management and sharing i.e. the biotech industry should provide information on where the samples of organisms identified to be of medicinal, industrial, other value, have been collected, for management and conservation purposes;
- Involve the biotech industry in the planning process;
- Facilitate government-to-government discussions, especially between developed and developing nations;
- Identify and assess management options, which are potentially applicable in addressing the threats to marine genetic resources, including codes of conduct, permits and environmental impact assessment, area-based management, and ecosystem-based management, for adoption across sectors and regions;
- Carry out economic analysis; analysis of comparative advantage;
- Form partnerships and formal agreements of collaboration, including memoranda of understanding.

40 Vierros and Wells (unpublished).
41 Global Forum (2008b).
42 See for example Intergovernmental Oceanographic Commission, 2005.

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