

En Route to a New International Regime for Access and Benefit Sharing of Marine Genetic Resources.

Kushal Qanungo, Ph.D.

Department of Applied Sciences and Humanities,
Faculty of Engineering and Technology,
Mody Institute of Technology and Science (Deemed University),
Lakshmanagarh, Dist Sikar-332311, Rajasthan, India

*E-mail: kqanungo.et@mitsuniversity.ac.in

ABSTRACT

There is increased commercial interest in the use of marine genetic resources and a great disparity between the developed and developing countries in their capability to exploit these resources. In this light, an International Marine Bioprospecting Authority had been earlier proposed. The present monograph examines the need for the proposed framework from an industrial and environmental perspective.

(Keywords: marine bioprospecting, marine policy, biodiversity, protection, environmental, genetic resources, intellectual property rights)

INTRODUCTION

One of the current topics of debate amongst the international marine policy makers, intellectual property rights (IPR) experts and environmentalist, is about the distribution of benefits to be had from the IPR rights of drugs and other bio-products from the seas and oceans worldwide. I have, in two of my earlier commentaries, contributed to this debate in a very modest way [1]. The formation of an 'International Marine Bioprospecting Authority', (IMBA) had been proposed. The case for a new international regime to equitably distribute the profits from marine genetic resources is becoming stronger as large multinational companies increasingly focus their attention on the seas to look for drugs and other beneficial goods from marine organisms [1-4]. The establishment of this authority is a possible answer to several very basic questions about the ownership of the marine genetic resources. The present monograph examines the need for the proposed framework from the industrial and environmental perspective.

DISCUSSION

The historical basis for claiming territorial seas was centered on security concerns [5]. Since the latter half of the twentieth century, economic concerns dominated security concerns. For example, while fishing rights, a very contentious issue, have been largely settled between nations (e.g. International Convention for the Regulation of Whaling, 1946, and the UN Agreement of Straddling and High Migratory Fish Stocks, 1995), much debate still continues over the sustainability of the international fishing stocks and the depletion of traditional fishing grounds of small time fishermen due to over-exploitation by mechanized trawlers and fish factories. Complex International Laws try to sort out these contentious issues [6, 7].

The seabed has also seen conflicts of interests between nations. Oil and gas reserves, particularly in regions where there are high stakes and many stakeholders, have either been resolved peacefully through treaties and negotiations like that in the North Sea, or have seen protracted military efforts like the one in the Persian Gulf. A conflict of interests in mining of the deep-sea nodules, another natural resource which does not belong to any nation in particular, has been resolved after much negotiation and has resulted in the formation of the International Seabed Authority [8].

Regulatory bodies are difficult to set up and costly to maintain, and the numerous bureaucratic bottlenecks of a regulatory body can slow development. However, in the case of the deep-sea mining at least, mining proved to be economically unviable and the technology for sustained mining activities was not available at

the time the regulatory body was set-up (no commercial mining activity has started yet) [9].

Thinking in the same line would suggest that it is premature to harmonize access and benefit sharing of marine genetic resources through the proposed IMBA. It is therefore pertinent to mention here that while commercial deep sea mining is yet to take off, marine bio-prospecting is very much viable and a reality. The interest in marine genetic resources is the last less explored frontier in the worldwide race for natural resources [10, 11]. Only the developed countries are well positioned and have capability and the expertise to carry out this techno-commercial pursuit [1]. Therefore, setting the rules of this worldwide search, where there is a large gap between the abilities of the contestants, should occur at the beginning of the pursuit, now, in a way that allows all of the contestants a fair share of the bounty.

The fundamental differences between marine bio-prospecting and mining of minerals (for example of the deep-sea nodules) are – there is usually no large-scale removal of genetic material from the seabed - samples only in the kilogram scale suffices so sustained efforts like those in mining are not required. The sample collection and recollection can take place in convenient schedules, may require no continuity of efforts, and most importantly, unlike mineral resources, genetic resources are regenerative. Being regenerative, however, does not provide a license for a large scale plunder, which is unacceptable [12], because, it would disturb the ecosystem and may even trigger unforeseen reactions in the complex and not well understood marine ecosystem.

Environmentalists and conservationists rightly protest against the removal of genetic-resources and it is only recently that marine genetic-resources have caught their attention [13]. It is in this context that it becomes necessary that an ecologically sustainable manner of sample collection and re-collection protocols could be followed in order to minimize damage to the marine ecosystem [14, 15]. The marine biodiversity databases thus created should be accessible to all. Giving out such knowledge in a 'free' manner would be counterbalanced by the monetary benefits that would accrue to the royalty pool by the users of such knowledge; namely the companies and national authorities that bio-prospect.

This framework should also be acceptable to industry as they will get free access with no up-front payments. Moreover, having to pay nothing for the sample collection initially would also remove the hindrance to the number of samples that they wish to screen. In principle the more samples that are screened, the greater the chance of getting a 'hit' or a drug lead. Therefore the principle of free access should act strongly in industry's favor and would more than offset the industry's 'perceived loss' in paying more royalties. The industry pays back only when a drug lead makes it to the market [16]. Until then, it has no liability to pay to the common royalty pool.

Strictly, the view from the industry could be limited to where they are allowed to bio-prospect and the royalties that they have to pay. But it is also true the industry/ state authority is carefully leafing through the results of the experiments, on which the natural marine laboratory in "no-mans-land" worked for millions of years. Therefore it is warranted to expect contributions from the marine bio-prospectors towards the benefit of human kind as a whole, and also to keep this natural marine laboratory working.

Marine biotechnology is a viable option for many drugs, which are difficult or uneconomical to synthesize [17, 18]. Particularly, for nutritional and food additives, marine bio-processing provides a ready alternative to conventional routes of chemical synthesis. Bio-prospecting would directly employ a large skilled and unskilled labor force. It would also generate employment opportunities through its logistics requirements and the associated drug discovery and development programs [19]. It could be envisaged from a Southern perspective that such related activities be preferably carried out in the Southern states itself (by the bio-prospector) rather than sending the samples for screening to developed countries. This would encourage the flow of related technology from the North to the South.

One strong point of this benefit-sharing scheme is that even landlocked nations would get a share of royalties. This is fair enough, since, even though they do not harbor any marine biodiversity themselves, they have a natural right to the genetic resources of the high seas, the 'common heritage of mankind' [20], that no country can claim as an exclusive right for themselves.

Southern nations could take a leading role. Amongst them are those nations that are technologically capable of bio-prospecting could help other nations in their neighborhood. This could promote regional 'South-to-South' co-operation and mutual trust.

CONCLUSION

There is little doubt now that the oceans have much to offer us through their biodiversity. We have now only to ensure that what it offers openly should be equitably distributed. Nations that are not only aware, but are also sufficiently sensitive to this issue, have to come forward in their own interest, to ensure that a fair institutional mechanism evolves to distribute the benefits of such global resources.

ACKNOWLEDGEMENTS

The author would like to acknowledge the Head of the Department of Applied Sciences and Humanities and the Dean of the Faculty of Engineering and Technology, MITS for their encouragement and support.

REFERENCES

1. Qanungo, K. 2008. "Equitable Sharing of Marine Genetic Resources". *Current Science*. 94(1): (9-10). <http://www.ias.ac.in/currsci/jan102008/8a.pdf> (Date accessed 22, May 2009). Qanungo, K. 2002. "Time for a New Deal in Marine Bioprospecting". *SciDev.Net*. <http://www.scidev.net/en/opinions/time-for-a-new-deal-on-marine-bioprospecting.html> (Date accessed, 22 May 2009).
2. United Nations. 2007. "An Update on Marine Genetic Resources: Scientific Research". June 2007. *Commercial Uses and a Database on Marine Bioprospecting, United Nations Informal Consultative Process on Oceans and the Law of the Sea Eight Meeting*. United Nations: New York, NY. 25-29 June 2007. (Date accessed, 19 May 2009). http://www.ias.unu.edu/resource_centre/Marine%20Genetic%20Resources%20UNU-IAS%20Report.pdf.
3. Zewers, K.E. 2008. "Debated Heroes from the Deep Sea - Marine Genetic Resources". *WIPO Magazine*. 2. http://www.wipo.int/wipo_magazine/en/2008/02/article_0008.html (Date accessed, 19 May 2009).
4. Glowka, L. 1998. *A Guide to Designing Legal Frameworks to Determine Access to Genetic Resources*. IUCN Environmental Law Centre: Switzerland.
5. United Nations. 2001. *Oceans and the Law of the Sea. The United Nations Convention of the Law of the Sea (A Historical Perspective) - Overview of Convention and Related Agreements*. United Nations, Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs: New York, NY. http://www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm (Date accessed, 2 May 2009).
6. Goldsmith, J.L., and Posner, E.A. 2005. *The Limits of International Law*. Oxford University Press: London, UK.
7. McLaughlin, R.J. 2003. "Foreign Access to Shared Marine Genetic Materials: Management Options for a Quasi-Fugacious Resource". *Ocean Development and International Law*. 34:297-348.
8. http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindxAgree.htm, <http://www.isa.org.jm/en/about> (Date accessed, 19 May 2009).
9. Chemistry World. 2007. "Treasures from the Deep". *Chemistry World*. <http://www.rsc.org/chemistryworld/issues/2007/january/treasuresdeep.asp> (Date accessed, 19 May 2009).
10. Pomponi, S.A. 1999. "The Bioprocess-Technology Potential of the Sea". *Journal of Biotechnology*, 70: 5-13.
11. McGlade, J. 2008. "Biodiversity and Marine Resources". May 14, 2008 speech Pre-COP 9 meeting, Bonn, Symposium II: Biodiversity: Functions and Uses. <http://www.eea.europa.eu/pressroom/speeches/biodiversity-and-marine-resources> (Date accessed, 19 May 2009).
12. Garson, M. 1997. "Marine Resources: Cure-All or Lose-All". *Nature Australia*. Autumn 1997.
13. Ascencio, A. and Bliss, M. 2008. "Conserving the Biodiversity of the High Seas and Deep Oceans: Institutional Gaps in the International System". <http://www.highseasconservation.org/documents/bliss-ascencio.pdf> (Date accessed, 19 May 2009).
14. Benkendorff, K. 1999. "Sustainable Bioprospecting". *Chemistry in Australia*. 66(9):14-16.
15. Benkendorff, K. 2002. "Potential Conservation Benefits and Problems Associated with Bioprospecting in the Marine Environment". In: *A Zoological Revolution: Using Native Fauna to*

Assist in its Own Survival. D. Lunney, and C. Dickman (eds). Royal Zoological Society of New South Wales and Australian Museum: New South Wales, Australia. 90-100.

16. For a related idea see, E. A. Evans-Illidge and P T Murphy. "A New Approach to Benefit Sharing in Bioprospecting". <http://www.cbd.int/doc/case-studies/abs/cs-abs-au.pdf> (Date accessed, 19 May 2009)
17. Fenical, W. 1997. "New Pharmaceuticals from Marine Organisms". *Trends in Biotechnology*. 15:339-341,.
18. Davidson, B.S. 1995. "New Dimensions in Natural Product Research". *Current Opinion in Biotechnology*. 6:284-29.
19. Qanungo, K. 2005. "Drugs from the Ocean Beds". *The Tribune*. <http://www.tribuneindia.com/2005/20051125/science.htm>
20. Frida, M. and Pfirter, A. 2008. "The Management of Seabed Living Resources". In: *The Area Under*. UNCLOS, Report Presented at the Tenth Session of the ISA. [http://www.Reei.Org/Reei%2011/F.Armas\(Reei11\).pdf](http://www.Reei.Org/Reei%2011/F.Armas(Reei11).pdf) (Date accessed, 19 May 2009)

ABOUT THE AUTHOR

Dr. Kushal Qanungo is an Assistant Professor in the Department of Applied Sciences and Humanities, MITS (Deemed University). His interests lie in chemistry, intellectual property rights, and environmental science.

SUGGESTED CITATION

Qanungo, K. 2009. "En Route to a New International Regime for Access and Benefit Sharing of Marine Genetic Resources". *Pacific Journal of Science and Technology*. 10(2):868-871.

 [Pacific Journal of Science and Technology](http://www.akamaiuniversity.us/PJST.htm)