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Biotechnology: Some Issues of General International Law*

Stephen McCaffrey**

“Not all tomatoes are equal.”

—Dr. Fred Gould¹

I. INTRODUCTION

“Biotechnology”—the term conjures up images of weeds run amok; of enormous, tasteless vegetables impervious to damage when packed beneath tons of their kind in shipping containers; of food that produces its own pesticides yet is safe to eat (or so we are told by the companies that produce it); and so on. On the other hand, the decent life that is beginning to become available to more than a tiny elite in the Western world is made possible in part by applied science and technology—including *biotechnology*. In particular, biotechnology may offer some hope to those developing countries that cannot afford the expensive pesticides and fertilizers that make much modern agriculture possible. Ideally, it could even render unnecessary some of the chemicals used in the rich countries of the North.²

However, the potential for biotechnology to cause harm raises the question of how it is regulated by international law. The range of international legal issues raised by biotechnology appears to be vast: from commercial concerns such as intellectual property rights,³ to issues about whether international trade law—whose chief purpose is to promote free trade—would prevent a country from banning the

* Based on papers delivered at a panel on *Genetically Modified Food: Friend or Foe?*, Int'l Law Weekend, New York (Nov. 6, 1999); and at the 19th Int'l Law Symposium, University of the Pacific, McGeorge School of Law (Mar. 25, 2000). The paper is generally based on the situation as of the Spring 2000, when it was written. However, some aspects of it have been updated as of January 2001.

** Distinguished Professor and Scholar, University of the Pacific, McGeorge School of Law. I am grateful for excellent research assistance provided by Laura Giuliani, University of the Pacific, McGeorge School of Law 2001, and Kimberly Allen, University of the Pacific, McGeorge School of Law 2001.

1. Carol Kaesuk Yoon & Melody Petersen, *Cautious Support on Biotech Foods by Science Panel*, N.Y. TIMES, Apr. 6, 2000, at A1, col. 4. Dr. Gould, of North Carolina University, sat on the 12-member panel that prepared a report for the National Academy of Sciences on Biotech Foods.

2. See Robert Paarlberg, *The Global Food Fight*, 79 FOREIGN AFFAIRS 24 (2000) (arguing that the benefits of genetically modified crops vastly outweigh their potential harms, and that the poor in the tropics desperately need the help of gene science); see also C. Ford Runge & Benjamin Senauer, *A Removable Feast*, 79 FOREIGN AFFAIRS 39 (2000) (arguing that rich countries must slash trade barriers and spread the biotechnology revolution to the poorest farmers who need it most); see also Paul Krugman, *Natural Born Killers*, N.Y. TIMES, Mar. 22, 2000, at A29, col. 5.

3. Private companies like Monsanto and DuPont did not begin making the large investments necessary to develop GM crops until the early 1980s, after the U.S. Supreme Court held that new types of plants and plant parts could be covered by patent protection. See *Diamond v. Chakrabarty*, 447 U.S. 303, 100 S.Ct. 2204 (1980) (holding that a human-made, genetically engineered bacterium capable of breaking down multiple components of crude oil is patentable). See generally Paarlberg, *supra* note 2, at 25.

import of genetically modified (GM) food; to questions about the right of a Western company to make millions, or even billions, from a drug derived from a tropical plant, without compensating either the country it came from or the person whose traditional knowledge led the company to acquire the plant in the first place; to some of the most fundamental human rights issues we can imagine, such as whether biotech companies are not engaging in a massive, ill-designed experiment on human subjects when they mix GM food with natural food and feed it to unknown, and unknowing, people. In the latter connection, experiments on human subjects without their consent have been prohibited since the Nuremberg Code in 1949,⁴ yet some observers believe that is precisely what is happening with GM food.⁵

What complicates things further is that the rules of international law must be applied to many different forms of genetically-engineered products: from pharmaceuticals made from samples taken in developing countries, to GM food, crops, and seeds. But in all of these cases we are dealing with products of “biotechnology”—a term the UN Convention on Biological Diversity defines as “any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.”⁶

In this Article I touch upon a few of the ways in which international law bears upon these new technologies. The Article begins with a few words of factual background. It then turns to legal issues, taking up first the combined effect of the “precautionary principle” and international trade law. It then examines the implications in this field of the International Law Commission’s work on “International Liability” and the obligation of prevention. Finally, the Article considers briefly the implications of obligations to future generations.

II. BACKGROUND

The *New York Times* series entitled *Redesigning Nature* includes a “special report” entitled *Reassessing Ecological Risks of Genetically Altered Crops*.⁷ The report examines the case of a genetically-engineered yellow crookneck squash that had been made resistant to two viruses that destroy the crop. Genetic engineering has also produced soybeans that are immune to the active ingredient in the agricultural weed killer Roundup, and both cotton and corn that contains a naturally occurring toxin (*Bacillus thuringiensis* or Bt) that acts as an insecticide.⁸

4. NUREMBERG CODE, paras. 1, 2, reprinted in 10 JUDGMENT, TRAILS OF WAR CRIMINALS BEFORE THE NUREMBERG MILITARY TRIBUNALS UNDER CONTROL COUNCIL LAW(1949). “The voluntary consent of the human subject is absolutely essential.” *Id.*

5. Daniel H. Derby, remarks at panel on *Genetically Modified Food: Friend or Foe?*, Int’l Law Weekend, New York (Nov. 6, 1999).

6. U.N. Convention on Biological Diversity, June 5, 1992, art. 2, 31 I.L.M. 818 (1992) [hereinafter CBD].

7. Carol Kaesuk Yoon, *Reassessing Ecological Risks of Genetically Altered Crops*, N.Y. TIMES, Nov. 3, 1999, at A1, col. 2.

8. Paarlberg, *supra* note 2, at 25.

The *Times* report notes that the U.S. Department of Agriculture (USDA) is “the primary agency responsible for assuring the ecological safety of [genetically modified] plants,” and points out that the USDA “has not rejected a single application for a genetically engineered crop.”⁹ Some scientists criticize these approvals on the ground that the Agency often relies on claims and studies conducted by the seed companies themselves.¹⁰

According to the report, USDA has set no scientific standards for evaluating the environmental safety of a genetically engineered plant.¹¹ The *Times* further states that rather than demanding specific experiments and data to establish safety, as is the case in other fields, the USDA “asks only that petitioners explain why the new plant is unlikely or likely to pose a number of broadly defined risks.”¹² But USDA officials defend their decisions, even while they “acknowledge that their system for weighing applications is evolving.”¹³

It is not only the USDA that is involved in this field.¹⁴ Two other federal agencies are at least potentially competent: the Environmental Protection Agency (EPA), which “regulates plants engineered to produce pesticides;”¹⁵ and the Food and Drug Administration (FDA), which, until recently, did not become involved unless it was requested to. Popular pressure seems to have forced the FDA to strengthen its oversight.¹⁶ However, it does not appear that the agencies have yet succeeded in coordinating their activities in this area, so that what regulation there is of genetically modified organisms (GMOs) is far from seamless. This is all the more alarming when one comes to realize how many different kinds of genes are used in biotechnology crops. “Since 1992, dozens of [these crops] have been approved for sale to American farmers and hundreds more are in the pipeline, with genes borrowed from every form of life: bacterial, viral, insect, even animal.”¹⁷

9. Yoon, *supra* note 7, at A1.

10. *Id.*

11. *Id.* at A22.

12. *Id.*

13. *Id.*

14. See Jonathan H. Adler, *More Sorry Than Safe: Assessing the Precautionary Principle and the Proposed International Biosafety Protocol*, 35 TEX. INT’LL.J. 173, 181-83 (2000) (discussing the regulation of biotechnology under U.S. domestic law).

15. *Id.* An example of such a plant is Bt corn.

16. The FDA’s former policy has been described as follows: the Agency “does not require engineered products to go through an approval process, but is available for consultations.” *Id.*; see also Yoon & Petersen, *supra* note 1, at A20 (stating that the FDA “recommends that companies developing biotech plants consult the agency on safety, but it does not require tests and largely allows the companies to police themselves.”). Public anxiety has forced a change in this policy. See Andrew Pollack, *F.D.A. Plans New Scrutiny In Areas of Biotechnology*, N.Y. TIMES, Jan. 18, 2001, at A10, col. 5 (reporting that the F.D.A. has proposed rules that would “make it mandatory, rather than voluntary, for developers of genetically modified food to subject such food to a safety review before bringing it to market. . . . But it declined requests from numerous consumer and environmental groups that it require all genetically engineered foods to be labeled.”).

17. See Yoon, *supra* note 7, at A1.

Farmers have embraced these products¹⁸ to the extent that biotech seeds are used in plants that produced twenty to forty-five percent of the corn, soybean, and cotton produced in the United States in 1999 (although the experience with StarLink corn has had a chilling effect on the use of GM seeds¹⁹). Thus “[m]ost Americans have probably eaten some food made with genetically modified soy or corn.”²⁰ Seed and chemical companies stand to make huge profits from these new products. So much so that one lawsuit, filed against Monsanto by six farmers in December 1999, charges that the Company rushed to market genetically engineered seeds without conducting adequate tests as to their safety.²¹

I turn next to some of the international legal issues that may arise with regard to biotechnology. A logical starting place is the Convention on Biological Diversity.

III. SOME RULES AND PRINCIPLES OF INTERNATIONAL LAW²²

A. *The Biological Diversity Convention and its Biosafety Protocol*

The United Nations Convention on Biological Diversity (Convention or CBD) was concluded at the Earth Summit in Rio de Janeiro in 1992.²³ Its stated purpose is to conserve and sustainably use biological “diversity.”²⁴ Without getting into specifics of the Convention, it seems obvious the development and use of biologically engineered crops could threaten biological diversity rather than promote it—in the same way that exotic species do.²⁵ Indeed, the CBD anticipated this problem, and calls upon the parties not only to address it domestically,²⁶ but also to:

consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism

18. See, e.g., David Barboza, *In the Heartland, Genetic Promises*, N.Y. TIMES, Mar. 17, 2000, at C1, col. 2.

19. See David Barboza, *Gene-Altered Corn Changes Dynamics of Grain Industry*, N.Y. TIMES, Dec. 11, 2000, at A1.

20. Yoon, *supra* note 7, at A1.

21. David Barboza, *Monsanto Sued Over Use of Biotechnology in Developing Seeds*, N.Y. TIMES, Dec. 15, 1999, at C1, col. 2; see also David Barboza, *Biotech Companies Take On Critics of Gene-Altered Food*, N.Y. TIMES, Nov. 12, 1999, at C1, col. 1.

22. For a discussion of the (lack of) international regulation of biotechnology, see Adler, *supra* note 14, at 183-88.

23. CBD, *supra* note 6, 31 I.L.M. 818.

24. *Id.* at 823.

25. See John Ntambirweki, *Biotechnology and International Law Within the North-South Context*, 14 TRANSNAT'L. LAW. 103, this issue (giving some examples of this phenomenon).

26. CBD, *supra* note 6, art. 8, 31 I.L.M. at 826. Article 8(g) of the CBD calls on parties to: “Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health . . .” *Id.*

resulting from biotechnology that may have adverse effect [sic] on the conservation and sustainable use of biological diversity.²⁷

Therefore, an attempt was made to conclude a biosafety protocol to the Biodiversity Convention—an effort that, after first self-destructing in Cartagena, ultimately bore fruit in Montreal in January 2000 in the form of the Cartagena Protocol (Protocol).²⁸ While these negotiations would seem to have presented an opportunity to craft a comprehensive international regime governing the problem, this was not to be. Because of the strong positions taken by the so-called “Miami Group,” composed of the six major GM exporting countries,²⁹ the Protocol deals only with a small portion of the problem, namely, that posed by trade in so-called “living modified organisms” or LMOs. It thus tracks quite strictly the CBD’s injunction, quoted above. LMOs are chiefly seeds, but may also take the form of certain food or feed.³⁰ According to some commentators, the Protocol does not even do a very good job of controlling the risks associated with these organisms.³¹ In any event, it postpones entirely the question of liability for harm resulting from the transboundary movement of LMOs.³²

Not only is the Protocol limited in scope to LMOs, its basic approach to controlling the transboundary movement of those organisms—the “advanced informed agreement” (AIA) procedure, discussed further below—does not apply to agricultural commodities. Thus, genetically engineered food, perhaps the chief concern of the public, is not subject to an AIA requirement. The issue of what sort of regime should apply to these commodities was highly contentious in the negotiations. The Miami Group was concerned that they not be subject to approval on a shipment-by-shipment basis. In the end, that position prevailed. A compromise was reached which exempted agricultural commodities from the AIA requirement³³ and instead created special rules for LMOs intended for direct use as food or feed, or for processing (LMO FFPs).³⁴ Rather than requiring notification of each intended transboundary movement, as must occur for other LMOs, these rules envision the

27. *Id.* art. 19(3), 31 I.L.M. at 830. Article 19 is entitled, “Handling of biotechnology and Distribution of its Benefits.”

28. Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Jan. 29, 2000, 39 I.L.M. 1027 (2000) [hereinafter Biosafety Protocol]. The Protocol may be downloaded from the Biosafety Homepage, at www.biodiv.org/biosafety/protocol.asp (last visited Feb. 26, 2001).

29. The “Miami Group” is composed of Argentina, Australia, Canada, Chile, the United States, and Uruguay. See generally Peter-Tobias Stoll, *Controlling the Risks of Genetically Modified Organisms: The Cartagena Protocol on Biosafety and the SPS Agreement*, [1999] 10 Y.B. Int’l Envtl. L. 82, 87 (2000) (discussing the positions of the different groups).

30. Biosafety Protocol, *supra* note 28, art. 11, 39 I.L.M. at 1031-32.

31. See, e.g., Stoll, *supra* note 29, at 83 (“[T]he Biosafety Protocol’s ability to control the risks associated with LMOs is questionable, given the many legal uncertainties that states will face when applying it.”).

32. Biosafety Protocol, *supra* note 28, art. 27, 39 I.L.M. at 1039.

33. *Id.* art. 7(2), 39 I.L.M. at 1030. Article 7(2) provides that LMO FFPs are not considered LMOs exported for “intentional introduction into the environment” and are thus not covered by the AIA procedure. *Id.*

34. *Id.* art. 11, 39 I.L.M. at 1031-32.

use of an internet-based clearinghouse procedure. The procedure requires exporting state parties to communicate to other parties, through the Biosafety Clearing-House,³⁵ decisions regarding the domestic use—“including placing on the market”—of LMO FFPs. Potential importing states may then decide whether to permit the import of an LMO FFP on the basis of their domestic law, provided it is consistent with the Protocol’s basic objective.³⁶ These domestic law provisions concerning LMO FFPs are likewise to be communicated to other parties through the clearinghouse. The resulting transparency is doubtless a good thing, but the lack of a shipment-by-shipment consent requirement, which is applicable to other LMOs, is likely to give rise to criticism.

The Biosafety Protocol’s procedural mechanism for the control of transboundary movements of LMOs is denominated by the AIA procedure, in accordance with the terminology of the above-quoted provision of the CBD.³⁷ AIA is based on the idea of prior informed consent (PIC), which is the basic principle that has been accepted since the late 1980s with regard to transboundary movements of hazardous waste³⁸ and since the late 1990s for trade in hazardous chemicals.³⁹ The AIA procedure under the Protocol is generally congruent with PIC under other agreements, but contains more specific and detailed time periods for decision making.⁴⁰

This and other aspects of the Biosafety Protocol to be discussed below may be considered advances, but they remain empty rhetoric if they are not accepted by the principal actors in the GM field. One of those is the United States, which is not yet a party to the CBD, and though it participated actively in the Biosafety negotiations, did so only as an observer. It is hoped that the United States will join both agreements, and sooner rather than later. But until it does, its activities in this field will be governed only by the treaties to which it is a party and by general international law.⁴¹ Let us then look at some of those sources of obligation. I will

35. See Stoll, *supra* note 29, at 88 (explaining this clearinghouse will form part of the clearinghouse mechanism that already exists under the CBD).

36. Biosafety Protocol, *supra* note 28, art. 11(4), 39 I.L.M. at 1032. Article 1 provides: “[T]he objective of this Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.”

37. See CBD, *supra* note 6, art. 19(3), 31 I.L.M. at 830 (also using the expression “living modified organism”).

38. Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal, Mar. 22, 1989, 1673 U.N.T.S. No. 28911, 28 I.L.M. 649 (1989).

39. Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Sept. 11, 1998, 38 I.L.M. 1 (1999). See generally Katharina Krummer, *Prior Informed Consent for Chemicals in International Trade: The 1998 Rotterdam Convention*, 8 REV. EUR. COMM. & INT’L ENVTL. L. 322 (1999).

40. See Biosafety Protocol, *supra* note 28, art. 10, 39 I.L.M. at 1031.

41. *Id.* art. 24, 39 I.L.M. at 1038. Transboundary movements from states that are parties to the Biosafety Protocol to those that are not parties are governed by Article 24 of the Biosafety Protocol, which provides that movements between parties and non-parties “shall be consistent with the objective of this Protocol.”

first take up the “precautionary principle” and its relationship with international trade law.

B. The Precautionary Principle and International Trade Law

Principle 15 of the Rio Declaration on Environment and Development reads as follows:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.⁴²

This formulation of what Principle 15 refers to as the precautionary “approach” is a watered-down version of the “precautionary *principle*” which has been accepted in many international instruments and fora—including the preamble of the CBD itself—but which the United States found hard to swallow without altering some of its fundamental characteristics. Thus, Principle 15 speaks of a precautionary “approach” rather than a “principle.” The U.S. determination to avoid use of the term “principle” presumably springs from a fear that this term would connote a recognition that the text had some normative force; not necessarily that caution was required by international law under the specified circumstances, but even that there was a moral obligation to exercise it. Thus, the question arises: How does the precautionary approach of the Biosafety Protocol square with the precautionary principle?

Principle 15 expresses the idea that a country should exercise caution in the face of scientific uncertainty and, provides that preventive measures must be “cost-effective,” whatever that may mean in the context of possibly “serious or irreversible damage.” The Rio Declaration version of the principle, or approach, is referred to expressly in both the Preamble and Article 1 of the Biosafety Protocol, indicating that, at least for the purpose of LMOs, this version of the principle has prevailed over the purer form contained in the CBD’s preamble.⁴³ That having been said, the Protocol does take what may generally be described as a precautionary approach, both by giving pride of place to the idea of precaution⁴⁴ and by “build[ing]

42. United Nations Conference on Environment and Development, Rio Declaration on Environment and Development, June 14, 1992, U.N. Doc. A/CONF.151/5/Rev.1 (1992), *reprinted in* 31 I.L.M. 874 (1992).

43. “*Noting also* that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat . . .” CBD, *supra* note 6, pmb1, 31 I.L.M. at 822.

44. Biosafety Protocol, *supra* note 28, pmb1., art. 1, 39 I.L.M. at 1027, 1027 (referring to the “precautionary approach”).

it directly into the operative provisions on risk assessment.”⁴⁵ However, the risk management provisions authorize precautionary action only if the scientific uncertainty concerns the “extent” of the potential adverse effects of LMOs. Unless interpreted otherwise by the parties, this requirement would significantly narrow the effectiveness of the provisions on precaution. As one commentator has observed, “[I]n the case of the risks associated with LMOs, it is uncertain[ty] regarding the if and how, rather than the extent, of the risk, that is likely to be primarily at stake.”⁴⁶

In any event, at least as of Spring 2000, the United States did not seem to be complying with the principle, or “approach,” even in its rather emasculated form. The USDA admitted that its system for evaluating applications for genetically engineered plants was still “evolving.” It accepted studies by the proponent of the new plant, and those studies are often—even in the most critical cases—sub-par. For example, in the crookneck squash case, only fourteen of the weeds related to the proposed squash were actually studied to determine whether its population would be kept in check by the virus that the new plant would be immune to—an immunity that could spread from the new, supersquash to the weeds, making them superweeds.⁴⁷ As one scientist observed, the fact that none of the weeds studied had the virus could just as well be due to the virus having wiped out all the weeds it had encountered. If so, the spread of the immunity from the new squash to the weedy cousin would be a real problem. In fact, the National Academy of Sciences (NAS) found that the USDA did not have an adequate scientific basis for its approval of the squash.⁴⁸ In what some would consider to be an understatement, one member of the NAS panel opined that: “There needs to be some caution here.”⁴⁹

But the big question in terms of trade in GMOs is who should bear the burden—i.e., the burden of showing whether the GMO in question is dangerous to human health⁵⁰ or the environment. Specifically, should the country exporting GMOs have to establish that they are safe or at least that they do not pose unacceptable dangers? Or must the importing country do so before it will be allowed to keep them out? It may be very difficult to carry this burden because the precise risks posed by most GMOs are not fully understood. Allocation of the burden may therefore determine whether the GM goods move across borders or not. International trade law would put the burden on the importing state to establish that it was justified in excluding the GMOs on the basis of one of the exceptions in Article XX

45. Stoll, *supra* note 29, at 97 (referring to the Biosafety Protocol, Annex III, sec. 4, arts. 10(6), 11(8)).

46. Stoll, *supra* note 29, at 116.

47. However, a recent study on the competitive abilities of various strains of GM plants concluded that, “far from marching like weeds over the countryside around their planting sites, the crops in question tended to curl up an die in the face of competition from wild species.” *Genetically Modified Weaklings*, THE ECONOMIST, Feb. 10, 2001, at 79. But this finding does not imply that GM crops are environmentally safe in all respects.

48. Yoon & Petersen, *supra* note 1, at A20.

49. *Id.*

50. The health issue is the one about which the public, especially in Europe, seems most passionate at present. See, e.g., Donald G. McNeil, Jr., *Protests on New Genes and Seeds Grow More Passionate in Europe*, N.Y. TIMES, Mar. 14, 2000, at A1, col. 1.

of the General Agreement on Tariffs and Trade, 1994 (GATT 1994)⁵¹ to the prohibition of quotas under Article 11 of that Agreement—or, as to health concerns, on the basis of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).⁵²

In the WTO *Beef Hormones* case, the Appellate Body held that an importing country could apply a standard that is higher than the international standard if there is *any* scientific evidence that provides a *rational basis* for the import prohibition in question. As is now well known, the EU was unable to adduce even that level of evidence in the *Hormones* case; it is likely that it would be equally unable to demonstrate risks to human health from GMO crops.

It may be that the ultimate solution will lie in a compromise similar to the one that seems to be taking shape between the UK and France over British beef.⁵³ Under this approach, France would agree to allow the beef to be imported subject to increased safety measures, such as the traceability of cattle, increased testing for mad cow disease, and meat labeling.⁵⁴ It would seem that similar measures could be taken with regard to GMOs.

I would now like to turn to international liability and the principle of prevention of harm. Specifically, the question arises: Is this new regime for trade in certain types of biotechnology compatible with trade/SPS agreements and, more generally, with the precautionary principle and general principles of international law concerning transboundary harm?

C. “International Liability” and Prevention

In 1978, the International Law Commission of the United Nations (Commission or ILC) began work on a topic with an extraordinarily unwieldy name: International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law.⁵⁵ This work has been controversial, mainly because states are not ready for strict liability. So, rather than focusing on liability, *per se*, the Commission took a new tack: it shifted the focus from liability to prevention. This approach allowed the ILC to adopt in 1998—twenty years after it began work on Liability—a set of Draft Articles on the sub-topic of “Prevention of Transboundary Damage from Hazardous Activities.”

51. General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, art. XX, Marrakesh Agreement Establishing the World Trade Organization, Annex IA, 33 I.L.M. 1226 (1994).

52. Agreement on the Application of Sanitary and Phytosanitary Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex IA, 33 I.L.M. 1226 (1994). *See* Stoll, *supra* note 29, at 114-19 (discussing the relationship between the SPS Agreement and the precautionary principle). Particularly, the author observed that “it remains to be seen whether a state can safely undertake [precautionary] measures in the case of a lack of scientific evidence” and still be in compliance with the SPS Agreement. *Id.* at 114.

53. As of early 2000.

54. N.Y. TIMES, Nov. 5, 1999, at A6, col. 2.

55. [1978] 2 Y.B. Int’l L. Comm’n 149, pt. 2. Before beginning work on the subject, the Commission sometimes referred to it as “responsibility for risk.” *See, e.g.*, [1973] 2 Y.B. Int’l L. Comm’n 169, para. 39.

Article 1 of those Draft Articles, which defines their scope, provides that they apply to “activities not prohibited by international law which involve a risk of causing significant transboundary harm through their physical consequences.”⁵⁶ “Transboundary harm” is defined as “harm caused in the territory of or in other places under the jurisdiction or control of a State other than the State of origin, whether or not the States concerned share a common border”⁵⁷ This would seem to cover comfortably the kinds of activities and resulting harm that are involved in the transboundary movement of GMOs.

The basic obligation of the Draft Articles is contained in Article 3, which simply provides that, “[s]tates shall take all appropriate measures to prevent, or to minimize the risk of, significant transboundary harm.”⁵⁸ Are GMO-exporting states doing this now?⁵⁹ It is difficult to answer this question on the basis of the information that is available. But as concerns the United States, based on media reports which suggest a rather passive attitude on the part of U.S. regulatory agencies, I would have to answer that it does not appear that the United States is in fact “tak[ing] all appropriate measures” to prevent or minimize the risk of significant transboundary harm from GMOs. The Biosafety Protocol calls as it does for a “risk assessment to be carried out prior to the first release” of an LMO.⁶⁰ Notification through the AIA procedure and related precautionary measures would seem to satisfy this requirement. But again, the United States has neither signed nor ratified the Protocol.

The ILC’s Draft Articles also call for impact assessment in relation to activities to which they apply;⁶¹ provision of information to the public likely to be affected by those activities and the ascertainment of their views;⁶² provision of notification to states likely to be affected by activities entailing a risk of transboundary harm;⁶³ and consultations between the state of origin and states likely to be affected “with a view to achieving acceptable solutions regarding measures to be adopted in order to prevent, or to minimize the risk of, significant transboundary harm.”⁶⁴ In the latter consultations, the states concerned are to “seek solutions based on an equitable

56. *Report of the International Law Commission on the Work of Its Fiftieth Session*, 53 U.N. GAOR, Supp. No. 10, at 18, U.N. Doc. A/53/10 (1998), available at <http://www.un.org/law/ilc/reports/1998/98repfra.htm> (last visited May 10, 2001) [hereinafter *1998 ILC Report*].

57. *Id.*

58. *Id.* at 19.

59. Again, this question is asked (and answered) as of early 2000. As of February 2001, the EU was preparing to end its unofficial moratorium on bioengineered seeds and food. On February 14, 2001, the EU Parliament adopted, by a vote of 338-52, a measure establishing strict new controls governing “the testing, planting and sale of crops and food for humans and animals and the testing and sale of pharmaceuticals.” Donald G. McNeil, Jr., *Europe Approves Strict Food Rules*, N.Y. TIMES, Feb. 15, 2001, at A1; see also *European Union Reaches Agreement Regulating GMO Releases Into Environment*, 24 INT’L ENVTL. RPTR. 5 (2001).

60. Biosafety Protocol, *supra* note 28, art. 16(3), 39 I.L.M. at 1034.

61. *1998 ILC Report*, *supra* note 56, art. 8 at 20.

62. *Id.* art. 9 at 20.

63. *Id.* art. 10 at 20.

64. *Id.* art. 11 at 21.

balance of interests”⁶⁵ While the factors to be taken into account in achieving such a balance do not expressly mention precaution, they do mention risk.⁶⁶ Further, the Commission’s commentary to Article 3 refers specifically to Principle 15 of the Rio Declaration, discussed above, in explaining the kinds of measures that may be necessary to prevent or minimize the risk of causing significant transboundary harm.⁶⁷ This suggests that the ILC has a precautionary approach in mind; an approach that would be required in cases involving a risk of serious transboundary harm by what seems to be an emerging norm of customary international law.

But apart from the ILC’s Articles, it is clear that there is an obligation under customary international law to prevent transboundary environmental harm. The obligation was famously stated in the *Trail Smelter* arbitration,⁶⁸ enshrined in both Principle 21 of the 1972 Stockholm Declaration⁶⁹ and Principle 2 of the 1992 Rio Declaration,⁷⁰ reiterated in Article 3 of the CBD,⁷¹ and recognized in recent opinions of the World Court, including: the Court’s Advisory Opinion in the *Threat or Use of Nuclear Weapons* case,⁷² and its judgment in the *Gabčíkovo-Nagymaros* case between Hungary and Slovakia.⁷³ So, the question is not as to the principle itself, but as to precisely how it applies to GMOs. This could perhaps be the subject of a separate law review article.

My conclusion is that, whether or not the ILC’s Draft Articles were intended to apply to this kind of situation, it seems to me they should apply, and indeed the principles they are based on probably do apply in large measure as a matter of customary international law.

D. Obligations to Future Generations

In view of the risks biotechnology involves, it seems clear that we should bear in mind the consequences for future generations of using GM plants in the face of scientific uncertainty so that we can “have it all now.” The concept of intergenerational equity⁷⁴ teaches that, in John Locke’s words, we should leave “as

65. *Id.* art. 11(2) at 21. Article 12 sets forth a non-exhaustive list of factors to be taken into account in achieving an equitable balance of interests. *Id.* art. 12 at 21.

66. *Id.* art. 12(c), at 21.

67. *Id.* at 37.

68. 3 U.N. REP. INT’L ARB. AWARDS 1911, 1938 (1941), reprinted in 35 AM. J. INT’L L. 684 (1941).

69. Stockholm Declaration on the Human Environment, U.N. Doc. A/CONF.48/14/Rev.1, at 3 (1973), reprinted in 11 I.L.M. 1416 (1972).

70. Rio Declaration on Environment and Development, June 13, 1992, U.N. Doc. A/CONF.151/5/Rev.1, reprinted in 31 I.L.M. 874 (1992).

71. CBD, *supra* note 6, art. 3, 31 I.L.M. at 824.

72. Legality of the Threat or Use of Nuclear Weapons, 1996 I.C.J. 241-42, para. 29 (Advisory Opinion).

73. Case concerning the Gabčíkovo-Nagymaros Project (Hung. v. Slov.), 1997 I.C.J. 38, para. 53.

74. See generally EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY AND INTERGENERATIONAL EQUITY (1989); see also *Intergenerational Equity: A Legal Framework for Global Environmental Change*, in ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW 385 (E. Brown Weiss ed. 1992).

much, and as good, for others.” The question is whether using GM plants as recklessly as we seem to be using them now will not impair the gene bank and, perhaps less abstractly, the available foods, for our successors. To put it another way—one that is perhaps more familiar to the first-year Property student—are we not committing biological “waste” by risking the depletion of the genetic “freehold” and exposure of what remains of the gene pool to predators and diseases?

IV. CONCLUSIONS

In short, my conclusions are as follows: We know there are potential problems; we need more knowledge; we should proceed cautiously; we should develop a tighter regulatory scheme; international trade law should, and apparently does, permit countries to exclude GM food as to which they can make a prima facie showing that it may be dangerous. Let us hope that commercial considerations do not blind us to a proper, far-sighted approach to managing the risks associated with biotechnology.