

Moving the Marine Genetic Resources Debate Forward: Some Reflections

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Abstract

This paper offers some brief reflections on issues surrounding the ongoing debate in relation to the legal status of marine genetic resources in areas beyond national jurisdiction. It considers one possible solution to the ideological divide over the relevance of the common heritage of mankind to marine genetic resources, modelled on Article IV of the Antarctic Treaty. The suitability of the International Treaty on Plant Genetic Resources for Food and Agriculture as a possible model is also considered. The fact that this later model is now being canvassed by some States marks a major step forward in international discussions on the issue. Other possible models that have been canvassed in the academic literature are also considered. The fact that these alternatives have not been canvassed at length in diplomatic discussions to date highlights the fact that a detailed examination of the wide range of possible options is urgently needed.

Keywords

International Treaty on Plant Genetic Resources for Food and Agriculture; marine genetic resources; common heritage of mankind; Antarctic Treaty; areas beyond national jurisdiction (ABNJ); bioprospecting

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Introduction

This article offers some brief reflections on several issues surrounding the legal status of marine genetic resources in areas beyond national jurisdiction (ABNJ).² These comments are in response to a Report on these topics prepared by the Netherlands Institute for the Law of the Sea (NILOS), Utrecht University,³ and presented at the Symposium on Biological Diversity and Governance of Areas beyond National Jurisdiction held at NILOS on 8 July 2011. The Symposium was especially timely, coming as it did only one month after the United Nations *Ad Hoc* Open-ended Informal Working Group to Study Issues Relating to the Conservation and Sustainable Use of Marine Biodiversity Beyond Areas of National Jurisdiction (BBNJ Working Group) adopted its recommendations to the United Nations General Assembly by consensus that:

A process be initiated, by the General Assembly, with a view to ensuring that the legal framework for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction effectively address those issues by identifying gaps and ways forward, including through the implementation of existing instruments and the possible development of a multilateral agreement under the United Nations Convention on the Law of the Sea (...)

and that:

this process would address the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction, in particular, together and as a whole, marine genetic resources, including questions on the sharing of benefits, measures such as area-based management tools, including marine protected areas, and environmental impact assessments, capacity-building and transfer of marine technology.⁴

² In accordance with the relevant legal framework provided by the United Nations Convention on the Law of the Sea (LOSC; adopted on 10 December 1982; entry into force 16 November 1994; 1833 UNTS 396), the present commentary will refer to the high seas and the Area as appropriate where these separate components of ABNJ are intended.

³ P. Drankier (ed.), A.G. Oude Elferink, B. Visser and T. Takács, *Marine Genetic Resources in Areas Beyond National Jurisdiction: Access and Benefit-Sharing*, Report on Research Question 3 of the Study on 'Biological Diversity and Governance of the High Seas' (commissioned by the Netherlands Ministry of Affairs, Agriculture and Innovation) (2011). A revised version of this report is included as one of the contributions to this special issue: P. Drankier,* A. Oude Elferink, B. Visser and T. Takács; 'Marine Genetic Resources in Areas Beyond National Jurisdiction: Access and Benefit-Sharing' (2011) 27(2) *The International Journal of Marine and Coastal Law*.

⁴ Letter dated 30 June 2011 from the Co-Chairs of the *Ad Hoc* Open-ended Informal Working Group to the President of the General Assembly, UN Doc. A/66/119, Annex-

Rather than try and cover such a vast topic in detail, this article offers reflections on a few aspects of the debates surrounding marine genetic resources touched on in the Report.⁵ First, it comments briefly on the debate surrounding the common heritage of mankind concept and its relevance to ongoing debates. Second, it offers some thoughts on the relevance of the International Treaty on Plant Genetic Resources for Food and Agriculture⁶ as a model for future action. It is important to note that these comments highlight that this is not the only option that has been put forward, and suggest that we still need a much more detailed examination of the wide range of possible options that are available.

The Debate Surrounding the Common Heritage of Mankind

Three years ago at a conference organised by the Fridtjof Nansen Institute in Oslo, I was asked to speak, very much like I was at the NILOS Symposium, on the topic of international law and the genetic resources of the deep sea. At that point I was beginning to despair that after more than a decade on the international agenda, there had been very little progress on the issue. In that context I deliberately sought to be provocative and decided to speak about the approach adopted by the Group of 77 Countries (G77) to the common heritage of mankind and the question of the status of marine genetic resources in

Recommendations of the *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 and Co-Chairs' Summary of Discussions, available at: <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/397/64/PDF/N1139764.pdf?OpenElement>, paras. 1(a) and 1(b).

⁵ For further detailed discussion on these and other issues by the author, see, for example, D. Leary, *International Law and the Genetic Resources of the Deep Sea* (Martinus Nijhoff, Leiden and Boston 2007); D. Leary, 'International Law and the Genetic Resources of the Deep Sea' in D. Vidas (ed.), *Law, Technology and Science for Oceans in Globalisation. IUU Fishing, Oil Pollution, Bioprospecting, Outer Continental Shelf* (Martinus Nijhoff, Leiden and Boston, 2010) 353–369; D. Leary, 'Marine Genetic Resources: The Patentability of Living Organisms and Biodiversity Conservation' in P. Jacquet, R. Pachauri and L. Tubiana (eds.), *Oceans: The New Frontier* (TERI Press, Delhi 2011) 183–193; D. Leary, 'Bioprospecting and the Genetic Resources of Hydrothermal Vents on the High Seas. What Is the Existing Legal Position and Where Are We Heading?' (2004) 1(2) *Macquarie Journal of International and Comparative Environmental Law* 137–178; and D. Leary, M. Vierros, G. Hamon, S. Arico and C. Monaglel, 'Marine Genetic Resources: A Review of Scientific and Commercial Interest' (2009) 33 *Marine Policy* 183–194.

⁶ International Treaty on Plant Genetic Resources for Food and Agriculture (2001); entered into force 29 June 2004 (text available at <http://www.planttreaty.org/content/texts-treaty-official-versions>).

ABNJ. Frustrated by the lack of progress on the issue, I rather provocatively labelled the approach adopted by the G77 as an example of a “fundamentalist” approach to international law. In that paper I argued:

...it is too early to tell whether the ‘common heritage solution’ (an expanded mandate for the International Seabed Authority) is in fact the *only* or *best* option available for addressing this issue. It is as if (to invoke the rhetoric of an advisor to former US President Lyndon Johnson), a new generation of legal scholars, diplomats and lawyers have inherited a ‘fundamentalist’ gene from their forebears; a gene that dictates that the only solution to all and any international governance issue in the deep sea is the ‘common heritage solution’. By ‘fundamentalist’ in this context I mean views or interpretations of international law ‘that are not very useful as a means to achieving practical and just solutions of difficult political, economic and social problems’.

What I suggest is that to advocate now—as some nations do (the G77 in particular)—that the ‘common heritage solution’ is the only or best solution to this issue is a ‘fundamentalist’ approach to the extent that it seems to ignore the possibility of more practical solutions to the issues surrounding deep sea genetic resources in areas beyond national jurisdiction. There has been little in the way of rigorous and detailed analysis of any of the other possible options in debates at the UN or even more broadly in most of the academic literature that has examined the issue. It is far easier for the ‘fundamentalists’ to fall back on the rhetoric of the ‘common heritage’ discourse than to look seriously at other possibilities. A detailed examination of all options is required: only then are we likely to see progress and practical solutions. If the G77 and China continue down the ‘fundamentalist’ path, that may make it very difficult for a clear resolution of the issue to be achieved. Perhaps a more flexible approach is warranted.

There is a more important reason for avoiding the ‘common heritage of mankind’ debate. Entering into the debate on the application of the common heritage of mankind is, I would argue, a futile exercise—for the simple reason that, whether or not these resources are regarded or subsequently designated as the common heritage of mankind [sic], that still does not address the core issue. Even if marine genetic resources should be regarded as the common heritage of mankind [sic], there is still no mechanism provided in [UNCLOS] to regulate access and provide for benefit sharing. We still have to develop a specific regime tailored to the unique circumstances of the way in which deep sea genetic resources are commercially exploited.⁷

Today I would probably not be so quick to use the label ‘fundamentalist’ to characterise the G77 position, as I would have three years ago. As the outcome of the recent BBNJ Working Group meeting suggests, there are some positive signs that countries appear to be moving away from entrenched ideological positions and instead are beginning to focus on the real issues at hand.

⁷ Leary (2010), *supra* note 5 at pp. 365–366 (emphasis provided; footnotes omitted).

However, that is not to say that the dispute over the applicability of the common heritage of mankind or otherwise will necessarily go away. There are now many differing views on the relevance of the common heritage of mankind to the debate surrounding marine genetic resources in ABNJ. The views of States are already well known and it is clear that there are differing views on the existing law between States.

The NILOS Report seems to argue in support of the applicability of the common heritage concept. But many others would not agree. Significant differences of opinion are evident in the academic literature. In the last decade or so, many different views have been expressed on the relevance or irrelevance of the common heritage of mankind to marine genetic resources in ABNJ. After reviewing nearly all of the literature that has been published on this question, I would argue that it is possible to discern four broad approaches to questions of the relevance of the common heritage of mankind to the debate: (1) those authors who maintain that marine genetic resources in ABNJ are covered by the common heritage of mankind;⁸ (2) those who acknowledge that they fall outside the common heritage but advocate that they should be brought within the common heritage of mankind;⁹ (3) those who maintain that freedom of the high seas is the relevant principle and that therefore they are free to all who want to access and use them;¹⁰ and (4) a fourth group of

⁸ See A. Oude Elferink, 'The Regime of the Area: Delineating the Scope of Application of the Common Heritage Principles and Freedom of the High Seas' (2007) 22(1) *The International Journal of Marine and Coastal Law* 143–17; Y. Tanaka, 'Reflections on the Conservation and Sustainable Use of Genetic Resources in the Deep Seabed Beyond the Limits of National Jurisdiction' (2008) 39(2) *Ocean Development and International Law* 129–149; J. Rochette and R. Bille, 'Governance of Marine Biodiversity Beyond National Jurisdictions: Issues and Perspectives. Report of the International Seminar "Towards a New Governance of High Seas Biodiversity"' (2008) 51 *Ocean & Coastal Management* 779–781; C. Lawson and S. Downing, 'It's Patently Absurd—Benefit Sharing Genetic Resources from the Sea Under UNCLOS, the CBD and TRIPs' (2002) 5 *Journal of International Wildlife Law and Policy* 211–233; and F. Pfirter, 'The Management of Seabed Living Resources in "The Area" Under UNCLOS' (2006) 11 *Revista Electronica de Estudios Internacionales* 1–29.

⁹ See L. de La Fayette, 'A New Regime for the Conservation and Sustainable Use of Marine Biodiversity and Genetic Resources Beyond the Limits of National Jurisdiction' (2009) 24 *The International Journal of Marine and Coastal Law*, pp. 221–280; T. Scovazzi, 'Protection of the Environment, Scientific Research and Bioprospecting: Some Considerations on the Role of the International Sea-Bed Authority' (2004) 19 *International Journal of Marine and Coastal Law* 383–410; and N. Matz, 'Marine Biological Resources: Some Reflections on Concepts for the Protection and Sustainable Use of Biological Resources in the Deep Sea' (2002) 2 *Non-State Actors and International Law* 279–300.

¹⁰ See L. Glowka, 'The Deepest of Ironies: Marine Scientific Research, Genetic Resources and the Area' (1996) 12 *Ocean Yearbook* 154–177; L. Glowka, 'Genetic Resources, Marine Scientific Research and the International Seabed Area' (1999) 8(1) *Review of European Community and International Environmental Law* 58–66; C. Allen, 'Protecting the Oceanic Gardens of

authors who acknowledge that there is uncertainty on this point and do not express a clear conclusion on the question either way.¹¹

While countries are now showing signs of focussing on more pragmatic approaches to on-going diplomatic negotiations in relation to this issue, it is clear that the ideological divide over the common heritage of mankind will continue to linger for a long time to come. The key issues surrounding the design of an access and benefit-sharing regime for ABNJ may in theory be solved by negotiation. But it is unrealistic to expect that the ideological divide over this issue can ever be bridged. Neither side will be able to convince the other that its interpretation of the applicability of the common heritage of mankind or otherwise is the correct interpretation of international law. As noted above, both sides have many academic commentaries to support their argument.

How then might we get around that divide on this key point? One possible solution touched on in the NILOS Report is that States could agree to disagree. There are clearly precedents for this in international treaties, such as the Antarctic Treaty.¹² One of the major achievements of the Antarctic Treaty is the way it has dealt with actual and potential disputes with respect to territo-

Eden: International Law Issues in Deep Sea Vent Resources Conservation and Management' (2001) 13 *Georgetown International Environmental Law Review* 563–660; Leary (2004), *supra* note 5; Leary (2007), *supra* note 5; S. Bonney, 'Bioprospecting, Scientific Research and Deep Sea Resources in Areas Beyond National Jurisdiction: A Critical Legal Analysis' (2006) 41 *New Zealand Journal of Environmental Law* 41–91; R. McLaughlin, 'Settling Trade-Related Disputes Over the Protection of Marine Living Resources: UNCLOS or the WTO?' (1997) 10 *The Georgetown International Environmental Law Review* 29–96; F. Lehman, 'The Legal Status of Genetic Resources of the Deep Seabed' (2007) 22 *New Zealand Journal of Environmental Law* 33–66; Lawson and Downing, *supra* note 8; J. Jabour-Green and D. Nicol, 'Bioprospecting in Areas Outside National Jurisdiction: Antarctica and the Southern Ocean' (2003) 4 *Melbourne Journal of International Law* 76–111.

¹¹ See D. Anton, 'Law for the Sea's Biological Diversity' (1997) 36 *Columbia Journal of Transnational Law* 341–371; T. Lowry, 'Protecting the Mysteries of the Deep: Conserving Biodiversity in Marine Areas Beyond National Jurisdiction' (2007) 16 *Dalhousie Journal of Legal Studies* 113–134; C. Salpin and V. Germani, 'Patenting of Research Results Related to Genetic Resources from Areas Beyond National Jurisdiction: The Crossroad of the Law of the Sea and Intellectual Property Law' (2007) 16(1) *Review of European Community & International Environmental Law* 12–23; K. Zewers, 'Bright Future for Marine Genetic Resources, Bleak Future for Settlement of Ownership Rights: Reflections of United Nations Law of the Sea Consultative Process on Marine Genetic Resources' (2007) 5(2) *Loyola University Chicago International Law Review* 151–176; P. Prows, 'Tough Love: The Dramatic Birth and Looming Demise of UNCLOS Property Law (and What Is to Be Done About It)' (2007) 42 *Texas International Law Journal* 241–309; M. Rimmer, 'The Sorcerer II Expeditions: Intellectual Property and Biodiversity' (2009) 6 *Macquarie Journal of International and Comparative Environmental Law* 147–220.

¹² Antarctic Treaty (adopted on 1 December 1959, entered into force 23 June 1961) 402 UNTS 71.

rial claims in Antarctica. Seven countries—Argentina, Australia, Chile, France, New Zealand, Norway and the UK—each claim parts of Antarctica as their sovereign territory. The USA, Russia, Japan, Germany, the Netherlands and India, although parties to the Antarctic Treaty, do not recognise the validity of any of these claims, while both Russia and the USA have reserved the right to make their own claims to any or all of Antarctica.

Despite the existence of these clearly entrenched views on the various claims to sovereignty over Antarctica, Article IV of the Antarctic Treaty has found a novel way to reconcile seemingly irreconcilable positions on the sovereignty question. Article IV provides:

1. Nothing contained in the present Treaty shall be interpreted as:
 - (a) a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
 - (b) a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;
 - (c) prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's right of or claim or basis of claim to territorial sovereignty in Antarctica.
2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

Could a similar approach, and especially one inspired by Article IV(2), be applied with respect to the common heritage of mankind question? That is to say, could, for example, States agree along the following lines:

Noting the divergence of views amongst states as to the status of genetic resources found in the ocean space beyond national jurisdiction [Area?]¹³ as falling within the common heritage or mankind or otherwise, Contracting Parties have agreed that no acts or activities taking place while the present [Treaty/protocol/agreement]¹⁴ is in force shall constitute a basis for asserting, supporting or denying a claim that the genetic resources found in the ocean space beyond national

¹³ The jurisdictional scope of the new instrument would need to be negotiated. Should it apply to the Area or to all of ocean space beyond national jurisdiction?

¹⁴ This wording depends on whether a treaty, protocol or some other instrument, such as an agreement, is adopted. This depends ultimately on the outcome of negotiations.

jurisdiction [Area?] are the common heritage or mankind or have some other status, but have instead agreed that the sustainable management, regulation of access and benefit-sharing of such genetic resources shall be governed by the regime as set out in the provisions of this [Treaty/protocol/agreement].

Now this attempt at drafting could probably be better refined by those more experienced in the art and craft of treaty negotiation than myself. I am not suggesting that this particular sample text is something that should be taken away to the next round of negotiations. But the important point I am trying to make is that a provision such as this, either in the preamble or operative provisions of a future treaty or other protocol, might be one possible way to help to bridge the ideological divide on the common heritage issue. The focus can then be, as it probably always should have been, on the key substantive issues surrounding access and benefit-sharing and the range of other far more significant issues, such as area-based management tools, marine protected areas, mechanisms for environmental impact assessment, capacity-building and the transfer of marine biotechnology, rather than the divisive ideological debate surrounding the common heritage of mankind.

The International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA Treaty) and Other Options

The second issue to consider is to what extent does the PGRFA Treaty offer as a possible model for a future regime? Have any other options been put forward? The background to the PGRFA Treaty has been well spelt out in the NILOS Report, so I will not go over it again, but would instead make a few brief observations.¹⁵ The first thing to note is that while the features like the multilateral system of access and benefit-sharing contained in the PGRFA Treaty do make this an appealing model, a number of elements of this model will require significant modification to make it suitable in the context of marine genetic resources sourced from ABNJ.

One of the greatest weaknesses of the PGRFA Treaty as a model for marine genetic resources from ABNJ is the fact that the multilateral system only applies to a specified fixed list of crops set out in Annex 1 to the Treaty. In the context of marine biodiversity and developments in marine biotechnology, while in theory we could make a long list of species to which a new marine

¹⁵ For a more detailed examination of the PGRFA Treaty see C. Chiarolla, *Intellectual Property, Agriculture and Global Food Security. The Privatization of Crop Diversity* (Edward Elgar, Cheltenham and Massachusetts, 2011).

genetic resources regime would apply, we could never possibly hope to capture all or even just a few of the main species of interest in that list. Science is discovering new species all the time, while industry research and development also advances at a rapid rate.

As such, the possible species or compounds, etc., that we might want to add to the list are constantly changing. Recent figures on published scientific literature in this field are worth highlighting to illustrate this point. In a publication in 2010, Blunt has noted that in a survey of scientific literature published only in the year 2008, some 371 scientific articles were published describing 1065 new compounds alone.¹⁶ Earlier annual reviews by the same author have noted similar figures over previous years.

How could we possibly keep up with revisions to such a list and be sure it is comprehensive in light of the rapid and ever expanding body of scientific literature in this field? The list would be out of date way before any hypothetical future treaty could be negotiated, let alone signed, ratified and entered into force.

Adding to the list following the PGRFA Treaty model would also be made all the more difficult unless we modified the procedure for additions to that list. Under that model, amendments to Annex 1 are essentially treated as amendments to the Treaty and would require a consensus amongst all States Parties for the change to be adopted.¹⁷

Clearly some alternative method for including species as scientific knowledge grows would need to be developed. In theory the new regime could be made applicable to all marine biodiversity, but then that would lead diplomats into other complex issues. For example, how would we distinguish between taking species for bioprospecting purposes as opposed to fishing? Clear definitions distinguishing the two would be required. How would we distinguish between marine scientific research and bioprospecting?

¹⁶ J. Blunt, B. Copp, M. Munro, P. Northcote and N. Prinsep, 'Marine Natural Products' (2010) *Natural Product Reports* 165–237.

¹⁷ Article 23 of the PGRFA Treaty provides that amendments to the Treaty shall be adopted at a session of the Governing Body. The text of any proposed amendment is required to be communicated to Contracting Parties by the Secretary at least six months before the session at which it is proposed for adoption. All amendments to the Treaty shall only be made by consensus of the Contracting Parties present at the session of the Governing Body. Any amendment adopted by the Governing Body comes into force among Contracting Parties having ratified, accepted or approved it on the ninetieth day after the deposit of instruments of ratification, acceptance or approval by two-thirds of the Contracting Parties. Thereafter the amendment shall enter into force for any other Contracting Party on the ninetieth day after that Contracting Party deposits its instrument of ratification, acceptance or approval of the amendment.

It is important to note that whatever mechanism ultimately may be developed, we would also need to keep up with the pace of commercial development. A major obstacle to this would be the fact that most commercial research and development takes place in secret, due to concerns about commercial confidentiality.

Another issue surrounds quantification of the benefit to be shared. Under the PGRFA Treaty, the Standard Material Transfer Agreement, which operates under the multilateral system, provides that with certain exceptions:

if a Recipient, its affiliates, contractors, licensees, and lessees, commercializes a Product or Products, then the Recipient shall pay one point-one percent (1.1 %) of the Sales of the Product or Products less thirty percent (30%).¹⁸

If a blanket royalty structure were applied in the context of biotechnology developed from marine biodiversity, this margin in effect will come off the bottom line of any profits made by the developer of a new product. To adopt such a “one rate fits all” template is a very risky approach, given the very little data available on the nature and scale of bioprospecting in the marine environment.¹⁹ Simply put, I think policy makers have either no, or at best a very poor, understanding of the way in which biotechnology is developed by business and what the financial implications of applying a fixed percentage across all products might be. One size does not fit all.

Before any State advocates such an approach, I think we need much more information on the economics and profitability of business in this field. I am somewhat critical of the unreasonable expectations that have arisen with respect to the value of marine genetic resources—what I like to call the ‘pot of gold mentality’. Although there is clearly significant commercial interest in marine biotechnology, I still do not think we have any clear idea of its value.

It is very important to bear in mind that the path from sample collection to profitable drugs or other products can take many years and involve the expenditure of vast sums of money on research and development, often in the range of hundreds of millions of dollars, with no guarantee of commercial success. As one researcher has commented:

[Marine biotechnology] is only truly successful when someone manages to profitably sell a finished product to a customer. To successfully develop a product takes a lot more than just good research. There has to be a market for the product and the market has to be willing to pay a price for the product that allows a *profit-*

¹⁸ PGRFA Treaty, Annex 2.1.

¹⁹ For further discussion of this point see Leary *et al.* (2009), *supra* note 5.

able return on the research, development, production, transport, marketing and sales costs of the product [...]. Most products fail.²⁰

The process of product development starts with the selection of appropriate biological materials, followed by screening for a desired attribute. This leads to the selection of the best option from a short list of positive hits, and culminates with the development of a commercial product or process.²¹ But there are many points along the way where product development can grind to a halt. As Firn²² has suggested, the process of developing a new drug beyond screening raises many questions. These include:

- Will the drug be safe to use (e.g., are there adverse side effects due to the chemical having more than one effect?)
- Is the drug clinically useful? (e.g., does the effect found in the test tube translate into a positive outcome for the patient?)
- Can the chemical be extracted, synthesized or produced by fermentation on an industrial scale economically?
- Can the drug and its derivatives be adequately protected by patents?
- Is the market big enough to pay the typical \$500 million development costs for the drug?²³

What Other Options Are There?

While clearly some issues still need to be resolved before the PGRFA Treaty could be adopted as a suitable model, one of the refreshing aspects about consideration of this model is the fact that some States are now starting to look for alternative models beyond the polarised models at the centre of the debate surrounding the common heritage of mankind. One of the major problems with the debates so far on this issue is the lack of serious detailed examination of the range of possible models.

²⁰ D. McKenzie, 'Commercialising Marine Biotechnology: Road to Riches or Rocky Path?' Conference paper abstract in Abstract Book of the 6th International Marine Biotechnology Conference and 5th Asia Pacific Marine Biotechnology Conference (Chiba, Japan, 21–27 September 2003) 50 (emphasis provided).

²¹ A. Bull, A. Ward, and M. Goodfellow, 'Search and Discovery Strategies for Biotechnology: the Paradigm Shift' (2000) 64(3) *Microbiol Molecular Biology Review* 573–606.

²² R. Firn, 'Bioprospecting—Why Is It So Unrewarding?' (2003) 12 *Biodiversity and Conservation* 207–216.

²³ *Ibid.*, at p. 209.

There is not enough space in this short article to examine all the options that have been put forward. But it is worth noting a few ideas that have been raised in the course of academic discussion of this issue.

First, as noted above, some of the academic literature has suggested that the International Seabed Authority (ISA) already has a mandate. However, even those who argue this point do concede that there may be some need for the ISA to develop rules and regulations to implement this mandate.²⁴ Others have argued that a new protocol or implementing agreement is required to expand (or clarify) how that mandate can be operationalized. Oude Elferink, for example, has suggested that the “principles governing the Area are applicable to their management and use [but] do not prescribe a specific regulatory regime, and the regime of Part XI is not an appropriate model for other uses of the Area”.²⁵ Others, such as Lawson and Downing, suggest there is a need to “tighten international law to close the existing gaps and to implement the benefit sharing provisions of the common heritage doctrine.”²⁶

Scovazzi goes some way towards recognising that perhaps the ISA is not the only option when he notes that it does not need to “become the overarching regulatory body”.²⁷ Others have suggested that perhaps what is needed is a new protocol or implementing agreement to the LOSC.²⁸

Beyond the LOSC some have suggested that the 1992 Convention on Biological Diversity (CBD)²⁹ provides an appropriate legal model and that perhaps some new body could be created pursuant to a protocol to the CBD.³⁰ Other treaties have also been suggested, including proposals for a *sui generis* system of patents for microorganisms linked to a requirement for disclosure of origin under the Budapest Treaty³¹ via an implementing agreement.³² However, one immediate problem with such a model is the fact that it is not just microorganisms that are subject to bioprospecting in ABNJ. In earlier articles I have also suggested one other possible model might be the creation of a

²⁴ See, for example, Pfrtner, *supra* note 8 at p. 28.

²⁵ Oude Elferink, *supra* note 8 at p. 174. See also de La Fayette, *supra* note 9.

²⁶ Lawson and Downing, *supra* note 8 at p. 233.

²⁷ See Scovazzi, *supra* note 9 at p. 407.

²⁸ See, for example, Lowry, *supra* note 11, and Tanaka, *supra* note 8.

²⁹ Convention on Biological Diversity (adopted on 5 June 1992; entered into force 29 December 1993) 31 ILM (1992).

³⁰ See for example Rimmer, *supra* note 11, and Anton, *supra* note 11.

³¹ Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (adopted on 28 April 1977; entered into force 19 August 1980) 9 ATS (1987).

³² See, for example, Lehman, *supra* note 10, and Salpin and Germani, *supra* note 11.

global commons trust fund managed by the World Bank as part of the Global Environment Facility.³³

Besides these single treaty or protocol approaches, more nuanced suggestions recognise the need to avoid fragmentation across different international treaty systems. Matz, for example, has noted that there is a need to:

... try and harmonise these diverging approaches in a new treaty on marine biological resources, open to all states regardless of whether they are a states [sic] party to the [CBD or UNCLOS]. [...]

A new convention must be based on the common heritage approach and must lay down detailed rules on research, a licensing system to gather information on who undertakes which projects in which area and provisions on risk and benefit sharing concerning the commercial use of research results and developments from marine biological resources. The issue of benefit sharing, particularly technology transfer is very sensitive and will call for harmonisation with the rules under the [Agreement on Trade-Related Aspects of Intellectual Property Rights] (TRIPS).^{34,35}

Others go in the opposite direction, advocating, perhaps unrealistically, that bioprospecting be prohibited.³⁶ Perhaps offering a middle ground, others have suggested a “soft law” approach, through the adoption of codes of conduct regulating research practices.³⁷

Conclusion

Up until now the debate on the status of marine genetic resources in ABNJ has been mired in the intractable debate surrounding the applicability or otherwise of the common heritage of mankind. Now the debate seems to have taken a significant step forward. The willingness of parties to the negotiations to consider other options is long overdue and offers more possibility for progress than continuing the rather fruitless debate on the common heritage question.

³³ See Leary (2007), *supra* note 5.

³⁴ See Matz, *supra* note 9 at pp. 296–297 (footnote suppressed).

³⁵ Agreement on Trade-Related Aspects of Intellectual Property Rights, 15 April 1994, Marrakesh Agreement Establishing the World Trade Organisation, Annex 1C, GATT Doc. MTN/FAII-A1C, 33 ILM 1197.

³⁶ See Bonney, *supra* note 10 at p. 44.

³⁷ See L. Glowka, ‘Putting Marine Scientific Research on a Sustainable Footing at Hydrothermal Vents’ (2003) 27(4) *Marine Policy* 303–312.

The PGRFA Treaty is by no means the only possible model that has been put forward. As the brief comments above have highlighted, several other possible models have been suggested, although so far none have been examined in any great detail. All of these models offer strengths and weaknesses. This brief survey of the literature shows that there are many options to consider. So far there has been no detailed examination of these and other options. Such a study is long overdue and might be a useful first step that should be undertaken if we are to continue to move the negotiations forward in any meaningful way beyond the entrenched ideological positions.

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