



An International Instrument on Conservation and Sustainable Use of Biodiversity in Marine Areas beyond National Jurisdiction

Exploring Different Elements to Consider

PAPER III

Options and Approaches for Access and Benefit-sharing*

By Thomas Greiber

Commissioned by the German Federal Agency for Nature Conservation with funds from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.



* DISCLAIMER: The views expressed in this paper do not necessarily reflect those of the German Federal Agency for Nature Conservation or the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

1. Background

At the 2012 United Nations Conference on Sustainable Development (Rio+20), States committed themselves ‘to address, on an urgent basis, building on the work of the Ad Hoc Open-ended Informal Working Group and before the end of the sixty-ninth session of the General Assembly, the issue of the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, including by taking a decision on the development of an international instrument under the United Nations Convention on the Law of the Sea.’¹ This commitment was recalled and reaffirmed by the United Nations General Assembly (UNGA) in its 67th and 68th session.² In its resolution 68/70, the UNGA also requested the United Nations 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 (UN Working Group) to make recommendations to the UNGA ‘on the scope, parameters and feasibility of an international instrument under the Convention’.³ These recommendations shall help to prepare for the decision to be taken at the 69th session of the UNGA in 2015, whether to start the negotiation of an international instrument on the conservation and sustainable use of biodiversity in areas beyond national jurisdiction (ABNJ).

The International Union for Conservation of Nature (IUCN) in collaboration with different partners has prepared a series of policy briefs to provide technical input to the ongoing ABNJ discussions, and thereby support the UNGA decision-making process. As indicated in **Paper I**, one of the issues to be discussed under ‘parameters’ could be access to marine genetic resources from ABNJ and equitable benefit-sharing. The following paper aims to briefly explain the challenges with regard to marine genetic resources from ABNJ, before clarifying existing access and benefit-sharing (ABS) approaches and their applicability to ABNJ. The paper will then illustrate different options for regulating ABS through an international instrument for ABNJ under the United Nations Convention on the Law of the Sea (UNCLOS).

2. Opportunities and Challenges

Until relatively recently, genetic resources from the terrestrial environment have been the main focus of major research and development (R&D) in biotechnology, as far more species of plants and animals are presently known in the terrestrial environment than in the oceans.⁴ Yet the marine realm represents 70% of the biosphere, hosts a greater diversity of major animal groups (phyla) than the terrestrial environment, and also provides for a wide range of extreme environmental conditions to which organisms had to adapt over time in order to develop and survive. This raises expectations

¹ UNGA resolution 66/288. ‘The future we want.’ UN doc. A/RES/66/288, of 11 September 2012. Paragraph 162.

² UNGA resolution 67/78. ‘Oceans and the law of the sea.’ UN doc. A/RES/67/78, of 11 December 2012. Paragraph 181. UNGA resolution 68/70. ‘Oceans and the law of the sea.’ UN doc. A/RES/68/70, of 9 December 2013. Paragraph 197.

³ UNGA resolution 68/70. ‘Oceans and the law of the sea.’ UN doc. A/RES/68/70, of 9 December 2013. Paragraph 198.

⁴ Juniper, S. K. (2013). ‘Technological, Environmental, Social and Economic Aspects.’ IUCN Information Papers on Marine Genetic Resources. P. 17.

that marine organisms (from within as well as beyond national jurisdictions) are an abundant source of bioactive compounds and of novel molecules and materials for present and future R&D.⁵

However, opportunities for R&D on marine genetic resources from ABNJ need to be seen in light of a number of challenges and constraints, such as the following:

- **High investment costs**

The costs for collecting marine organisms in coastal areas can be rather moderate. However, expenditures substantially increase when oceanographic means, such as special research vessels or even submersibles, are required to access marine genetic resources from interesting ecosystems on the high seas or in the deep sea.⁶ Further costs accrue after the sampling takes place throughout the different steps of R&D, from the storage of samples in repositories under appropriate conditions together with associated metadata, to DNA isolation, purification, sequencing, activity screening, and eventual commercialization of products.⁷

- **Uneven distribution of technologies and expertise**

Lack of sufficient R&D capacities, both intellectual and technological, limit many countries in benefiting from the scientific as well as commercial opportunities related to marine genetic resources. More than 40 countries possess offshore research vessels, but the majority of them belong to a small number of developed countries.⁸ The number of deep diving scientific submersibles is even more limited and operated by a subset of developed countries currently leading marine scientific research.⁹ Furthermore, the majority of leading marine biotech experts is located in developed countries, as indicated by the geographic distribution of marine biodiversity publications as well as patent claims for genes of marine origin.¹⁰

- **Lack of legal clarity and certainty**

So far, marine genetic resources in ABNJ are not regulated through a specific international legal instrument. The scope of the ABS regime established by the Convention on Biological Diversity (CBD) and its Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (Nagoya Protocol) is limited to genetic resources over which States have sovereign rights (Article 15.1 of the CBD and Article 3 of the Nagoya Protocol). Therefore, marine genetic resources from ABNJ are not covered. The UNCLOS sets out the legal framework within which

⁵ See for example Horizon 2020, the EU Framework Programme for Research and Innovation at www.2020-horizon.com/Innovative-marine-biodiscovery-pipelines-for-novel-industrial-products-i284.html.

⁶ Broggiato, A., Arnaud-Haond, S., Chiarolla, C., Greiber, T. (2014). *'Fair and Equitable Sharing of Benefits from the Utilization of Marine Genetic Resources in Areas beyond National Jurisdiction: Bridging the Gaps between Science and Policy.'* Marine Policy.

⁷ Ibid.

⁸ Juniper, S. K. (2013). *'Technological, Environmental, Social and Economic Aspects.'* IUCN Information Papers on Marine Genetic Resources. P. 18.

⁹ Ibid.

¹⁰ Hendriks, I. E., Duarte, C. M. (2008). *'Allocation of effort and imbalances in biodiversity research.'* Journal of Experimental Marine Biology and Ecology. Arnaud-Haond, S., Arrieta, J. M., Duarte, C. M. (2011). *'Marine biodiversity and gene patents.'* Science 331, 1521-1522.

all activities in the oceans and seas must be carried out,¹¹ thus in theory also for ABS with regard to marine genetic resources from ABNJ. However, marine genetic resources are not mentioned in any UNCLOS provision, and 'resources' regulated by Part XI of the UNCLOS are explicitly defined as mineral resources, meaning only non-living resources and not marine genetic resources (Article 133(a) of the UNCLOS). Therefore, it can be argued that the benefit-sharing obligations under Part XI do not apply to marine genetic resources from ABNJ, but rather the freedom of the high seas. This freedom again is not unlimited, as indicated in Article 87.1 and 2, and Article 88 of the UNCLOS, but for example subject to the provisions on marine scientific research (MSR) which embody different forms of benefit-sharing (see Section 5. below). Yet there is no framework to specify, coordinate, promote and monitor the implementation of these benefit-sharing obligations. In sum, this leads to a lack of legal clarity and certainty which could be solved through a future international instrument on ABNJ under the UNCLOS.

3. Existing ABS Approaches

When analyzing possible options for regulating ABS with regard to marine genetic resources from ABNJ, two broad ABS approaches need to be distinguished:

- **Bilateral approach**

The bilateral ABS approach is the one applied by the CBD and its Nagoya Protocol where ABS transactions are foreseen between a country where a genetic resource can be found within its jurisdiction (i.e. one provider), and an individual or entity that requests access to this resource in order to use it for R&D on its genetic and/or biochemical composition (i.e. one user). The provider is obliged to facilitate access to the genetic resources found within its national jurisdiction, but has the sovereign right to make such access subject to the granting of prior informed consent (usually a permit) and mutually agreed terms (the conditions identified in an ABS contract). The user must share benefits with the provider in an equitable and fair way, based on the terms established between the two parties.

Such a bilateral approach is not applicable to marine genetic resources from ABNJ under the existing UNCLOS regime, as these resources do not fall under the jurisdiction of a particular State or the authority of a global entity that could grant its consent and negotiate an ABS agreement with an interested user. Referring to flag State responsibility does not solve the issue, as it would lead to a situation where benefits were only shared with flag States and not with the entire international community. Creating a global entity or expanding the mandate of an existing one (such as the International Seabed Authority) is, of course, possible if the necessary political will exists. However, organizing a bilateral ABS approach through a global entity is likely to lead to high management costs and bureaucracy. This would rather hamper than facilitate future R&D and consequently benefit-sharing with the international community.

- **Multilateral approach**

Multilateral ABS approaches are found in the FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) or the Pandemic Influenza Preparedness Framework for the Sharing of Influenza Viruses and Access to Vaccines and Other Benefits (PIFP) which was adopted

¹¹ UNGA resolution 65/37A. 'Oceans and the law of the sea.' UN doc. A/RES/65/37A, of 7 December 2010. Preamble.

under the World Health Organization. These approaches establish ABS systems in the form of common pools of resources which are designed to facilitate access to genetic resources, and ensure the fair and equitable sharing of benefits arising from their utilization based on multilaterally agreed terms.

While these examples of common pools apply only to a limited number of genetic resources (those plant genetic resources for food and agriculture listed in Annex I of the ITPGRFA and the influenza viruses covered by the PIPF), a narrow scope of application is not necessary a prerequisite for the creation of a common pool of genetic resources but rather a result of political compromise. A common pool could therefore be created to cover all marine genetic resources from ABNJ as well as associated information. It could follow the overall objective of the ITPGRFA and the PIPF pools, namely to build a framework which promotes R&D. Furthermore, a number of ABS instruments and characteristics (such as the development of standard material transfer agreement(s), differentiated and flexible access rights and benefit-sharing obligations, or the regulation of intellectual property rights) could provide inspiration, be adjusted and further developed to apply to marine genetic resources from ABNJ as well as related R&D needs.

4. Regulating Access

A multilateral ABS system creating a common pool could first of all establish access rules. In this regard, a differentiated view is needed in relation to access to *in situ* resources on the one hand, and access to *ex situ* resources, *in silico* analysis, as well as relevant technology on the other hand.

- **Access to *in situ* resources**

Access to *in situ* resources refers to the collection of samples of marine genetic resources within their natural surroundings. With regard to such access, questions of substantive scope, as well as sustainability of the access activities arise. The latter could be regulated through environmental impact assessment procedures which build another component of a potential international instrument for ABNJ (see **Papers VII and VIII**). Regarding the question of substantive scope it is important to recall that sampling takes place not only in the Area but also in the water column beyond areas of national jurisdiction. Marine genetic resources from both 'environments' should therefore be covered by a multilateral ABS system for ABNJ.

- **Access to *ex situ* resources, *in silico* analysis and relevant technology**

Access to *ex situ* resources refers to access to samples of marine genetic resources which were previously collected in ABNJ and are now stored outside of their natural habitats in so called biorepositories. Access to *in silico* analysis means access to knowledge associated with (directly related to) marine genetic resources, i.e. any observational or experimental data, information and other findings on the composition, life conditions and functions of the accessed genetic resources. Access to relevant technology refers to appropriate transfer of technologies which are relevant to the utilization of marine genetic resources, including also technological cooperation.

The regulation of these forms of access under a potential international instrument for ABNJ is critical mainly from the benefit-sharing perspective. Indeed, granting such access through a multilateral system would provide important non-monetary benefits for the global community while promoting and facilitating further R&D at the same time.

5. Sharing Benefits

Two broad categories of benefits are normally distinguished and regulated in the ABS context: monetary as well as non-monetary benefits.¹²

Non-monetary benefits

Sharing of non-monetary benefits is often perceived as the most practical and immediately valuable consequences of ABS, as the chances of R&D leading to a commercial product and generating monetary benefits are relatively small. As mentioned before, the UNCLOS provisions related to MSR already foresee different forms of non-monetary benefit-sharing: Promoting international cooperation in MSR (Articles 242 and 143.3(a)); making knowledge resulting from MSR available by publication and dissemination (Articles 244.1 and 143.3(c)); and promoting data and information flow and transfer of knowledge (Articles 244.2 and 144.2). These provisions may provide a basis for the further development of non-monetary benefit-sharing obligations under a multilateral ABS system.

Such a system could, amongst others, focus on the following non-monetary benefits:

- Facilitated access to *ex situ* resources, *in silico* analysis, and technology (see above);
- Collaboration and cooperation in R&D programmes; and
- Different types of capacity-building, from general education and institutional capacity-building to more specific training related to genetic resources.

It is important to note that such non-monetary benefit-sharing is already practiced to some extent. Transfers of previously collected genetic resources take place within different research communities; a large number of databases provide different types of information relevant for R&D on marine genetic resources; numerous global and regional research programmes and initiatives promote collaboration and cooperation thereby exchanging knowledge, sharing technologies, and building capacities; furthermore, several codes of conduct establishing benefit-sharing principles on a voluntary basis have been developed or are under development at the regional and global level.¹³

However, current benefit-sharing practices largely depend on the types of resources dealt with, the R&D sectors involved and their willingness to share, as well as the geographical location of actors. They are neither fully comprehensive (covering all marine genetic resources and R&D sectors), inclusive (benefiting actors from all States), nor equitable (following harmonized standards and approaches), but rather ad hoc and opportunistic. This affects the extent, quality, efficiency and effectiveness of non-monetary benefit-sharing in practice, and means a disadvantage not only for developing countries but rather entire global research community. An international instrument for ABNJ could improve this situation by putting in place an overall strategy as well as a structured framework to promote the coordination and integration of the diverse benefit-sharing activities.

¹² The Nagoya Protocol provides a comprehensive, non-exhaustive list of monetary as well as non-monetary benefits that can be shared in the ABS context.

¹³ See for example, Broggiato, A. (2013). 'Exchange of Information on Research Programs Regarding Marine Biodiversity in Areas beyond National Jurisdiction.' IUCN Information Papers on Marine Genetic Resources. Pp. 62-69.

Monetary benefits

Monetary benefits can also be shared in different forms, as indicated in Paragraph 1 of the Annex to the Nagoya Protocol. But given the specificities of R&D on marine genetic resources from ABNJ, some types of monetary benefit-sharing might be more applicable than others. Therefore, taking a differentiated and realistic point of view is absolutely necessary.

A multilateral ABS system could envisage the payment of money at different stages in the chain of access and utilization of genetic resources. An obligation to make payments already at the outset of R&D, i.e. before access to *in situ* resources takes place, appears to be not very practical and constructive in the context of marine genetic resources from ABNJ. Such upfront payments are usually only foreseen where R&D has a clear commercial intent. The objectives of sampling cruises in ABNJ, however, are mostly non-commercial or hybrid making it difficult to distinguish between a commercial and non-commercial side of R&D from the very beginning. More important, upfront payments would further increase the investment costs for research in the high seas and the deep seabed which are already extensive (see above). Greater financial risks would hamper rather than promote future R&D, and therefore be counterproductive to the aim of benefit-sharing.

Instead, payments at certain milestones in the R&D chain, or after commercialization appear to be more rational. For example, access and license fees could be charged when samples of marine genetic resources are acquired from *ex situ* collections, or associated knowledge and technology is shared. Additional fees and royalties could be envisaged when an invention based on marine genetic resources from ABNJ is protected, or a product is placed on the market.

Currently, no monetary benefit-sharing takes place for marine genetic resources from ABNJ. A legal obligation to make payments is lacking, as well as an overall framework that could manage potential voluntary payments. An international instrument for ABNJ could provide both, a legal basis and an institutional framework to collect mandatory and/or voluntary payments.

6. Conclusions

Some benefit-sharing provisions already exist under the UNCLOS which are implemented in practice to some extent. While they can build a legal basis for non-monetary benefit-sharing under a potential international instrument for ABNJ, they need to be strengthened through a more elaborated regime which ensures comprehensiveness, inclusiveness as well as equity, and at the same time improves coordination and integration to promote efficiency and effectiveness of benefit-sharing activities. In addition, a regime for monetary benefit-sharing could be established which would, however, need to take into consideration the specificities of R&D related to marine genetic resources in ABNJ.

A potential international instrument for ABNJ could thus create a multilateral ABS system applying a number of different ABS tools and approaches, such as:

- **A network of different common pools**

Networks of different common pools could be built, i.e. a framework for integrating, coordinating and accessing biorepositories storing collected samples of marine genetic resources, as well as databanks keeping associated knowledge (e.g. metadata, sequencing data, research results, etc.). Samples and knowledge from these pools could then be made publicly available in order to promote

future R&D. In addition, platforms providing access to related technologies could be linked and further developed.

Contributions to and membership in these networks could follow a differentiated approach. For example, biorepositories and databanks set up with public funding could be obliged to join the networks. In contrast, privately funded initiatives, as well as biorepositories and databanks from States not being a party to the international instrument for ABNJ could be encouraged to join on a voluntary basis. Materials, knowledge or technology developed on the basis of

The development of such networks of common pools would recognize that facilitated access to samples, knowledge and technology constitutes a major benefit for the entire global community, i.e. both developing as well as developed countries.

- **Multilaterally agreed standards**

As the quality of samples and knowledge is critical for their future utilization, international standards could be developed to facilitate future R&D at a global scale. For example, minimum standards could be set clarifying under what conditions materials should be stored in biorepositories and transferred to third parties, or what types of data and information should be collected and published. Furthermore, standard material, data and technology transfer agreements could be developed establishing the specific ABS terms for accessing the networks of common pools.

- **A system of mandatory as well as voluntary payments**

In addition to a network of common pools providing important non-monetary benefits, a regime for monetary benefit-sharing (mandatory as well as voluntary) could be established. First of all, reasonable fees (limited to maintenance costs) could be imagined for accessing the common pools. Mandatory payments could be required if R&D results based on *ex situ* material, knowledge or technology accessed from the common pools network, were protected through intellectual property rights. Unprotected R&D results could again be included in the common pools system, triggering only voluntary payment obligations. Furthermore, the payment of royalties (a share of income) could become mandatory when a product is developed and sold on the market as a result of R&D on marine genetic resources from ABNJ. Such royalties could be collected from '1st degree developers' (i.e. those parties involved in R&D from the outset), but also from '2nd degree developers' (i.e. those who accessed *ex situ* material, knowledge or technology through the common pools network).

- **An ABNJ trust fund**

All payments could go to an ABNJ trust fund. This trust fund would hold and administer the collected assets for the benefit of the global community. The accumulated financial resources could be used to support non-monetary benefit-sharing (e.g. providing funding for capacity-building or joint research undertakings), but they could also be used to support activities related to conservation and sustainable use of marine biodiversity in ABNJ. The latter would be a means to link a benefit-sharing regime with other policy instruments established under an international instruments for ABNJ (such as area-based management tools, including marine protected areas, or environmental impact assessments).

- **Patent pools**

Patent pools are a means to increase availability of existing innovations, and simultaneously support future innovation. Such patent pools could also be established to make inventions based on marine genetic resources from ABNJ and protected through intellectual property rights available to the public. The multilateral ABS system could regulate that results from R&D would need to be included in patent pools, which means that they could still be protected through intellectual property rights, but would have to be made available under certain conditions set out in license agreements. Such license agreements could lead to payments rewarding those ‘feeding’ the patent pools.

- **A framework for increased international collaboration and cooperation**

Finally, international collaboration and cooperation could be promoted by encouraging States and incentivizing researchers to enter into R&D consortia and develop capacity-building initiatives.

List of Papers

Paper I: Introduction on Scope, Parameters and Feasibility

Paper II: Enhancing Cooperation and Coordination

Paper III: Options and Approaches for Access and Benefit-sharing

Paper IV: Governance Principles

Paper V: Understanding Area-based Management Tools and Marine Protected Areas

Paper VI: Options and Approaches for Establishing and Managing MPAs

Paper VII: Relation between Environmental Impact Assessments, Strategic Environmental Assessments and Marine Spatial Planning

Paper VIII: Options for Environmental Impact Assessment Elements

Paper IX: Technology Transfer and Capacity-building

Paper X: Existing Regulatory, Institutional and General Governance Gaps

Paper XI: Basic Ideas for a Possible Institutional Structure

Paper XII: International Procedures to Ensure Science-based Decision-making

Paper XIII: Compliance and Verification Mechanisms