DEVELOPING COUNTRIES AND THE RIGHT TO INFORMED DECISION-MAKING: FAILURES OF THE CARTAGENA PROTOCOL ON BIOSAFETY

by

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ABSTRACT

The international community has recently responded to the need for an instrument that regulates the rapidly evolving world of agricultural biotechnology. After four difficult years of negotiation, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity was adopted in January 2000. This agreement regulates the transboundary transfer of genetically modified organisms intended for human consumption, animal feed, processing and introduction into the environment. The Protocol entered into force on September 11, 2003 and now has 125 state Parties.

The Protocol was an initiative of developing countries. Yet this thesis argues that the Protocol does not adequately address developing country concerns because the mechanism of informed decision-making upon which it is based is flawed. The Protocol adopts a narrow conception of developing country interests and, as a consequence, provides inadequate information and insufficient decision-making powers to decision-makers in importing (primarily developing) states.

This thesis elaborates upon developing country interests and outlines some of the cultural, social, economic and historical grounds upon which they are based. Primarily, this involves a consideration of developed country policies that have impacted food security in the developing world and have played a role in shaping developing country attitudes toward agricultural biotechnology.

Developing country concerns and interests are also outlined in a detailed negotiating history of the Protocol. This history focuses on the divergent attitudes of developed and developing countries and the significant conflicts that arose between these
two groups of states. The manner in which these conflicts are reflected in the final text is also investigated.

Finally, this thesis provides a critique of the Protocol with a particular focus on the role of informed decision-making within the agreement. Although informed decision-making should serve as the foundation of the Protocol, this principle was significantly eroded in the final text of the agreement. Importing (primarily developing) states are provided with inadequate information and insufficient decision-making powers. Informed decision-making is constrained to such an extent as to make it ineffective as a legal regulatory mechanism.
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"I have heard... that people may become dependent on us for food. I know this is not supposed to be good news. To me that was good news, because before people can do anything they have got to eat. And if you are looking for a way to get people to lean on you and to be dependent on you, in terms of their cooperation with you, it seems to me that food dependence would be terrific."

Senator Hubert Humphrey

"For me, the topic of biosafety in international law remains a case of deception and deceit, where the powerful interests of a few have prevailed over the interests of humankind at large, and, what is worse, with the connivance and complicity of most of the world's governments... My concern has to do with some more fundamental ethical considerations regarding the trend in the contemporary development of international law in this field, or rather the lack of such development. This lack of development results from the overruling of the slightest modicum of basic human consideration for the social victims, particularly in developing countries, in favour of the commercial interests of the largest and most powerful corporations in the world."

Ambassador Alberto Szekely of Mexico

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CHAPTER I - INTRODUCTION AND OVERVIEW

I. Introduction

Over the course of the past decade, the international community has begun to wrestle with the challenge of regulating the rapidly evolving world of modern biotechnology. The development of technology that enables the creation of genetically modified organisms (GMOs) provides countless opportunities. Scientists have been able to engineer insects incapable of transmitting malaria, plants that produce edible insulin, vitamin-enhanced rice and herbicide-resistant plants. These innovations create a web of ethical, social, environmental and economic issues that poses a significant obstacle to the implementation of a legal regulatory regime.

The challenge of regulation is all the more difficult in an international forum for several reasons. First, although viewed primarily as an environmental issue, there are a range of legal disciplines that impact upon the regulation of GMOs including trade, intellectual property and human rights. Second, the issue of biotechnology is significantly different than other environmental issues addressed in multilateral agreements. Biotechnology can be viewed as both a source of environmental harm and a mechanism of reducing environmental degradation. Biotechnology both threatens, and seeks to protect, biodiversity. This paradox creates a difficult foundation upon which a regulatory regime must be built. Finally, the development of GMOs has generated a contentious and polarized debate among scientists, citizens, non-governmental organizations, scholars and governments across the globe. The divergence in opinion is

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3 This term is described in greater detail in Chapter 2.
evidenced by the current biotech trade war between the United States and the European Union (EU) and the controversy caused by rejection of U.S.-sourced GM food aid by several African nations.

In view of these obstacles, the negotiation of the *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*\(^5\) is viewed by many as a laudable accomplishment. The multilateral agreement, which took more than five years to negotiate, entered into force in 2003 and now has more than 1200 parties. Its objective 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.”\(^6\) In this way, the *Protocol* provides some form of regulation over the trade and environmental implications of modern biotechnology.

Despite the many achievements of the *Protocol*, a close examination of its text and a consideration of the many issues that arose during the negotiation raise questions about the potential efficacy of the agreement. What was the impetus for the *Protocol* and has it been addressed? To what extent have the objectives of each of the negotiating blocs been satisfied and at what cost? Whose needs should be prioritized where conflict arises and is this reflected in the *Protocol*? What implications arise from the fact that exporting states will provide information to and help build capacity in importing states? This thesis attempts to answer these questions and to critically appraise the *Protocol* from a theoretical perspective that draws on alternative development theory and science and technology studies. Before that perspective is outlined, however, this chapter provides an

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overview of the mechanisms and provisions of the agreement and a summary of the
literature that exists on the Protocol to date.

II. Overview of the Protocol

Despite the complex issues it seeks to regulate, the Protocol is a relatively
straightforward agreement that encompasses a preamble, forty articles and three annexes. Although the Protocol regulates some aspects of domestic handling and use of GMOs, its primary focus is on transboundary movements. The Protocol provides for a variety of procedures and mechanisms with the aim of ensuring the safe transfer of GMOs from one Party to another.

The agreement encompasses two categories of GMOs (referred to as living modified organisms (LMOs) throughout the Protocol)\(^7\): those intended for intentional introduction into the environment (e.g. seeds or fish) and those intended for direct use as food, animal feed, or for processing (e.g. fruit or grains). Different mechanisms regulate the transboundary transfer of these two groups, although both are premised on the notion of informed consent which serves as the hallmark of the Protocol.

The Protocol requires exporting Parties to provide notice of a transboundary movement and to share information regarding the characteristics, risks, intended use and methods for safe handling of LMOs being transferred from their jurisdiction to an importing Party. Depending on the category of LMO, this information is provided either directly to the Party of import or to an Internet-based mechanism called the Biosafety Clearing-House (BCH). After the receipt of this information, a Party of import may make a decision denying or permitting the movement of LMOs into its territory. The

\(^7\)The reasons for this will be explained in Chapter 3.
the potential adverse effects of an LMO on biodiversity will not preclude a Party from denying importation. The agreement also gives Parties the right to consider socioeconomic impacts of LMOs when making decisions, although this right is constrained to a large extent.

Although the transboundary transfer procedures serve as the core of the Protocol, many of the other provisions of the agreement play a significant role in advancing the Protocol’s objective. Parties have obligations regarding risk management within their own jurisdictions, including the adoption of procedures to deal with unintentional and illegal transboundary transfers of LMOs. Risks identified by exporting Parties must also be managed with appropriate strategies within the importing state.

In addition to the information-share requirements that are part of the transboundary transfer mechanisms, Parties are encouraged to exchange other forms of information to assist with implementation of the agreement. The BCH is intended to facilitate the exchange of scientific, environmental and legal information on LMOs from countries with biotech capabilities and experience to those without. Parties are also encouraged to research and to share information regarding socioeconomic impacts of LMOs. Finally, the Protocol provides for the development of capacity-building programs in order to assist with implementation of the agreement in developing country Parties. A financial mechanism is provided for in the Protocol that relies upon the institutional structure established under the Convention on Biological Diversity.8

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8 5 June 1992, 31 I.L.M. 808 (29 December 1993) [Convention]. The relevant institution is the Global Environment Facility (GEF).
III. Literature Review

Given that the Protocol came into force only two years ago, it is not surprising to find relatively little commentary about the Protocol’s content and potential impact. Nonetheless, it is apparent that certain perspectives have been adopted and certain presumptions have been made in existing analyses of the agreement. On this basis, one can discern several different approaches that have been adopted in commentary about the Protocol.

The first approach incorporates a skeptical view of the Protocol’s utility and a superficial consideration of developing country interests. Within this collection, three different viewpoints predominate: a focus on how the Protocol undermines liberalized trade; a view that the merits of the Protocol can be determined by balancing the environmental benefits of biotechnology against the environmental hazards it poses; and a paternalistic attitude toward the issue of biotechnology use in developing countries.

The second approach is more analytical and focuses primarily on the trade implications of the agreement. Most often, this involves a consideration of the relationship between the Protocol and the agreements of the World Trade Organization (WTO). Although there is some recognition in this writing that the risks of biotechnology are uncertain, vary from place to place, and may encompass socioeconomic impacts, the interests of developing countries are not considered in any significant detail. Rather, the writing here focuses primarily on the conflict between and differing perspectives of the EU and the U.S.

Finally, the last approach places a greater emphasis on the interests of developing countries in the development and implementation of the Protocol. One group of writers focuses on the interaction between the governance of biotechnology and the process of
globalization. Another commentator examines the competing norms of governance within the Protocol.

A. Skeptical Views of the Protocol

i. Liberalized Trade Regime

Within the first approach, writers advance the argument that the Protocol may undermine the values of a liberalized trade regime. These writers raise the concern that environmental protectionism under the Protocol will be used as a guise for trade protectionism.\(^9\) Accordingly, the precautionary principle embedded in the Protocol is viewed as unnecessary\(^10\) and an unwelcome threat to the values underlying a free market.\(^11\) Commentators argue that the trade of GMOs would be better dealt with under the auspices of the WTO,\(^12\) specifically the *Agreement on the Application of Sanitary and Phytosanitary Measures*.\(^13\) This would ensure that an international body, akin to the bodies relied on under the WTO agreements in establishing standards for food and health, would provide impartial decisions regarding GMOs based soundly in science.\(^14\) The implications of removing decision-making power from individual states, familiar with their own technological and institutional capacities, to a technical body of experts imposing universal standards are not discussed.

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\(^12\) Jacob, *supra* note 10.


\(^14\) Katz, *supra* note 9 at 978-979, 981.
In addition to fears about protectionism, commentators argue that the precautionary principle is at odds with the general principles that guide a free market system. One concern is that, “[c]ontrary to the allocation of the burden of proof among parties in a free market,” the precautionary principle places the burden of proof on “the party attempting to introduce a new product into the market.”¹⁵ The precautionary principle might restrict market access and eliminate any incentive for the development of “technological advancements.”¹⁶ In this way, it is argued, the precautionary principle serves to impede the environmental progress possible through the application of biotechnology.

ii. Balancing Environmental Benefits and Risks

The balancing of environmental risks against benefits is used by commentators as a basis upon which to evaluate aspects of the Protocol, most commonly the ability of individual states to reject the importation of LMOs into their territory.¹⁷ These analyses ignore the socioeconomic and cultural factors that may serve as barriers to achieving the benefits of LMOs in any particular state or region and presume that the potential risks of LMO use are universal. By way of example, the particular environments, scientific capacities or infrastructure of states are not addressed as variables in these discussions.

Commentators argue that the benefits of GMO use outweigh the risks and use this as another line of attack on the precautionary nature of the Protocol.¹⁸ One writer argues that the version of the precautionary principle included in the Protocol is simply too

¹⁶ Ibid.; Katz, supra note 9 at 965; Adler, “Biosafe or Bio-Sorry”, supra note 9 at 174.
¹⁷ See e.g. Adler, “Biosafe or Bio-Sorry”, ibid. at 771.
¹⁸ Ibid. at 774; Katz, supra note 9 at 951.
stringent given the potential environmental effects of GMO use. Another writer notes that the adoption of the precautionary principle “is an overreaction to the public’s resistance to GMOs, which is a result of the public’s distrust of science.” Moreover, it is argued that any risks can be managed with appropriate technology and should not impede the use of biotechnology to achieve laudable environmental goals. By focusing on risks posed by new technologies, it is argued, the risks that arise by failing to introduce new technologies are ignored. Developing countries, for example, are said to have “justified restrictions on the transboundary movement of genetically engineered crops” without paying much attention to the harm that will result from increasing the amount of land planted with low-yielding crops.

iii. Paternalism

The Protocol was an initiative of developing countries, who advocated a strongly worded agreement that gave individual states considerable control over the importation of LMOs into their territories. The firm position taken by developing countries in support of the Protocol is significant given the way in which some commentators view this relationship. They see the Protocol as a source of cumbersome regulation that will hinder the development and well-being of these states. In this way, these commentators

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19 Katz, *ibid.* She concludes that the language of the Protocol, specifically the low level of risk that permits precautionary action, is ill-suited to the environmental issues the Protocol addresses and should be reserved for agreements dealing with riskier activities that offer no environmental benefit. The hazardous waste disposal treaty regime is cited as an example of such an agreement. It is argued that biotechnology is more akin to activities that generate greenhouse gases and the precautionary language of the Protocol should parallel the more flexible language of the climate change convention. (*Ibid.*)


21 Katz, *supra* note 9 at 978.


23 Adler, “Biosafe or Bio-Sorry”, *supra* note 9 at 764.
imply that developing countries are unable to determine what is in their best interest. They offer paternalistic advice about how these countries can best serve their own needs.

Commentators focus their advice on the necessity of utilizing biotechnology to solve the world’s food shortages while preserving habitat lands. They claim that the poorest countries of the world “desperately need the help of gene science” and that wealthy countries must “spread the biotechnology revolution to the poorest farmers who need it most.” Commentators argue that, given the urgency of global food shortages, the benefits of GMO use far outweigh the potential risks. Accordingly, they note that developing country support of the Protocol is “perplexing.”

Commentators also argue that by increasing regulation, developing countries will impede their own development and economic growth. One author notes that regulation is expensive and forces countries to redirect limited financial resources to its implementation. This may lead to poorer nutrition and health care, limited economic growth, greater corruption, fewer transfers of technology to the developing world and therefore fewer environmental and social benefits. For developing countries, it is argued, “one of the greatest risks of genetic engineering is not being able to use this technology at all.”

28 Adler, “More Sorry than Safe”, supra note 22 at 197.
29 Adler, “Biosafe or Bio-Sorry”, supra note 9 at 776.
iv. Summary

The perspectives and presumptions described above, which are consistent with a skeptical view of the Protocol's utility, can readily be traced throughout this collection of literature. However, even more striking is what cannot be found among the commentary. Some specific issues left unaddressed have been mentioned above, including the various factors that may prevent a country from obtaining the benefits of LMOs or that may make some states more vulnerable to the detrimental effects of LMOs.

These issues are particularly relevant to developing countries, yet the perspective of developing countries receives only superficial consideration in this writing. Provisions in the Protocol that specifically address developing country needs and that are intended to ameliorate the unequal and disadvantageous position of these countries receive little, if any, attention. Furthermore, the likelihood that the risks of LMO use may be more devastating in countries without these resources or infrastructure is not considered.30

The ability of biotechnology to assist in feeding the world's poor is discussed in the literature with little or no consideration of who would fund such an endeavour and whether it is insufficient yields or the inequitable distribution of food resources that is to blame for food shortages.31 Concerns of developing countries, including private sector control over the food supply and the disruption of local farming practices, are not incorporated into analyses. Instead, commentators are primarily focused on the

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30 For example, the risk of gene flow for certain organisms may be more pronounced in developing countries.

31 For a brief discussion of this issue, see Jabara, supra note 24 at 144.
“profound effect” that the *Protocol* will have on “the future of biotechnology and international trade.”

### B. Trade Implications of the Protocol

The second approach is distinguished by its focus on the trade implications of the *Protocol*. The impact of the *Protocol* on the existing international trade regime, embodied in the WTO agreements, was a particularly contentious issue during the drafting of the *Protocol*. Although negotiating groups struggled to reconcile competing trade and environment concerns, many issues remain unresolved.

This approach focuses on many of these unresolved issues. A significant amount of commentary discusses the potential conflicts that may arise between the provisions of the *Protocol* and those of the WTO agreements. Although commentators are not uniform in their conclusions regarding the possible clash between these two regimes, they discuss a broad range of concerns that may arise in a dispute between two states. In particular, they note that issues may arise regarding the ability to reconcile the following elements of the *Protocol* with the WTO agreements: the precautionary approach to decision-making; the ability to take socioeconomic considerations into account in

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32 Adler, “More Sorry Than Safe”, *supra* note 22 at 188.
decision-making;\textsuperscript{34} the labeling regime for commodities; and the ability to impose restrictions on products based on production and processing methods.\textsuperscript{35}

Some writers also comment on the likelihood that any dispute involving the Protocol and the WTO agreements would be subject to the dispute resolution mechanism of the WTO. Given that none of the significant GM exporting states are currently Parties to the Protocol, there is a significant chance that any dispute involving trade-related measures for GM products will be resolved within the WTO regime. Accordingly, the ways in which a WTO dispute panel could invoke the Protocol in its legal analysis are examined.\textsuperscript{36}

Given that the most significant trade-related dispute over biotechnology currently ongoing is between the EU and the U.S., it is not surprising that these political heavyweights are the focus of much of the writing that adopts this approach.\textsuperscript{37} The complex interactions between South and North\textsuperscript{38} over issues of trade and environment are not investigated in any detail. One commentator describes developing countries as “middlemen” in the polarized GM debate between the EU and the U.S.\textsuperscript{39} She argues that the Protocol, which “builds in an abundance of protective mechanisms...appears to

\textsuperscript{34} For an analysis focusing exclusively on the potential conflict between social impact assessments (in the context of the Protocol) and the WTO agreements, see Doreen Stabinsky, “Bringing Social Analysis into a Multilateral Environmental Agreement: Social Impact Assessment and the Biosafety Protocol” (2000) 9 Journal of Environment & Development 260.
\textsuperscript{36} Eggers & Mackenzie, \textit{supra} note 33 at 541-542.
\textsuperscript{38} While recognizing that the use of the terms “North” and “South” are somewhat problematic, they are used for convenience here to denote the developed and developing world (which are themselves problematic terms).
suggest potential ways to bring developing countries onto a level playing field in international trade.\footnote{Ibid. at 535}

While writers include some reference to the perspective of developing countries in their analyses, it is neither an in-depth nor broad consideration of the challenges these states face. For example, writers acknowledge that there is great uncertainty regarding the environmental risks of LMOs,\footnote{Erik Millstone & Patrick van Zwanenberg, “Food and Agricultural Biotechnology Policy: How much Autonomy Can Developing Countries Exercise?” (2003) 21 Development Policy Review 655; Eggers & Mackenzie, supra note 33.} that risks vary from place to place\footnote{Millstone & van Zwanenberg, ibid.} and that developing countries lack the expertise and resources of developed countries to manage these risks;\footnote{Ibid.} however, the broader implications of these claims are not investigated. One author discusses the relevance of socioeconomic impacts to developing countries, but premises her discussion on a misreading of the Protocol\footnote{Stabinsky, supra note 34.} and focuses primarily on the link between social impact assessment and the WTO agreements.\footnote{Phillips & Kerr, supra note 35 at 73.} Other writers fail to see the relevance of socioeconomic considerations to the Protocol’s goal of protecting biodiversity. They suggest that developing countries are not using the Protocol to protect the environment, but rather to secure a legal framework by which they can impose trade protectionist measures based on socioeconomic considerations.\footnote{Ibid.} They argue that this is being done “through the back door” because it could not be achieved by these states at the WTO.\footnote{Ibid.}
These arguments regarding the role of socioeconomic considerations in biosafety parallel those made by the collection of writers that adopt the first approach described above. Each of these two approaches involves an analysis of the Protocol but with a different goal in mind: the first approach aims to establish that the Protocol’s utility is limited because it interferes with the liberalized trade regime; the second approach seeks to examine the legal interaction between the Protocol and the WTO agreements. Commentators using each approach conclude that the provision on socioeconomic considerations within the Protocol will be used as a protectionist measure.

C. Globalization and Governance

The third approach focuses to a greater extent on the interests of developing countries and their relationships with other stakeholders in the biotechnology debate. One collection of writers utilizing this approach focuses on the interaction between biotechnology governance and globalization. In particular, the case study of biotechnology use in developing countries is used to examine the “intersection of globalization with poverty.” Another commentator emphasizes the competing governance claims within the Protocol.

i. Globalization and Poverty

This collection of writing is part of a research project in globalization and poverty that examines governance of biotechnology in developing countries. An overview of the research project notes that commentators have focused on the impact of international law on the “framework for national policy making” and the role of the biotechnology industry.

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in shaping this framework. The Protocol is not a central focus of this writing; however, it is frequently referred to in discussions of the limits placed upon policy-makers, particularly in developing countries, in structuring their domestic regulatory schemes. These limits include: the potential exclusion of socioeconomic concerns, lack of capacity and constraints on their ability to engage in international standard-setting.

With respect to the first of these limits, the ambiguity of the socioeconomic provision within the Protocol is highlighted and uncertainty about its scope and efficacy is raised. The fact that a consideration of socioeconomic impacts is subject to obligations under the WTO agreements is discussed in some detail.

The need for capacity-building to develop national frameworks for biosafety is raised by commentators as another limit imposed on policy-makers. One writer outlines various actors and circumstances that impact upon the development of domestic regulations; in particular, she emphasizes the influence of powerful governments in bilateral discussions. The writer notes that “linking capacity-building in biotechnology and biosafety to specific policy and regulatory options forecloses domestic public consultation and debate on the appropriate role of biotechnology in agriculture.” Other commentators focus on the role of industry in shaping biotech regulations and capacity-building, for example by relying on trade rules and endorsing a regime based on sound science. They note that “it is difficult for [least developed country] governments to turn down offers of support from the private sector” although “most are alert to the risk of

49 Ibid.
51 Ibid.
being influenced by such forms of support.”

Although the writing of these commentators is directly relevant to a consideration of the biosafety regime, none of the discussion regarding capacity-building is focused specifically on the Protocol.

Finally, commentators refer to the role of developing countries in international negotiations and institutions as a factor that limits them in their ability to develop strong regulatory frameworks. Constraints on their ability to influence international regulations to provide for greater flexibility in decision-making have an impact on domestic policy. One writer discusses developing country participation at the negotiations of the Protocol and notes several challenges that faced these countries including the consensus-based procedure, a lack of resources and transparency issues.

One commentator within this group argues that the nascent regime of governance for biotechnology “doesn’t adequately accommodate developing country concerns” given that the risks of this new technology are unknown. Other commentators link the weaknesses of public regulation of GMOs to the biotech industry. They argue that what has resulted is “regulation for business rather than regulation of business.” Accordingly, commercialization of biotechnology has trumped a “fuller consideration of the potential environmental and socio-economic risks associated with GM crops.”

Others in this group argue that greater flexibility and autonomy must be secured for developing countries. These countries need “secure policy space” in which to make

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53 Mackenzie, supra note 50 at 38-40; Newell & Glover, supra note 52 at 10-11.
54 Mackenzie, ibid.
55 Ibid. at 4.
56 Newell & Glover, supra note 52 at 6.
57 Ibid.
58 Ibid.
59 Mackenzie, supra note 50 at 5.
decisions regarding “whether and how to integrate modern biotechnology into domestic agricultural systems.” However, the role of the Protocol in either furthering or frustrating the need for flexibility, autonomy and policy space is not considered.

ii. Competing Norms of Governance

This approach focuses on how competing governance norms influenced the design of the Protocol. It is argued that in this regime of anticipatory governance, the lack of a “shared understanding” among the Parties regarding biosafety resulted in conflict between two competing governance norms: choice and trade facilitation. This conflict reflected the Parties’ differing views on whether the agreement was meant to facilitate flexibility in decision-making or predictability in decision-making.

This writing argues that the impact of this conflict was that a “minimalist” scope and contested, science-based decision-making were adopted in the Protocol. Although choice is “privileged” in the biosafety regime, the strong competing norm of trade facilitation resulted in a narrow Protocol based on scientific evaluations of risk. This reflected a lowest common denominator approach, an absence of “shared vulnerability” on the part of biotech-exporting states precluded a broader biosafety regime.

Science policy literature is referenced in this writing and it is argued that “science alone cannot mediate value conflicts” within the Protocol. Neither the concepts of

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60 Ibid. at 4.
61 This is described as a regime of governance that operates under “conditions of uncertainty and conflict over the potential for harm.” Aarti Gupta, Searching for Shared Norms: Global Governance of Biosafety (PhD. Thesis, Yale University, 2001) [unpublished] at 13 [Gupta, Global Governance].
62 Ibid.
63 Ibid. at 244.
64 Ibid. at 134.
65 This negotiating group is known as the Miami Group. It consists of the U.S., Canada, Australia, Chile, Argentina and Uruguay. This will be discussed further in Chapter 3.
66 Gupta, Global Governance, supra note 61 at 138.
67 Ibid. at 185.
“sound” science ⁶⁸ nor “safety” are universal, ⁶⁹ particularly in an area of anticipatory governance. This approach questions the role of information-sharing as a mechanism for managing risk given that the nature of the risks is contested among the Parties ⁷⁰ and the majority of biosafety information is controlled by the private sector. ⁷¹

This writing focuses almost exclusively on the transboundary transfer procedures. There is no consideration of the other components of the Protocol. Other than a concern about different perspectives on the nature of risk, the implications of information sharing between the “haves” of the developed world and the “have-nots” of the developing world are not explored. It is argued that the “key axes of conflict” within the Protocol were over scope and basis for decision-making, but this neglects the many other contentious issues that impacted the negotiation and will continue to play a role in implementation of the agreement.

The priorities of developed versus developing countries are examined in this work only to the extent that they sought different strategies of governance within the Protocol. The reasons for this divergence in opinion are not investigated in any significant detail. The reference to exporting states’ “absence of shared vulnerability” vis-à-vis the risks of GMOs, for example, neglects the other motivations that shaped their approach to negotiation of the Protocol.

Furthermore, the competing norms of choice and trade facilitation are presented as of equal significance and validity. It is presumed that there is no justification for

₆⁸ **Ibid.**, at 168.
₇₀ Gupta, *Global Governance*, ibid. at 249.
₇¹ **Ibid.**, at 256.
prioritizing one over the other; each may be compromised in a search for shared values. In this way, “choice” can still be “privileged” despite the significant obstacles imposed on it by the competing norm of trade facilitation. This ignores not only the broader set of circumstances relevant to developed and developing countries in approaching negotiation of the Protocol, but also the significant power imbalance that exists between them. It ignores issues of fairness, equity and responsibility. Moreover, one wonders how the constrained right of choice in the Protocol may be reconciled with the conclusion that “a critical function of the biosafety regime is to provide a context within which problems can be anticipated and options for action considered rather than being foreclosed through inaction.”

Finally, it is assumed that biotech-exporting states who have not signed the Protocol would nonetheless become part of the regime when it is operationalized in importing Parties’ domestic policies. The ability of these exporting states to stay outside of the Protocol’s regime is, however, both a legal possibility and a significant consideration in evaluating the Protocol.

IV. Theoretical Approach

The great majority of the literature described above provides an evaluation of the Protocol based on either the trade implications of the agreement or the environmental risks and benefits of biotechnology. Throughout these analyses, developing country interests are given only superficial consideration. This is evidenced by the view expressed by some commentators that developing country support of the Protocol is a “striking reversal” of their traditional resistance to trade-related environmental

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72 Ibid. at 258.
measures. This position is based on a narrow and unsatisfactory conception of developing country interests. Moreover, the South-North implications of the agreement are not investigated to any significant degree; the challenges posed to biosafety regulation by the different economic, social and cultural perspectives of South and North are ignored. Although one writer does focus on the different approaches to biotechnology by countries of the South and North, her commentary is restricted to a consideration of the different governance strategies they sought within the Protocol.

As outlined in the previous section, some of these broader concerns relating to developing countries and the South-North aspects of biotechnology are raised by a small group of commentators who focus their work on globalization and poverty. Yet, this work discusses the Protocol only briefly. A consideration of the perspectives brought by countries of the South and North to the negotiating table and the implications for the content and implementation of the Protocol are not discussed in detail.

Accordingly, many issues relevant to the Protocol still remain to be explored; this thesis seeks to address these issues with a particular emphasis on developing countries. This thesis provides a critical evaluation of the Protocol that borrows from two bodies of literature: alternative development theory and various streams of science and technology studies (STS). It also places a particular emphasis on the South-North dimensions of the Protocol and the issues that the Protocol sought to address. Although the various approaches that are adopted in this thesis fit within different categories of scholarship, the


\footnote{75} See Ivan Head, On a hinge of history: the mutual vulnerability of South and North (Toronto: University of Toronto Press, 1991).
perspectives and insights that are offered intersect at several points. Most significantly, the South-North focus of this critique serves as a common foundation on which alternative development theory and STS converge. This becomes clear in the discussion of these two theoretical approaches below.

A. Alternative Development Theory

i. Critical Development Approaches

Alternative development has emerged in the last 15 years as the latest in a series of critical development approaches that aim to expose the deficiencies in the mainstream development paradigm. Since its unveiling by President Truman in the aftermath of WWII, mainstream development has been grounded in the notion that progress and prosperity for the world’s impoverished will be achieved through greater production and economic growth. After being pursued by developed countries and international organizations for five decades, however, mainstream development has failed to live up to its optimistic predictions. Poverty plagues a growing number of people in the developing world, the gap between rich and poor continues to widen and it appears that “the model of development now widely pursued is part of the problem rather than the solution.”

For decades, critical development theorists and organizations within the development industry have attempted to elucidate the flaws of modern development and to suggest alternative approaches.

An early critical approach that emerged in the 1970s was also referred to as “alternative development.” The fundamental objective of this approach was human

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development through the fulfillment of basic needs. Although this approach was supported in the rhetoric of many international organizations, it was never translated into practice. Development programs retained a top-down structure and were focused on market-led growth. Even when an alternative approach was implemented, the results were often disappointing and reproduced problems associated with the mainstream paradigm. By the 1980s, support for this early form of alternative development waned.

The growing disparities between rich and poor and the failures of both mainstream and alternative development led some theorists to seek an alternative to development. Their analysis focuses on development as a discourse and is referred to as "post-development." They argue that development is not a natural phenomenon but has been constructed by Western culture and serves as a mechanism of power and control. Unfortunately, post-development theorists are criticized for failing to offer solutions to the problems that they uncover. Their work is rich in critique but lacking in practical advice.

79 Ibid. at 205, 221.
80 J. Black, Development in Theory and Practice: Bridging the Gap (Boulder: Westview, 1991) cited in Brohman, supra note 78 at 221-222.
81 Brohman, ibid. at 224.
83 Ibid. at 143.
85 Nederveen Pieterse, supra note 77 at 366.
Given the view of many theorists that post-development has limited practical value, some have returned to the idea of alternative development as a way forward. This new form of alternative development is certainly related to its 1970s predecessor; both adhere to some of the same fundamental principles including the importance of a people-centred, bottom-up form of development. Yet, in the 1970s there was a significant gap between alternative development theory and practice. Among other problems, external solutions were often imposed that were insensitive to “local particularities”, the technology advocated was geared towards large scale operations and programs were limited in scope. Accordingly, the new alternative development approach attempts to address the many shortcomings of its predecessor.

ii. A New Alternative Development

Proponents of the new alternative development attach great significance to issues of empowerment, participation and endogenous solutions. Alternative development writers argue that local communities must reclaim power and control over their resources, their well-being and the objectives of development.\footnote{Brohman, \textit{supra} note 78 at 221, 223-224.} Alternative development is critical of externally-imposed remedies and demands that local values and solutions take precedence.\footnote{J. Friedmann, \textit{Empowerment: The Politics of an Alternative Development} (Oxford: Blackwell, 1992) at 72 cited in \textit{ibid}, at 254.} As a consequence, the content of alternative development “may vary considerably from society to society.”\footnote{Rosi Braidotti \textit{et al.}, eds., \textit{Women, the Environment and Sustainable Development} (London: Zed Books, 1994) at 108.}
Alternative development is concerned with the “perspective of the excluded.”\textsuperscript{90} It privileges people’s knowledge over that of experts, but also recognizes that there is merit in all perspectives and experiences.\textsuperscript{91} In the tradition of post-development, it engages in a deconstruction of development discourse in order to challenge the existing power-knowledge structure.\textsuperscript{92}

Most alternative development approaches encourage production and growth, but with a focus on the well-being of local populations and ecological sustainability.\textsuperscript{93} Peet argues that production should take place in a “reasoned environment” in which “consequences …are discussed before action is taken.”\textsuperscript{94} He states that the objective should be “socialist development,” which involves “transforming the conditions of reproduction under the control of directly democratic and egalitarian social relations so that the needs of the poorest people are met.”\textsuperscript{95}

As outlined above, some common themes are apparent in alternative development writing; however, a comprehensive and thorough approach has not yet developed. An abundance of material does not yet exist from which to draw common philosophies and practical strategies. In fact a considerable amount of writing that does exist focuses on whether alternative development actually represents a distinct development theory or paradigm. Nederveen Pieterse argues it cannot constitute a “coherent” theoretical model for several reasons.\textsuperscript{96} First, since mainstream development is continually incorporating elements of an alternative development approach into its framework, the latter is not

\begin{footnotesize}
\begin{enumerate}
\item Peet & Hartwick, *supra* note 82 at 198; Nederveen Pieterse, *supra* note 77 at 351.
\item Peet & Hartwick, *ibid.* at 209; Brohman, *supra* note 78 at 263.
\item Peet & Hartwick, *ibid.* at 208; Hettne, *supra* note 90 at 199-200.
\item Peet & Hartwick, *ibid.*
\item Ibid.
\item Nederveen Pieterse, *supra* note 77 at 344.
\end{enumerate}
\end{footnotesize}
sufficiently distinct to constitute its own paradigm. Second, alternative development is constantly evolving in response to the mainstream paradigm and is too unsettled to constitute a distinct paradigm. Finally, if alternative development is given the status of a theory, it “establishes outsiders as experts over insiders.” Others have also noted that because alternative development varies between societies, a singular paradigm is not feasible. Regardless, Nederveen Pieterse finds alternative development to be a valuable source of critique and an important element in a “reflexive” process that identifies and evaluates the impacts of development. Other writers also highlight the role of alternative development as a “counterpoint critique” that evolves as its ideas are appropriated by the mainstream paradigm. One writer describes it in this fashion: “Criticize everything, convert critique into proposal, criticize the proposal, but still do something.”

iii. Science and Technology in Alternative Development

Like other aspects of alternative development, its approach to science and technology has not coalesced into a coherent, clearly defined set of principles. Nonetheless, writers have raised many critical issues and have offered some insight into the role that science and technology can play in alternative development. While many of these ideas have roots in earlier alternative development theories, others are based on critique of post-development.

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97 Ibid. at 348-9.
98 Ibid. at 349.
99 Ibid. at 357.
100 Braidotti et al., supra note 88 at 108.
101 Nederveen Pieterse, supra note 77 at 357, 368.
102 Hettne, supra note 90 at 199.
103 Peet & Hartwick, supra note 82 at 198. This is a reference to critical modernism, which is a stream of thought that is incorporated into the authors’ formulation of alternative development.
Alternative development theorists do not reject modern science and technology; rather, they recognize the potential of science and technology and seek ways to ensure that it is used for the benefit of all people.\footnote{104} They argue that foreign technology may be advantageous if certain conditions can be met.\footnote{105} These include “complementary measures to assist the poor”, a flexible approach that incorporates local knowledge and circumstance, public participation and local decision-making.\footnote{106} Moreover, alternative development theorists note that in many circumstances the combined use of indigenous and modern technologies may offer beneficial solutions to local populations.\footnote{107} From experience gained with farmers’ movements in India, Nanda argues that this “hybridization” of technologies offers a unique resource for improving the well-being of local populations through sustainable development.\footnote{108}

Alternative development theory recognizes that the hegemony of Western science results in the exclusion of other valuable forms of knowledge. Thus, it encourages reliance on indigenous knowledge and technology\footnote{109} and highlights the importance of “experiential knowledge.”\footnote{110} Theorists recognize some of the cultural and social biases of Western technology\footnote{111} but reject the notion that scientific thought is entirely a Western cultural construct.\footnote{112} Norgaard argues that it is not scientific knowledge that is the

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\begin{itemize}
  \item \footnote{104}Ibid. at 197-8.
  \item \footnote{105}Brohman, \textit{supra} note 78 at 268.
  \item \footnote{106}Ibid.
  \item \footnote{107}Ibid. at 268.
  \item Brohman, \textit{supra} note 78 at 266-7.
  \item Ziauddin Sardar, “Development and the Locations of Eurocentrism” in Munck, \textit{supra} note 76, 44 at 54; Kiely, \textit{supra} note 39 at 40.
  \item Nanda, \textit{supra} note 108 at 24.
\end{itemize}
problem, but rather “the inappropriateness of our historic understandings of and expectations for” it.\textsuperscript{113}

Alternative development theorists recognize that in order for science and technology to be beneficial, the society and environment into which they are being introduced must be better understood. Norgaard uses “coevolutionary process” to explain how knowledge, technology and society are intimately linked and how they coevolve in a reflexive process.\textsuperscript{114} For example, he explains that mechanisms of choosing or utilizing science and technology are “embedded in social structures which are themselves products of modern technologies.”\textsuperscript{115} Knowledge, technology and social structures “change, rather than advance” (as advocated in the mainstream paradigm) and the “’betterness’ of each is only relative to how well it fits with the others.”\textsuperscript{116} Norgaard argues that an understanding and acceptance of this process will help us to generate beneficial development alternatives.\textsuperscript{117}

Like their predecessors, alternative development theorists argue that “appropriate” technology should be used to promote development.\textsuperscript{118} No definition of “appropriate” is ever provided, although writers often refer to characteristics they deem necessary to ensure that technology is used beneficially and equitably. The most comprehensive outline of requirements is contained within \textit{Women’s Action Agenda 21},\textsuperscript{119} an alternative development framework developed at the First Women’s World Congress for a Healthy

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\item\textsuperscript{113} Richard B. Norgaard, \textit{Development Betrayed: The end of progress and a coevolutionary revisioning of the future} (London: Routledge, 1994) at 8.
\item\textsuperscript{114} \textit{Ibid.} at 29.
\item\textsuperscript{115} \textit{Ibid.}
\item\textsuperscript{116} \textit{Ibid.} at 37.
\item\textsuperscript{117} \textit{Ibid.} at 48.
\item\textsuperscript{118} Brohman, \textit{supra} note 78 at 267-8; Norgaard, \textit{supra} note 113 at 28.
\item\textsuperscript{119} Online: The International Institute for Sustainable Development \texttt{<http://www.iisd.org/women/action21.htm> [Action Agenda 21].}
\end{itemize}
\end{footnotesize}
Planet just prior to the United Nations Conference on Environment and Development (UNCED). This document notes that technology should be sustainable, ethical, people-friendly, non-violent and beneficial for women.\textsuperscript{120} Moreover, the socioeconomic impacts, risks and long term costs and benefits should be considered.\textsuperscript{121}

*Action Agenda 21* outlines additional elements of an alternative development framework. It underscores the need for information sharing, not only from the North to the South, but also from the South to the North\textsuperscript{122} and among countries of the South.\textsuperscript{123} Moreover, the need to disseminate information to local communities and to the people impacted by science and technology is emphasized.\textsuperscript{124}

Alternative development theorists recognize the limitations of earlier critical approaches and have attempted to develop a practical alternative. They recognize the tremendous potential of science and technology in promoting the well-being of all people; yet, they also acknowledge the challenges posed by introducing modern science and technology into different societies. *Action Agenda 21* provides the most comprehensive overview of an alternative development approach, incorporating concepts such as appropriate technology, sustainability, approval processes, dissemination of information, risk awareness and empowerment into a basic framework for development.

Alternative development is still evolving. This is evident from the fact that writers are currently engaged in a debate about whether alternative development is sufficiently distinct to constitute a coherent paradigm or theory. Nonetheless, alternative

\textsuperscript{120} Ibid.
\textsuperscript{121} Ibid.
\textsuperscript{122} Brohman describes an approach that calls on development experts to respect the knowledge of locals in developing countries. *Supra* note 78 at 269.
\textsuperscript{123} *Action Agenda 21*, supra note 119.
\textsuperscript{124} Ibid.
development holds considerable promise both as a source of critique of the mainstream paradigm and as a source of ideas for reconstruction.

B. Science and Technology Studies

As will become apparent below, many of the elements of an alternative development approach to science are echoed in the work of scholars in the field of STS. This discipline provides insight into the interactions between science and society and seeks to “[make] sense of the way technological societies construct their ways of life.”

Work in this field recognizes that experiences with science and technology may vary across different societies. In order to understand these experiences, STS exposes the “diversity of elements that together make up our sense of what is objective, real and reliable.”

STS questions the presumption of “science as truth” and exposes the fallacy that science is objective and neutral. Instead, science is revealed as a discipline imbued with social and cultural assumptions; these assumptions also impact the technologies that are generated with the input of scientific knowledge. As one scholar notes:

[S]ocial factors shape the production of all science and technology...Even the very cognitive assumptions behind what constitutes a rational argument, evidence, and so on are rooted in the beliefs of a specific discipline or scientific community. Thus, even the cognitive or rational can be seen as sociocultural.

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125 Sheila Jasanoff, “Coming of Age in Science and Technology Studies” (1998) 20 Science Communication 91 at 95 [Jasanoff, “Coming of Age”].

126 Ibid. at 93.

127 Ibid. at 95.

128 Gupta, Global Governance, supra note 61 at 53.

129 Jasanoff, “Coming of Age”, supra note 125 at 95.

This challenge to the superiority of scientific information means that alternate forms of informal knowledge and expertise may also gain prominence. In his way, STS attempts to democratize science.\textsuperscript{131}

The observation that science is not an objective discipline is also relevant to discussions by STS researchers regarding the relationship between science and policy. These writers note that the boundary between science and policy, or science and politics, is often unclear.\textsuperscript{132} STS scholars refer to the area in which science and policy overlap as “trans-science.”\textsuperscript{133} Despite this area of overlap, the “boundaries of ‘science’ and ‘policy’ are drawn by social actors to sustain a variety of social needs on a continually shifting map of privilege, politics and power.”\textsuperscript{134} The classification given to a particular matter, whether it is a scientific issue or a policy issue, will significantly impact the way in which it is resolved.\textsuperscript{135} As an example, STS scholars point to the distinction often made between risk assessment (viewed as scientific) and risk management (viewed as political). They note that “value judgments and policy” are always a part of risk assessment and that attempts to separate science policy-making “into a purely technical phase and a political phase” are flawed.\textsuperscript{136} The way in which risk is evaluated is necessarily dependent upon the cultural and political environment.\textsuperscript{137}

\textsuperscript{131} Gupta, Global Governance, supra note 61 at 259.
\textsuperscript{135} Jasanoff, “Contested Boundaries”, supra note 132 at 224.
\textsuperscript{137} Ibid. at 97.
STS writing illuminates the ways in which policy shapes information that is presented as scientific, particularly in areas where there is a high degree of uncertainty. A significant amount of work in this regard is done in the context of a study of global environmental assessments. Scholars demonstrate how the expert networks that develop these assessments inadvertently shape the outcome in line with certain policy choices. In this way STS reveals that where decisions must be made in situations of uncertainty, relying on “interpretable scientific knowledge,” those individuals and groups with greater capacity to “generate, support, maintain and use this information are likely to have a greater influence on the final decision.” This has significant South-North implications, given the tremendous divergence in capacity among these two groups of states with respect to scientific knowledge and know-how. The research conducted on global environmental assessments also suggests that “scientific information is likely to be effective in influencing the evolution of social responses to public issues to the extent that the information is perceived by relevant stakeholders to be not only credible, but also salient and legitimate.”

STS literature offers a useful framework in which the complex relationships between science, technology and society can be examined. It links science and technology to the social, cultural and political context in which they are developed and challenges the assumptions of those who portray science as a source of value-free knowledge. STS provides a critical lens through which to view the boundaries being

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139 See generally Biermann, “Science as Power”, *supra* note 133.
drawn between science and policy by powerful decision-makers in the public realm. In this way, it serves as a useful tool for evaluating the decisions being made by a diverse collection of governments, non-governmental organizations, intergovernmental organizations and industry representatives in an area of law that engages contested views of science, technology and risk.

V. Thesis Overview

Utilizing the perspectives offered by alternative development theory and STS, this thesis critically evaluates the Protocol by examining its implications for developing countries. This thesis argues that the Protocol does not adequately address developing country concerns because the mechanism of informed decision-making upon which it is based is flawed. The Protocol adopts a narrow conception of developing country interests and, as a consequence, provides inadequate information and insufficient decision-making powers to decision-makers in importing (primarily developing) states.

This thesis begins by identifying and explaining the concerns that developing countries sought to have addressed by the Protocol. Chapter two contains an overview of many of the historical events and developed country policies that have impacted food security in the developing world and that have played a role in shaping developing country concerns regarding biotechnology and biosafety. These concerns are then highlighted in chapter three, which provides an overview of the negotiating history of the Protocol. The chapter outlines the different views expressed by the negotiating groups, with a particular focus on the divergent attitudes of developed and developing countries. The chapter considers the significant conflicts that arose throughout the negotiation and provides a description of how these conflicts were resolved in the Protocol's final text.
Chapter four contains a critique of the *Protocol*, with a focus on the role of informed decision-making within the agreement. The chapter argues that although informed decision-making should serve as the foundation of the *Protocol*, this principle has been eroded both in the final text of the agreement and through the agreement's implementation. Informed decision-making is constrained to such an extent as to make it ineffective as a legal regulatory mechanism.

Finally, chapter five provides a summary of the findings made throughout this thesis.
CHAPTER II - SETTING THE STAGE FOR THE CARTAGENA PROTOCOL ON BIOSAFETY

The Cartagena Protocol on Biosafety was negotiated during a time of considerable debate regarding the benefits and risks of using modern biotechnology to enhance agricultural production. The polarized nature of the discussion regarding GMOs stems from the diversity of experience of the many stakeholders involved in the debate. The aim of this chapter is to outline several of the myriad circumstances and events over the course of the past few decades that have influenced the attitude of developing countries toward biotechnology and biosafety. In particular, the focus here is on the cautious attitude of developing countries toward biotechnology use for the purpose of combating food insecurity in their countries. Although proponents of agricultural biotechnology in developed countries and international organizations advise that GM crops are a necessary part of the solution to food security woes, this chapter reveals why there is good reason for developing countries to be skeptical of their advice.

This chapter begins with an overview of the food insecurity problems currently faced by developing countries. It continues with a discussion of developed country policies, including those relating to international trade and development, that have contributed to the food security woes of the developing world. The chapter then considers mechanisms, from the Green Revolution to the Gene Revolution, that developed countries and international organizations have advocated in order to combat food insecurity.

I. Food Insecurity in Developing Countries

For decades the international community has grappled with the devastating lack of food security and consequent malnutrition that exists throughout the developing world
with little success. The Food and Agriculture Organization (FAO) estimates that 842 million people are currently undernourished, 95% of whom live in developing countries.\textsuperscript{143} Although this actually represents a decrease in the percentage of the global population that is undernourished over the last two decades, the decline in absolute numbers has been less significant due to population growth.\textsuperscript{144} In fact, African and Latin American population growth has outpaced reductions in undernourishment and in both regions absolute numbers of undernourished individuals have increased.\textsuperscript{145} The situation is most grave in sub-Saharan Africa where 33% of the population is undernourished\textsuperscript{146} and 76% of the population lives on less than two dollars a day.\textsuperscript{147} Although this area is home to approximately 27% of the world’s extremely poor, that percentage is projected to increase to 50% in 2015.\textsuperscript{148}

The burgeoning global population poses a long term problem for all developing countries. The global population is expected to reach 9 billion people by 2050, of which approximately 7.5 billion will reside in developing countries.\textsuperscript{149} To feed this population, the world’s food harvest will need to increase significantly. Unfortunately, global crop

\begin{flushleft}
\textsuperscript{144} \textit{Ibid.}
\textsuperscript{145} \textit{Ibid.} at 110.
\textsuperscript{146} \textit{Ibid.} at 109. Particular regions of sub-Saharan Africa are even more dramatically affected. In 1999-2001 the proportion of undernourished people in Central Africa was close to 60% and in Southern Africa was just over 50%. FAO, \textit{The State of Food Insecurity in the World} (Rome: FAO, 2003) at 7, online: FAO <ftp://ftp.fao.org/docrep/fao/006/J0083E/J0083E00.pdf> [FAO, \textit{State of Food Insecurity}].
\textsuperscript{147} World Bank, \textit{2004 World Development Indicators} (Washington: World Bank, 2004) at 3 [World Bank, \textit{Development Indicators}].
\end{flushleft}
and livestock production has slowed in the last three years, resulting in a reduction in per capita output.  

These figures reveal that the global community is far from meeting its stated World Food Summit goal of reducing the number of undernourished people by half by the year 2015. To meet this goal, annual reductions in the number of undernourished people would have to be twelve times the current rate from now until the target year.  

Although this achievement is unlikely, many developed country governments, institutions and scholars believe that agricultural biotechnology offers great promise for combating this problem because it has the potential to significantly increase crop productivity. Accordingly, over the last few years these individuals and groups have advocated the use of transgenic crops as a primary component of the global fight against food insecurity and poverty.  

In addition to the many advocates of genetic engineering, there are also those who challenge the value of agricultural biotechnology. These individuals, groups and governments place the biotechnology debate in a broad context, examining the cultural, social and economic environment and the effects of biotechnology on the welfare of the community. Fundamental presumptions about the value of the technology are questioned. Those who challenge the benefits of biotech appear distrustful, not only of the companies that have developed this technology, but also of the public entities that advocate its use. Many find this response perplexing, given the dire circumstances faced by many developing countries and their limited resources to tackle growing poverty and food insecurity.

150 FAO, State of Food and Agriculture, supra note 143 at 114.
151 FAO, State of Food Insecurity, supra note 146 at 6.
Concerns about biotechnology as a mechanism of development have not arisen in a vacuum. Decades of experience with the trade, development and food security policies of the developed world have fostered skepticism among a significant and widespread group of individuals, organizations and states. These skeptics argue that developed country policies have failed to prioritize developing country needs and have themselves contributed to the food security woes of the developing world. Thus, GM skeptics question whether agricultural biotechnology, the latest policy advocated by the developed world, will address the root causes of food insecurity and improve the well-being of developing countries. These past experiences and the concerns they give rise to are considered in greater detail below.

A. Root Causes of Food Insecurity

Any discussion of global food insecurity must begin with this uncontroverted fact: sufficient quantities of food are produced each year to feed the entire global population. The problem faced by the world’s 842 million undernourished people is accessing that food. Food is inequitably distributed across the globe and, even when physically available, is inaccessible to people who cannot afford to purchase it. While

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productivity increases may be relevant to food security, particularly in the long term as the global population increases, it is misleading to frame the problem strictly in these terms.\textsuperscript{154}

Although GM advocates praise the technology for its ability to increase productivity, some are beginning to recognize that greater yields are not a complete solution to food insecurity. The U.S., the most vocal advocate of agricultural biotechnology, has recently acknowledged that global food security cannot be achieved simply by increasing production.\textsuperscript{155} The former U.S. Secretary of Agriculture has made it clear that, in addition to increased yields, measures are necessary to address the issue of the equitable distribution of food. To this end, she has identified a “widespread need for general development of legal and regulatory systems, along with greater investment in infrastructure” and has remarked that food security will be enhanced through “science-based trade rules” and open markets.\textsuperscript{156}

The recognition that productivity increases are insufficient to address food insecurity alone is a welcome one. Yet as the discussion below illustrates, the U.S. Secretary of Agriculture’s suggestions fail to adequately address the most significant obstacles to food access in the developing world and are vague enough to encompass measures that could hinder rather than promote food security. Moreover, the Secretary

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\textsuperscript{154} As one commentator astutely observes, no such link is drawn in discussions of undernourishment in the developed world. In the United States, approximately 8\% of children are hungry and 20\% are at risk of hunger. \textit{Hunger, 1997. What Governments Can Do}, Seventh Annual Report on the State of World Hunger (Silver Spring, MD: Bread for the World Institute, 1996) at 114-115, tables 5,6 cited in Lappé \textit{et al.}, supra note 153 at 14. Yet, “who would argue that not enough food is produced?” (Lappé \textit{et al.}, \textit{ibid.})


\textsuperscript{156} \textit{Ibid.}
of Agriculture’s statements demonstrate a significant limitation with U.S. food policy that impacts the developing world: a discrepancy between what is said and what is actually done.

i. The Role of Developed States

Only recently has the international community come together to address the issue of the global food supply in international forums.\textsuperscript{157} Yet, the problem of food insecurity has been shaped by events during the course of the last century. For developing countries, this problem is rooted in the policies of their former colonial rulers. As noted in the \textit{Declaration on the Eradication of Hunger and Malnutrition} adopted at the 1974 World Food Conference:

> The situation of the peoples afflicted by hunger and malnutrition arises from their historical circumstances, including social inequalities, including in many cases alien and colonial domination, foreign occupation, racial discrimination, apartheid and neo-colonialism in all its forms, which continue to be among the greatest obstacles to the full emancipation and progress of the developing countries and all the peoples involved.\textsuperscript{158}

Developed countries continue to play a role in creating and exacerbating the conditions that contribute to food insecurity and poverty in the developing world to the present day. Developed countries have exerted pressure on developing countries to open their borders and participate in the liberalization of global trade. As part of the strategy of free trade, developing countries have been encouraged to develop strong agricultural

\textsuperscript{157} States gathered at the World Food Conference in 1974, where attendees pledged to eradicate hunger, food insecurity and malnutrition within a decade, but failed to meet this goal due in part to “failures in policy making and funding.” FAO, “World Food Summit”, online: FAO <http://www.fao.org/wfs/index_en.htm>. Representatives of 182 states at the World Food Summit in 1996 adopted the Declaration on World Food Security and the World Food Summit Plan of Action and initiated joint programs with United Nations bodies, including the Office of the High Commissioner for Human Rights. They met again to follow up on the initiatives and goals of the World Food Summit at the 2002 Summit five years later.

export sectors to fuel their economies and fund development programs. At the same time, developing countries have become vulnerable to imports from around the globe. Although developing countries have opened their borders to imports in the interests of free trade, developed countries have not responded in a similar fashion. Developing country exports have been met with significant import tariffs in developed countries. Moreover, developing country exports have suffered due to depressed commodity prices and distorted competition resulting from exorbitant subsidies in the developed world. As a consequence, imports into developing countries have not been balanced by comparable levels of exports.

With a greater proportion of agricultural land dedicated to the cultivation of export crops, and given the increased availability of cheap imports from developed countries, developing countries have become net importers of food products for local consumption. Yet the inadequacy of developing countries’ export industries makes it harder to acquire the foreign exchange needed for these imports. This situation is exacerbated by the burgeoning debts of developing countries that must be serviced using the limited foreign exchange raised through trade. At the same time, foreign agricultural assistance from developed countries has decreased, leaving few resources for developing countries to invest in their own agricultural sectors and ensure the well-being of their populations. Moreover, food aid programs intended to ameliorate food insecurity problems have had minimal success because they have prioritized developed country interests over developing country need. The circumstances faced by developing countries in light of these developed country policies are considered in greater detail below.
The Export Economy

During colonialism, superior agricultural land was allocated by colonizing states to the development of export crops at the expense of local food production. The emphasis on developing country production of export cash crops gained new momentum in the 1970s and 1980s, this time facilitated by policies of the International Bank for Reconstruction and Development (the “World Bank”). In its 1970 Annual Report, the World Bank emphasized that “the development of a market-oriented agriculture producing cash crops for domestic and export sales is central to successful agricultural development.”

Several years later, there were indications that this policy was failing to benefit local communities; although productivity had increased significantly, the “physical condition of the poor was actually deteriorating” and crop production for domestic consumption was being neglected. Nonetheless, both the World Bank and the United States Agency for International Development (USAID) maintained their course. In one of three reports prepared to outline its strategy for assisting developing country agriculture, the World Bank identified the need for greater export crop production and noted that emphasis on

162 Sanford, *ibid.* at 257.
163 The emphasis on export production in the developing world did not focus exclusively on agricultural crops. The allocation of land for the raising of livestock was also promoted and the meat export industry grew significantly. Anne Buchanan, *Food, Poverty and Power* (Nottingham: Spokesman, 1982) at 92; George, *supra* note 1 at 149. Using 1989-1991 as a base year with a production value of 100, the relative livestock production for developing countries as a whole rose from 69.6 in 1979-1981 to 164.4 in 2002-2002. World Bank, *Development Indicators*, *supra* note 147 at 126.
market-based agriculture would likely expand domestic food supply. For this reason, a focus on export markets became a central component of trade liberalization policies imposed on developing countries as part of the World Bank’s structural adjustment programs in the 1980s. Similarly, USAID placed a greater emphasis on exports than in previous years and revealed a new strategy of “seeking policy leverage as a condition” of continued agricultural aid.

Developing countries have rarely prospered under these policies. In Brazil, for example, soybean exports soared throughout the 1970s and became the country’s largest export commodity by the end of the decade. In the fifteen years that followed, land cultivated with soybeans grew an additional 37%. Yet, during the initial period of this growth, the number of Brazilians without adequate food doubled from one third to two thirds of the population. As more land was allocated to soybeans throughout the 1980s and 1990s, the area dedicated to locally-consumed crops decreased. The price of staple crops (rice and black beans) soared and Brazil was forced to import large quantities of food for its growing population. Unfortunately, the mechanization of

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165 See Lappe et al., supra note 153 at c. 8.

166 Sanford, supra note 160 at 268.

167 Other countries that had similar experiences include Thailand, Bolivia and Chile. See Lappe et al., supra note 153 at 110-111.


170 Ibid.

171 Ibid.; George, supra note 1 at c. 4.
soybean production decreased the demand for labour\textsuperscript{172} leaving many unemployed Brazilians with fewer resources to purchase imported food.

While structural adjustment programs promoted the export of agricultural products, they also facilitated foreign investment in developing countries. The result was that local governments and populations did not always benefit from the resultant international commodity sales. For example, by the end of the 1980s greater than half of the agricultural businesses in Costa Rica were owned by foreigners.\textsuperscript{173} In Sub-Saharan Africa during the early 1980s,\textsuperscript{174} the agricultural sector’s growth rate decreased by 50\% and per capital gross domestic product (GDP) declined by 20\%.\textsuperscript{175}

As their agricultural sectors, at the behest of the World Bank, have been reoriented toward the production of export commodities, developing countries have become net importers of food.\textsuperscript{176} As a result, they are subject to volatile world market prices and are dependent on foreign exchange for imports. This foreign exchange is obtained, in part, through their growing export industries; however, export sales are also

\textsuperscript{172} George, \textit{ibid}.
\textsuperscript{174} In Ethiopia, the International Finance Corporation of the World Bank loaned 59 million to a Dutch agribusiness company for the development of a sugar export industry. Soon thereafter, over a fifth of the cultivated land in the Awash Valley was controlled by the company, resulting in the displacement of Afar tribespeople who relied upon the area for grazing their livestock. George, \textit{supra} note 1 at 211-212.
\textsuperscript{176} FAO, \textit{State of Food and Agriculture}, \textit{supra} note 143 at 122. Other factors also negatively impact the production of crops for domestic consumption. For example, land tenure systems that result in an inequitable distribution of cropland also impact productivity. George, \textit{supra} note 1 at c. 1. Land reform, which would enable the redistribution of land to minimize the concentration of large landholdings, would increase yields as small farm units are significantly more productive. For the first half of the 1970s, the World Bank did not advocate land reform as it viewed large farms with economies of scale more productive than smaller farms. This view changed in its 1975 policy review, where it was recognized that small farms could be 3 to 14 times more productive than large ones. U.N. Department of Economic and Social Affairs, \textit{supra} note 148 at 205-206; R. Albert Berry and William R. Cline, \textit{Agrarian Structure and Farm Productivity in Developing Countries} (Baltimore: Johns Hopkins University Press, 1979) at 132-133, table 5-1 cited in Lappe \textit{et al}., \textit{supra} note 153 at 91; Sanford, \textit{supra} note 160 at 270.
unpredictable. Many developing countries are susceptible to market fluctuations because they rely on a limited number of agricultural commodities for export. In just over 40 developing countries, a single agricultural export accounts for greater than 20% of total export revenues. 177 Commodity prices for these exports have fallen significantly over the last couple of decades, putting these countries in a vulnerable position. 178 These developing countries are limited in their ability to respond to this situation due to unfavourable terms of trade that they have been forced to accept. Under the structural adjustment programs of the 1980s, recipient countries were required to eliminate export subsidies 179 and reduce or eliminate import tariffs. 180 Ironically, many developed countries maintain domestic agricultural subsidies and impose tariffs despite the obvious injustice of such skewed terms of trade and the complaints of the global South.

### iii. Tariffs and Subsidies

During the period when developing countries abolished subsidies at the request of the World Bank, developed countries spent eight to ten times the amount they donated in agricultural aid on subsidies of their own. 181 By 2002, the countries of the Organization for Economic Cooperation and Development (OECD) were spending $318 billion 182 on agricultural subsidies annually 183 – just shy of $1 billion a day and still well in excess of the amount given to developing countries in agricultural assistance. 184 Subsidies have

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177 FAO, *State of Food Insecurity, supra* note 146 at 19.
178 Ibid.
181 Sanford, *supra* note 160 at 273.
182 All values are in U.S. dollars unless otherwise noted.
183 World Bank, *Development Indicators, supra* note 147 at 27.
184 Ibid. at 11.
negatively affected the export potential of developing countries\footnote{FAO, Committee on World Food Security, 30\textsuperscript{th} Sess., Assessment of the World Food Security Situation (2004) at para. 33, online: FAO <http://www.fao.org/docrep/meeting/008/j2716e/j2716e00.htm>.) by lowering commodity prices and "distort[ing] competition."\footnote{FAO, State of Food Insecurity, supra note 146 at 23.} For example, production subsidies to 25,000 cotton farmers in the United States totalled $3.9 billion in 2001-2002, "an amount higher than the entire GDP of Burkina Faso, where more than 2 million people depend on cotton for their livelihood."\footnote{Ibid. at 22.} It costs $1.61 to produce a kilogram of cotton in the United States, as compared to $0.47 per kilogram in Burkina Faso, but "guaranteed subsidies have encouraged U.S. cotton farmers to increase production, even as the price of cotton has collapsed."\footnote{Ibid. at 22-23.} Likewise, $2.3 billion in subsidies to sugar producers have made the EU the second biggest exporter of this commodity despite the fact that developing countries can produce sugar for the half the cost of their EU competitors.\footnote{Ibid.}

Developing countries have vehemently protested the use of subsidies at gatherings of the WTO;\footnote{See Anuradha Mittal, “Daily Report from Cancin \#5” (12 September 2003), online: Food First, Institute for Food and Development Policy <http://www.foodfirst.org/wto/reports/2003-09-11AM2.php>; WTO, “Export Subsidies and Competition” (25 October 2004), online: WTO <http://www.wto.org/english/tratop/e/agric/e/negs/bkgrnd08_export_e.htm>.} in response, the U.S. has asked to be compensated by developing countries for the reductions they seek.\footnote{Mittal, ibid.}

Not only must developing country exports compete with subsidized products from the developed world, they may also be subject to tariffs upon import.\footnote{Close to 50\% of goods imported into the United States are subject to tariffs. The EU has significantly lowered tariffs in accordance with its "Everything but Arms" policy, now allowing close to 100\% of imports into its member states tariff-free. Other developed countries fall in between these two extremes. World Bank, Development Indicators, supra note 147 at 26.} These tariffs are applied to the products of developing countries more often than those of developed
countries.193 Moreover, processed imports are subject to substantial tariff escalation. This scheme impacts “products processed from commodities for which many developing countries enjoy a comparative advantage” and “[makes] it difficult for developing countries to escape the cycle of producing and exporting primary products.”194 These economic barriers unjustifiably target the overwhelming majority of the world’s farmers – those who are in greatest need of assistance. As noted in a joint declaration by the Heads of the International Monetary Fund, OECD and World Bank:

[R]eforming the current practices in global farm trade holds perhaps the most immediate scope for bettering the livelihoods of the world’s poor. Yet, developed countries impose tariffs on agriculture that are 8 to 10 times higher than on industrial goods. Many continue to use various forms of export subsidies that drive down world prices and take markets away from farmers in poorer countries. In every sector except agriculture, these same countries long ago agreed to prohibit export subsidies...Much of this support depresses rural incomes in developing countries while benefiting primarily the wealthiest farmers in rich countries...195

iv. Foreign Aid and Developing Country Debt

The difficulties faced by developing countries are compounded by their burgeoning debts and the rapid decline in foreign aid they received over the past several decades. In order to service mounting debts in the 1980s, developing countries sought to maximize cash crop exports to obtain foreign exchange for creditors.196 However, because of the challenges these countries confronted in fuelling export growth, they faced an unenviable quandary. As explained in a report to the U.S. Congress in 1984: “The current...debt situation, combined with flat or declining export markets for many [lesser developed country] commodity exports, will make it difficult for...governments to pay for needed

193 Ibid, at 304.
194 FAO, State of Food Insecurity, supra note 146 at 22.
195 OECD, “Trade, Development and Capacity Building” (4 September 2003), online: OECD <http://www.oecd.org/document/9/0,2340,en_2649_34665_11813577_1_1_1_1,00.html>.
food or food production inputs or for the investment needed to increase agricultural output.”

Thus, not only had agricultural exports failed to generate sufficient foreign exchange to pay down developing country debt, but these countries also struggled to purchase food. Over the next two decades developing country debt continued to mount, reaching a staggering total of more than $2.3 trillion in 2002.

While developing states have been crippled by the weight of their debts, foreign aid has rapidly diminished. Agricultural aid peaked in the early 1980s at approximately $27 billion and has been in decline since, falling to $12 billion in 2000. Moreover, agricultural aid is not distributed in proportion to the level of need. Sub-Saharan Africa has experienced the most acute decline in aid, and assistance “per agricultural worker is higher in those countries with the lowest prevalence of undernourished people in the population.” At the recent United Nations Conference on Financing for Development held in Monterrey, Mexico, states pledged to increase official development assistance to 0.29% of donors’ gross national income (GNI) by 2006. Even if these commitments are realized, development assistance would remain well below 1990 levels of 0.34% GNI. The United States has the most dismal record of all the members of the Development Assistance Committee of the OECD, with overseas assistance of 0.13%

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197 Galdi, supra note 153 at 11.
198 World Bank, Development Indicators, supra note 147 at 244.
199 FAO, State of Food and Agriculture, supra note 143 at 131-132. Measured in constant prices, agricultural assistance has gone from approximately $27 billion in 1982 to $12 billion in 2000. (Ibid.)
200 Ibid, at 131.
201 World Bank, Development Indicators, supra note 147 at 304. Gross national income is defined as “the sum of the value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. (Ibid, at 17.)
202 Ibid, at 304.
203 The Development Assistance Committee is the 23-member body “through which the OECD deals with issues related to co-operation with developing countries.” See http://www.oecd.org/dac/.
GNI in 2002 and a projected increase to only 0.17% GNI for 2006. Diminishing agricultural and development assistance means that fewer resources are available for such things as developing and implementing pro-poor agricultural policy, building infrastructure or providing citizens with basic necessities.

v. Food Aid Policy of the U.S.

Although it is certainly not viewed as a panacea for the problem of food insecurity in the developing world, food aid has played a role in remedying short and longer term food shortages and in funding agricultural development projects for decades. The United States is consistently the largest donor, contributing over half of the aid received by the World Food Programme (WFP) in 2003. U.S. food aid contributions are distributed in accordance with Public Law (PL) 480, the Agricultural Trade Development and Assistance Act of 1954, which was later renamed the Food for Peace Law. Over the past 50 years, Food for Peace has reached close to 3.5 billion people in 135 countries with the shipment of over 106 million metric tons of food. A report marking the 50th anniversary of the program boasts that “Food for Peace has done its best to live up to its

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204 World Bank, Development Indicators, supra note 147 at 304.
205 The United States first donated food aid in 1812, but it was not until the Marshall Plan was implemented in 1949 and legislation was passed in 1954 that these donations became a significant part of U.S. foreign policy. See USAID, “Celebrating Food for Peace, 1954-2004: Bringing Hope to the Hungry”, online: USAID <http://www.foodaid.org/usaiddoc3.htm> [USAID, “Celebrating Food for Peace”].
206 Ibid.
207 Pub. L. No. 83-480, 68 Stat. 454 (codified as amended at 7 U.S.C. § 1701(1988)) [PL 480]. The full text of the law, as amended to January 23, 2004, may be found at USAID, “Celebrating Food for Peace”, ibid. President John F. Kennedy renamed the law early in his administration. This legislation has three primary components, each of which plays a different role in the relief of poverty and undernourishment. Under Title I, favourable loans may be granted to private entities or developing countries for the purchase of American agricultural commodities. Title II provides for aid to be donated in emergency and non-emergency situations as famine relief. Under Title III, the Food for Development Program, agricultural products are donated to least developed countries and the revenue generated from their sale in the recipient country is used for long term development projects. The legislation has undergone significant changes since it was originally passed by Congress, but these are not discussed here. The three components described are those that exist currently. There is also a Farmer-to-Farmer Program established under Title V of PL 480, which operates as part of the Title II program.
208 USAID, “Celebrating Food for Peace”, supra note 205 at 6, 15.
historic mission to alleviate hunger around the world” and that its successes constitute a “unique American achievement.”

Benefits for the Donor

Despite these achievements, altruism has not always been the primary driving force behind PL 480. At the time of its enactment, the act was seen by officials as a creative means of disposing of agricultural surpluses without dumping them into the U.S. market and depressing prices. Even after surpluses were depleted by the end of the 1960s, PL 480 enabled the U.S. to generously subsidize its farmers either through direct purchase of agricultural commodities or by enabling foreigners to do the same.

In response to crop surpluses throughout the 1960s, the U.S. reduced the area of land cultivated by its agricultural workers. PL 480 food aid contributions suffered as a consequence. The peak year of 1962 saw 19 million tons of food shipped to countries in need, but this figure had shrunk to 3.3 million tons by 1974. The decline in Food for Peace shipments coincided with the worst global food shortage crisis experienced in decades. Not only were U.S. food aid contributions dismal during the period when the developing world was most in need, but the government was also faulted at the time for

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209 Ibid. at 14.
210 Robert R. Spitzer, No Need for Hunger: How the U.S. Can Help the World’s Hungry to Help Themselves (Danville, Illinois: Interstate Printers & Publishers, Inc., 1981) at 89; Larry Q. Nowels, “Chapter XI – Food Assistance: U.S. and Multilateral Programs since the World Food Conference” in U.S., Foreign Affairs Report, supra note 153, 313 at 344. The surpluses were the product of a price support program by the American government, in which it purchased and stored excess agricultural commodities from its farmers. (Spitzer, ibid.) The author is the former U.S. Coordinator of the Food for Peace program.
211 In the fifty years that PL 480 has been enacted, $30 trillion of U.S. agricultural commodities have been sold under Title I. U.S., S. Res. 402, Expressing the sense of the Senate with respect to the 50th anniversary of the food aid programs established under the Agricultural Trade Development and Assistance Act of 1954, 108th Cong., 2004, online: Thomas <http://thomas.loc.gov>.
212 Other major grain-producing nations also took land out of cultivation.
213 George, supra note 1 at 10. The U.S. took 50 million acres out of production and compensated farmers for their economic losses. (Ibid.)
214 Galdi, supra note 153 at 9.
215 During the World Food Conference in 1974, the head of the FAO implored the U.S. and other states to increase production moderately so that tragedy could be avoided. George, supra note 1at 10.
the political manner in which its limited contributions were distributed. This was not the first time, nor would it be the last, that political considerations outweighed need in the distribution of PL 480 aid.

In addition to moderating agricultural surpluses at home, providing subsidized exports for U.S. farmers and implementing foreign policy goals, President Eisenhower noted that the Food for Peace program was intended to assist Americans by “[laying] the basis for a permanent expansion of [U.S.] exports of agricultural products.” According to the former Coordinator of Food for Peace, “[t]he last unexploited frontier for markets is in Third World countries.”

The strategy of using PL 480 to increase U.S. agricultural exports has been an overwhelming success. By the mid-1960s, the program had resulted in significant balance of payments savings and it was noted that “the economic development built into food aid programs measurably improves US export sales opportunities.” Increases in commercial sales to aid recipients have continued. By the mid-1990s, USAID reported that 90% of countries importing American agricultural commodities were previous

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216 Nowels, *supra* note 210 at 344. In 1974, just under half of all PL 480 shipments, valued at $451 million, were made to the nations of Vietnam and Cambodia. (*Ibid.*) The same year, the total aid that reached all of Latin America was less than one fifth this amount and the entire continent of Africa received $40 million less than Cambodia alone. George, *supra* note 1 at 179.

217 For example, in 1966 the U.S. administration had prohibited the shipment of emergency donations under Title II of PL 480 to any state that permitted trade, or transit of trade, with North Vietnam or Cuba. George, ibid. at 179. For information on the skewed distribution of U.S. food aid under PL 480, see Nowels, *supra* note 210 at 332-337, 344-347. See also Lappé *et al.*, *supra* note 153 at c. 10.

218 USAID, “Celebrating Food for Peace”, *supra* note 205 at 7. This is also outlined in the text of the act. The act establishes that the U.S. will “use its abundant agricultural productivity” to, *inter alia*, “expand international trade” and “develop and expand export markets for United States agricultural commodities.” The legislation also notes that, for agreements entered into under Title I, priority shall be given to “developing countries that...have the demonstrated potential to become commercial markets for competitively priced United States agricultural commodities.” PL 480, *supra* note 207, § 2, 102.

219 Spitzer, *supra* note 210 at 315 [emphasis in original].

220 PL 480 Annual Report, 1966 cited in George, *supra* note 1 at 170. In the same year, the concept of “self-help measures” was added to PL 480, tying American aid to a series of conditions. For example, the recipient country may have been required to “[create] a favourable environment for private enterprise and investment, thereby facilitating the further expansion of U.S. exports.” (*George, ibid.* at 174.)
recipients of food aid;\textsuperscript{221} moreover, it remarked that “the principal beneficiary of America’s foreign assistance has always been the United States.”\textsuperscript{222}

*The World Food Programme and GM Food Aid*

The notion that the interests of American producers, rather than recipient countries, are often paramount in the development and implementation of U.S. food aid policy was best exemplified by the conflicts that arose several years ago during a severe food shortage crisis in drought-plagued Southern Africa. The WFP responded to the crisis by seeking donations from countries around the world. A significant proportion of aid from the U.S. Food for Peace program is distributed through the WFP, and the U.S. far exceeds any other state in its contributions to the agency. In fact, it was the primary aid donor for the six African nations impacted by the crisis, providing approximately 50 percent of the one million tonnes of food requested for the region.\textsuperscript{223} The majority of this food aid consisted of U.S. grown GM maize.

The food aid sparked considerable controversy within the recipient states because it contained GMOs. Swaziland accepted the GM food directed to it, but warned its citizens to use the grain for consumption only and not to plant it as seed.\textsuperscript{224} Lesotho, Malawi, Zimbabwe and Mozambique refused to accept the food unless it was milled,\textsuperscript{225} which destroys the capacity of the grain to function as seed and propagate for the following year’s harvest. As the U.S. refused to mill the food it was donating,\textsuperscript{226} these four

\textsuperscript{222} *USAID Developments* (Summer 1997) at 4 cited in Lappé et al., *ibid.* at 131.
\textsuperscript{225} *Ibid.* at 21.
\textsuperscript{226} Robert Vint, “The U.S. is Force-Feeding Developing Countries with GE Foods and Crops” (23 August 2002), online: Organic Consumers Association
countries were forced to find the means to do so themselves. With contributions from
their own coffers, and the assistance of South Africa, the countries managed to mill the
donated food before it was distributed. The government of Zambia refused to accept the
GM food even in milled form, despite the presence of 2.5 million people facing severe
food shortages within its territory. The WFP scrambled to find non-GM replacement
stocks, which it eventually received several months later.

At the time of the crisis, the United States donated funds to the WFP that were
used to purchase GM food from American farmers. In this way, the U.S. government
provided a benefit to its domestic farmers and its burgeoning biotech industry. However,
the U.S. could have benefited a greater number of people in the developing world by
providing milled food or by purchasing non-GM food from other developed or
developing countries. As noted by the former Executive Director of the Board on
Agriculture for the U.S. National Academy of Sciences:

[T]here is no shortage of non-GMO foods which could be offered to
Zambia by public and private donors. To a large extent, this ‘crisis’ has
been manufactured (might I say, ‘engineered’) by those looking for a
new source of traction in the evolving global debate over agricultural
biotechnology. To use the needs of Zambians to score ‘political points’

227 Will Knight, “Zambia bans GM food aid” New Scientist (30 October 2002), online: New Scientist
228 The replacement stocks were received from the EU, Norway, Japan, Uganda and Tanzania. “Zambia:
Government Completes GM Guidelines” (8 January 2003), online: IRINNews.org
229 For example, Mozambique had 100,000 metric tonnes of surplus maize ready for export in September
2002, but it was “considered too expensive to shift to the south.” “WFP Launches Massive Regional
Appeal as Starvation Threatens Millions” (26 September 2002), online: WFP
on behalf of biotechnology strikes many as unethical and indeed shameless. 230

In fact, the provision of U.S. GM food aid to the region may have been a breach of U.S. obligations under international law. The U.S. has adopted, or adhered to, several sets of policies and regulations that guide its conduct with regard to the provision of aid to foreign countries. 231 For example the Food Aid Convention, 1999 to which the U.S. is a party, states that its objectives are to be met by:

Encouraging members to ensure that the food aid provided is aimed particularly at the alleviation of poverty and hunger of the most vulnerable groups and is consistent with agricultural development in those countries...[and by]

Including principles for maximising the impact, the effectiveness and quality of the food aid provided as a tool in support of food security. 232

Yet, while some countries like the United Kingdom ensure that over 80% of their donations are used for triangular transactions (the purchase of food aid from one developing country for distribution in another), 92% of U.S. donations are in-kind. 233 Not only does this prioritize support of American agricultural producers over those in developing countries, but in 2002 it led to circumstances in which the suffering of millions of people was prolonged, nearly resulting in disaster.

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230 Dr. Charles Benbrook “Comments to the Zambian Delegates” (13 September 2002), online: Ag Biotech Infonet <http://www.biotech-info.net/zambian_statement.html>. These remarks were made to a delegation from Zambia.

231 The World Food Summit Plan of Action promotes policies that are “most conducive to achieving sustainable food security for all” and that encourage aid operations that involve the purchase of food from other developing countries. Supra, note 152, Objectives 1.1, 1.2. Moreover, the WFP lists as one of its core policies, improving the “nutrition and quality of life of the most vulnerable people.” WFP, “The WFP Mission Statement”, online: WFP <http://www.wfp.org/policies/Introduction/mission/index.asp?section=6&sub_section=1>.

232 1 May 1999, 2073 U.N.T.S. 135, arts. I(b), (c) (entered into force 1 July 1999, ratification by U.S. 5 January 2001), online: U.N. <http://untreaty.un.org/English/notpubl/19-41c-eng.htm>. The Food Aid Convention also provides that food aid “should be aimed at enhancing food security in recipient countries” and “should take particular account of longer-term rehabilitation and development objectives in the recipient countries.” The Parties agreed that, “in order to promote local agricultural development” they consider giving their donations in the form of cash so that food may be purchased from other developing countries. (Ibid., Articles VIII(b), VIII(d), XII(a).)

Contrary to the opinion of those who praise Food for Peace for doing everything possible to alleviate hunger in the developing world, fifty years of U.S. food aid policy demonstrates that U.S. interests often trump developing country food security needs. Moreover, despite repeated assertions to the contrary, the interests of developing countries may not always be the primary or even secondary motivation behind the development of U.S. food aid strategies. It is ironic that after commending the Food for Peace program on its 30th anniversary as "one of the greatest humanitarian acts ever performed by one nation for the need of other nations" President Reagan commented in a slip of the tongue that it was "a major initiative to help the starving people of America - or Africa, I should say - and the world."[234]

vi. Conclusion

In 1974, when the global community gathered at the World Food Conference to discuss growing poverty and undernourishment in the developing world, efforts were focused on increasing productivity to generate a greater food supply.[235] States failed to meet their stated target of eradicating hunger, food insecurity and malnutrition within a decade due in part to "failures in policy making and funding."[236] Today we are poised to fail, yet again, in meeting the target set at the 1996 World Food Summit to reduce the number of undernourished people by half in under twenty years. A key factor has been the failure to rectify the inconsistencies and contradictions in developed country policies that frustrate, rather than facilitate, efforts to ensure food security. Perhaps this has also

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[234] "Reagan Hails Food Project he Tried to Reduce in 1982" The Washington Post (11 July 1984) A4 (ProQuest Historical Newspapers). When he misspoke, President Reagan was specifically referring to a new program aimed at delivering food more efficiently. This program was to be a part of the broader Food for Peace program.


impacted the credibility of developed states in advocating new policies that are touted as “imperative” to ensuring food security. It was, after all, the United States that insisted upon the inclusion of biotechnology within the final declaration of the 2002 World Food Summit (“2002 Summit”) but resisted recognition of a right to food in the same document.237

II. The Green Revolution

Developing countries’ experience with a mechanism advocated historically by developed countries and international institutions to combat food insecurity is also relevant to an understanding of developing country attitudes toward biotechnology. This mechanism is the Green Revolution, an agricultural program implemented in the 1960s and 1970s that aimed to increase productivity using high-yield varieties of plants. The discussion below considers the efficacy of this program in tackling food insecurity and the impact of its implementation in the developing world.

A. New Yields

Governments and private organizations in developed countries finance research aimed at advancing agricultural practices and increasing crop productivity in developing countries and elsewhere. The most significant achievement in this regard came in the early 1960s238 with the advent of what is now referred to as the “Green Revolution.”239 The catalyst for this so-called revolution was the selective breeding of high-yielding varieties (HYVs) of wheat and maize. HYVs can absorb high quantities of fertilizer and,
because they have been bred as dwarf plants, are able to withstand the weight of high yields of grain without lodging (falling over). With these genetic advantages, and with heavy inputs of water and pesticides, HYVs are capable of boosting productivity in shorter growing cycles without requiring additional areas of cultivated land.

The Green Revolution began in Mexico, where research on new plant varieties funded by the Rockefeller Foundation and the Mexican government was conducted in an institute now referred to as the International Wheat and Maize Improvement Centre (CIMMYT).\footnote{This acronym reflects the Institute’s Spanish name.} Productivity increased significantly in areas planted with the new seeds, often to two or three times the normal yield.\footnote{George, supra note 1 at 88-89.} “With this success” the Rockefeller Foundation, in partnership with the Ford Foundation and several state governments, extended the revolution to Asia with the establishment of the International Rice Research Institute (IRRI) in the Philippines in 1962.\footnote{Ibid. at 88. The new varieties from CIMMYT and IRRI were not commercially available until 1965. Andrew Pearse, Seeds of Plenty, Seeds of Want: Social and Economic Implications of the Green Revolution (Oxford: Clarendon Press, 1980) at 37.} Within the decade, HYVs had been planted on 34 million acres of cultivated land in Asia, “roughly 1/10 of the region’s total grain acreage.”\footnote{Brown, supra note 164 at 4.} Two additional research centres were launched by 1971, when the World Bank was asked to form an organization to ensure that developing countries would benefit from the scientific advances being made with HYVs.\footnote{CGIAR, “Impact: Everybody’s Business. CGIAR Annual Report 2003” at 7, online: CGIAR <http://www.cgiar.org/publications/core/index.html>.} The resulting Consultative Group on International Agricultural Research (CGIAR) now has fifteen research centres around the globe and is funded by various international organizations and private donors.\footnote{See http://www.cgiar.org.}
In terms of increases in agricultural yields, the accomplishments of the Green Revolution have been considerable. HYVs result in “tens of millions of extra tons of grain a year” and in many countries where the new varieties were planted, food production increased two or three-fold in the first twenty to thirty years. In Pakistan, for example, the wheat harvest increased by almost 60% during the latter half of the 1960s and India experienced a 50% increase. In the Philippines, rice production increased by over two million tons in just over a decade and yields rose from approximately 1,250 to 1,800 tons per hectare. The early successes of HYVs in producing greater yields led some to make bold predictions about the potential of the new plants. In 1970, Lester Brown, the former head of the U.S. Department of Agriculture’s (USDA) International Agricultural Development Service and one of the key policymakers during the spread of HYVs in the 1960s noted that “[t]he Green Revolution has, at least temporarily, laid the spectre of famine to rest.”

The Green Revolution was viewed as a promising development strategy that would provide “both lower food costs and higher incomes” and a means of “shrink[ing] the subsistence share and increas[ing] the commercial share” of developing country economies. This focus on moving from subsistence to modern agriculture was reflected in an Asian Development Bank agricultural survey published in 1968, which rejected the idea “that there are development strategies that can provide enduring

246 Lappé et al., supra note 153 at 59.
248 Brown, supra note 164 at 5.
249 Pearse, supra note 242 at 213.
250 Brown, supra note 164 at 132.
251 Ibid. at 134.
production growth by a judicious mixing of some aspects of modern science with the so-called realities of traditional belief and methods.” Moreover, advocates of the Green Revolution believed that modernization would lead to other changes:

As the mold of tradition is broken, farmers become more susceptible to change in other areas. They may become more interested in education and more receptive to family planning. The economic and political relationship between farmers and the rest of the economy begins to change fundamentally. Using purchased inputs, and marketing additional production, peasant farmers are drawn into the mainstream of modern economic life.

Yet, at the same time that these development strategists were extolling the virtues of the Green Revolution, they were also cautiously expressing some concerns about the potential social and political impacts of the new technology. As the new varieties spread across much of the developing world in the following two decades, many of these problems began to surface.

**B. Beyond High Yields**

It became clear that something was amiss with the Green Revolution when increases in crop productivity were not always associated with improved food security. In the Philippines, for example, rice self-sufficiency had almost been attained by the mid-1970s, but the majority of the population had inadequate access to food and “official

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255 See e.g. references to testimony before the Subcommittee on National Security Policy and Scientific Developments of the House Committee on Foreign Affairs in 1969 in George, *supra* note 1 at 103; see also Brown, *supra* note 164 at c. 1, 9.
256 Although not discussed in the text, the reliance of HYVs on enormous quantities of pesticide and fertilizer resulted in widespread environmental degradation. Moreover, the energy used in food production increased enormously with the advent of the Green Revolution. Energy rates (energy out/energy in) of traditional agricultural crops range from 10 to 70, whereas industrialized agricultural crops range from 0.1 to 5. Bernhard Glaeser & Kevin D. Phillips-Howard, “Low-energy farming systems in Nigeria” in Glaeser, *supra* note 153, 126 at 127-133. The use of HYVs has also lowered heterogeneity and resulted in rapid degradation of soil quality. See generally Spitz, *supra* note 239 at 56.
sources” reported that “60-70% of all young people were undernourished.”\textsuperscript{257} Similarly, high crop yields in Mexico had little if any impact on food security for much of the population.\textsuperscript{258} These were not isolated cases.\textsuperscript{259} In fact, the World Hunger Commission’s 1980 Report Summary noted that the “world hunger problem is getting worse rather than better.”\textsuperscript{260} Two decades later, the situation had deteriorated. Although China made significant progress in reducing its food security problems, the number of undernourished people in the rest of the world increased between 1970 and 2000.\textsuperscript{261}

The failure of HYVs to improve the food security situation of many people in the developing world is related, at least in part, to some of the social and economic impacts of the new technology. These impacts have been the focus of considerable study.\textsuperscript{262} Research reveals that the introduction of HYVs intensified growing inequalities within the population of developing countries, particularly with respect to income. A review of 307 studies on the Green Revolution published from 1970-1989 concluded that over one third of authors believed the new technology intensified “income differences both within and between regions.”\textsuperscript{263} Less than 4\% of the authors found that “the technology narrowed such differences.”\textsuperscript{264} Accordingly, of those studies that made conclusions “on

\begin{footnotes}
\item[257]Pearse, supra note 242 at 213-214.
\item[258]Ingrid Palmer, Science and Agricultural Production (UNRISD, 1972) cited in George, supra note 1 at 97.
\item[260]Reprinted in Spitzer, supra note 210, 329 at 331.
\item[263]Ibid. at 270
\item[264]Ibid.
\end{footnotes}
producer-level and interregional distribution of benefits” from HYVs over 80% found that “greater inequality resulted.”

There are various reasons why the introduction of HYVs heightened inequalities. The new plants that fuelled the Green Revolution require large inputs of water, fertilizer and pesticide in order to flourish. Not only are these inputs expensive, but in some instances inadequate credit was available to enable farmers to cultivate HYVs. Where credit was available, tenant and small scale farmers often lacked sufficient collateral to borrow or may have already been indebted. Moreover, not all of the inputs necessary for the new varieties are scale neutral. For example, although chemicals can be obtained in modest quantities for use on a smallholder’s land, the availability of water proves more challenging. If a public water system is unavailable, a farmer will likely rely on a monopoly supplier, which will increase costs. Large landowners, by contrast, can often purchase water-supply systems that are well suited to the size of their holdings. Tubewells, which provide an “optimum system of irrigation” cost between $1,000 and $2,500 each in the 1970s and would have been available only to those with large operations. Together, these factors favour large landowners over those with small holdings.

The advantages that accrued to large landholders resulted in a much higher concentration of land ownership. The value of land increased significantly, and small

265 *Ibid. at 277.*
266 Lappé *et al.*, supra note 153 at 54; *Brown, supra* note 164 at 24-25.
267 *Brown, ibid.* at 96.
269 *Pearse, supra* note 242 at 181.
271 *Brown, supra* note 164 at 25.
272 *Pearse, supra* note 242 at 107.
273 *George, supra* note 1 at 14, 35.
landowners in many countries “could no longer invest in the purchase and improvement of land.”

Exorbitant prices made land sale appealing to many small scale farmers and in many countries, the number of farms decreased. Other small scale farmers lost access to land they cultivated when landowners removed tenants and became direct producers themselves.

These changes in the rural landscape of many developing countries impacted the local populations in other ways. The World Bank and FAO both reported in the 1970s that “smaller holdings and a lower concentration of ownership produced considerably more per acre and employed more people than did large concentrated holdings.”

Furthermore, many of the large landholdings favoured the cultivation of crops for export at the expense of domestic food production. For example, in Brazil the rate of growth of food crops in the period from 1967-1979 was lower than from 1947-1967.

The cultivation of export crops by large landholders helped generate the foreign exchange necessary for the import of pesticides, fertilizers and farm implements. The U.S. encouraged reliance on American products by providing USAID loans for the purchase of American fertilizer, by encouraging American corporations to invest in developing countries through the use of financial incentives and by persuading

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274 Pearse, supra note 242 at 116.
275 Ibid. at 114, 116-117. In Pakistan, for example, land values increased 500% in the first 10-15 years that the Green Revolution was implemented. George, supra note 1 at 102.
276 Pearse, supra note 242 at 163.
278 Lappé et al., supra note 153 at 54.
279 Ademar Ribeiro Romeiro, “Alternative developments in Brazil” cited in Glaeser, supra note 153, 80 at 89.
280 It is worth noting that many of the pesticides exported by American corporations are “banned, heavily restricted or have never been registered for use in the U.S.” Lappé et al., supra note 153 at 51.
281 Brown, supra note 164 at 58.
282 Ibid.
developing countries to minimize barriers to direct foreign investment. The United States and the World Bank “put a great deal of pressure” on this country, among others, “to encourage multinational corporations to invest in local production capacity.” In 1966, while experiencing a severe famine and relying on Food for Peace assistance to feed its population, India was told by the U.S. and the World Bank that it was to receive a significant increase in foreign aid; however, no “firm commitment” was made as the U.S. wanted to see “continued evidence that India means business in her efforts to attract foreign private investment in the fertilizer industry.”

Dependence on agricultural inputs from foreign sources has caused significant problems for developing countries. In addition to ensuring that profits are amassed outside of, rather than within, the developing world, reliance on imports creates instability because production is not under local control. Such was the case during the early 1970s when fertilizer production was dramatically reduced because of surpluses throughout the preceding decade. In countries with production facilities, domestic needs were prioritized over exports. As a consequence, developing countries experienced fertilizer shortages and prices soared. Between 1970 and 1974, the price of 100

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283 Ibid. ESSO established 400 “agro-service” centers in the Philippines that sell fertilizer (from ESSO’s plant in the Philippines), seeds, pesticides and other farm implements. These were “one-stop shopping centres for Filipino farmers.” (Ibid. at 61.)
284 Ibid. at 58.
285 George, supra note 1 at 91.
286 J. Anthony Lukas, “India Expecting 30% Aid Increase” New York Times (14 May 1966) 3. Moreover, the establishment of local production capacities in the developing world has not always been encouraged. The World Bank refused to finance the construction of Algeria’s first fertilizer plant on the basis that the plant would be too large for the country’s needs; Algeria continued with construction regardless and by 1980 it was unable to service even half the country’s demand. See George, supra note 1 at 273.
287 George, ibid. at 267-273.
288 Ibid. at 91, 267-273.
pounds of fertilizer climbed from $3.80 to $9.20. While developing countries struggled to find sufficient inputs for the new plant varieties that had been brought into their countries, fertilizer production companies in developed countries were logging record profits.

C. A Technical Solution

The failure of the Green Revolution to end famine resulted, in part, because early proponents of HYVs did not recognize that “[s]ocial polarity characterizes both context and consequence of technology.” By contrast, the authors of a comprehensive four-year study of HYVs by the U.N. Research Institute for Social Development (UNRISD) based their research “on the belief that technologies and social relations are intimately linked and that a change in technology [is] virtually always associated with a major change in social relations.” A book based on the study concludes that:

[T]he character of a technology and the strategy used to promote its adoption operate very forcefully upon the whole social system, including those factors within it upon which its distributive function depends. The partial, production-oriented view of the green revolutionists inevitably strengthens the dominant groups within the agricultural sector wherever there are pronounced inequalities, which leads to the persistence and generation of poverty for the rural majorities.

After more than a decade of the Green Revolution, its advocates began to recognize some of its social and political impacts. A 1981 review of the CGIAR programs noted that the effects of increased productivity must be considered from a broader perspective.

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289 Ibid. at 117.
290 Ibid. at 271-2.
292 Pearse, supra note 242 at 6. The study, sponsored by the United Nations Development Program, was titled “Global Two”. Pearse, who was a member of the team that wrote the study, based this book on the study’s findings.
293 Ibid. at 217
that includes “social and political phenomena.” In response to criticisms that “farmers [were] losing control of their destinies,” the research centres that operate under the group began to emphasize “farming systems research,” which considered not only demand for inputs and production levels but also environmental and socioeconomic factors. After reviewing more than 50 agricultural projects implemented during the 1970s, the World Bank’s Operations Evaluation Department noted that “the search for technical excellence is often allowed to outweigh a pragmatic assessment of the extent to which new technologies can be absorbed within the socioeconomic and political constraints of many of the institutions for which they are intended.”

This limited recognition that the broader context of social, cultural and political forces must be considered when evaluating the Green Revolution was short-lived. By the mid-1980s U.S. foreign agricultural policy appeared to be focused on “the idea that output problems can be solved through technology rather than through basic changes in social relationships and institutions in rural areas.” Furthermore, after proudly noting that the new plant varieties had finally reached Africa, the USAID Director recently advocated acceleration of the Green Revolution to “address the problem of chronic malnutrition and food insecurity.” The FAO appears to view the impacts of the Green Revolution with a similar fondness. It noted in its recent annual report that “[t]he Green Revolution taught us that technological innovation...can bring enormous benefits to poor

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295 Ibid. at 28-31.
297 Sanford, ibid. at 300-301.
people through enhanced efficiency, higher incomes and lower food prices.” The FAO Director General has made similar remarks, asserting that HYVs should be used to achieve sustainable food security. Unfortunately, these advocates of HYVs fail to acknowledge that, where inequalities persist, technology-based productivity increases do not ensure food security for the rural poor.

III. The Gene Revolution

With the advent of modern agricultural biotechnology, many believe that we are now on the cusp of yet another revolution, this time coined the “Gene Revolution,” that will assist in ameliorating the food security problems and poverty that pervade the developing world. While proponents of agricultural biotechnology strongly advocate its use throughout developing countries, the Gene Revolution has met with considerable resistance from various stakeholders.

The discussion below introduces the Gene Revolution and provides an overview of the current debate regarding the use of agricultural biotechnology to feed the world’s poor. It begins with a description of the science behind agricultural biotechnology, a consideration of the on-going biotechnology debate including the risks and benefits of GM crops and an overview of agricultural biotechnology use throughout the world. The most ardent advocates of agricultural biotechnology are introduced and their position regarding its use in developing countries is outlined. This is followed by a description of the resistance and skepticism with which biotechnology advocates have been met. Finally, the discussion considers a broader set of cultural and socioeconomic concerns that are largely excluded from the mainstream GM debate.

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299 FAO, *State of Food and Agriculture*, supra note 143 at 3.
A. The Science behind Agricultural Biotechnology

The term “biotechnology” refers to any use of living organisms, or substances derived from these organisms, to develop or alter a product for a practical purpose.\(^\text{301}\) This broad term encompasses a variety of processes such as the use of microorganisms for the bioremediation of oil spills, the use of bacteria for the fermentation of beer and, more recently, the genetic engineering of plants to produce desirable crops. Although genetic engineering is only one specialized branch of biotechnology, the terms are often used synonymously. This practice is followed here, as well as in the *Protocol* itself.\(^\text{302}\)

Genetic engineering is the process by which genetic material is transferred from one organism to another without sexual reproduction.\(^\text{303}\) The genetic material found in most animal and plant cells is deoxyribonucleic acid (DNA), a complex molecule that provides the blueprint of an organism. This blueprint is encoded in the form of genes, which are segments of DNA that relay the information for a particular function or trait in that organism. Plant characteristics such as height, girth, insect resistance and tolerance to salinity are all dictated by specific genes. Genetic engineering facilitates the transfer of genes between organisms of the same species and, more remarkably, enables scientists to overcome the reproductive boundaries that exist in nature by transferring genes from one species to another. Genetic engineering may also be used to alter the expression of a gene that already exists within an organism by suppressing it or by increasing the number of copies of the gene to amplify expression. The effect of this engineering is that plants


\(^{302}\) The *Protocol* uses the term “modern biotechnology” to describe genetic engineering. *Supra*, note 5, Article 3(i).

or animals are given new combinations of genes that express novel combinations of traits. The resulting organism is referred to as “genetically engineered,” “genetically modified” or “transgenic.” These terms are not technically identical but they are often used interchangeably as will be done here. Since the genes inserted into a GMO become part of that organism’s DNA, the genes are passed on to the organism’s offspring through natural reproduction.

The development of these methods provides scientists with opportunity limited only by the scope of their imagination and budget. The potential agricultural applications are considerable. Plants could be genetically engineered to improve their tolerance to high soil concentrations of metal or minerals, improve tolerance to other stresses such as drought or frost, make them resistant to viral attack and augment their nutritional value by increasing their vitamin production or their protein content.

Although these and other traits are being tested in laboratories and fields in the United States and elsewhere, the principal traits engineered into commercially available crops are herbicide tolerance and insect resistance. These two traits, inserted into four

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304 These terms are not technically identical but they are often used interchangeably as will be done here. There are several mechanisms by which genetically engineered plants can be created. A biological vector, in the form of a bacterium or virus, may be used to carry foreign DNA into the target organism and insert it into the plant’s genetic material. This is the most common method used and is referred to as a recombinant DNA technique. Alternatively, genetic material can be microinjected into the target cell or projected into the cell using a particle gun in a procedure called “bioballistics.” Pores may also be created in the cell membrane to facilitate direct gene transfer by either bathing the cells in a chemical solution or subjecting them to a weak electrical current. Finally, genetically engineered plants may be created by fusing two cells together to merge their genetic material. See Union of Concerned Scientists, “Genetic Engineering Techniques”, online: Union of Concerned Scientists <http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=345>. The Protocol defines “modern biotechnology” as the application of “nucleic acid techniques including recombinant DNA and direct injection” or cell fusion. Supra, note 5, Article 3(i).

305 Scientists were able to isolate a gene from the bacterium Bacillus thurengiensis (“Bt”) that produces a protein toxic to several kinds of insects and engineer it into the genetic material of certain plants. With this gene as part of their arsenal, GM crops are able to produce the protein and resist insect infestation.
different crops (soybean, maize, cotton and canola), account for 99% of global GM crop production.\textsuperscript{308}

B. Risks versus Benefits

One potential benefit of incorporating herbicide tolerance and insect resistance into plants is a decrease in farmers’ use of herbicides and insecticides to protect their crops. Accordingly, this is one of several examples given by advocates of genetic engineering to support the argument that the technology is more environmentally benign than other agricultural practices. These assertions are countered by those who believe that the environmental and health risks of biotechnology far outweigh the benefits. This debate occurs not only within the scientific community, which remains divided on whether GM plants cause greater harm than good,\textsuperscript{309} but also publicly, in the media and within international institutions. It is a debate that focuses almost exclusively on the potential environmental and health impacts of GMOs.

Proponents of biotechnology frequently argue that it provides a solution to diminishing biodiversity by improving crop yields and reducing the need to plough additional land for food, particularly in developing countries. Crops may be engineered for increased resistance to harsh environmental conditions such as poor moisture content, increased salinity or increased soil metal content, which may also improve yields.\textsuperscript{310} The ability of plants to maximize nutrient uptake from soil can be enhanced, so that the amount of fertilizer used on the crops can be decreased.\textsuperscript{311} When crops engineered for herbicide resistance are planted, weeds can be left unchecked for longer periods before

\textsuperscript{308} FAO, \textit{State of Food and Agriculture}, supra note 143 at 5.
\textsuperscript{310} Per Pinstrup-Andersen & Ebbe Schioler, \textit{supra} note 152 at 54.
\textsuperscript{311} \textit{Ibid.} at 52.
herbicide needs to be administered. This offers numerous benefits, including a reduction in the amount of herbicide that has to be used. The use of GM herbicide resistance may also enable farmers to spray crops less frequently with less toxic herbicides. Likewise, plants engineered with insect resistance produce a natural toxin (Bt toxin) that resists infestation such that farmers no longer have to spray crops with chemical insecticides. Furthermore, GM advocates claim that transgenic plants provide some health benefits, particularly in developing countries. Crops may be modified so that the nutritional value of their edible components is altered. Recent achievements have increased the levels of iron in rice, maize and wheat, and Vitamin A enriched rice has been developed for use in countries where Vitamin A deficiency is widespread.

Those who do not favour the use of biotechnology in agriculture argue that the risks exceed the potential benefits. Significantly, they take issue with claims that GMOs will enable states to preserve biodiversity. Instead, they argue that the planting of GM crops will decrease biodiversity by contaminating natural crops, promoting uniform

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312 Other benefits include the fact that the weeds are good for insects and birds and the fact that the dense weeds diminish the chances that toxins will leach into the soil when sprayed. *Ibid.* at 45.
315 Pinstrup-Andersen & Schioler, *supra* note 152 at 53. Five billion people in the world are iron-deficient, two billion of these suffer from anemia. (*Ibid.* at 61.)
crop systems \textsuperscript{318} and reducing the development and use of traditional crop varieties.\textsuperscript{319} Contamination may lead to the creation of "superweeds" when GM plants containing herbicide-resistance pollinate weeds.\textsuperscript{320} Plants with transgenes may also become increasingly invasive if they are more competitive than other plants.\textsuperscript{321} Critics point to evidence that the use of GM crops does not result in a decrease in the amount of pesticides used on crops.\textsuperscript{322} Moreover, they argue that as with other insecticides, Bt toxin eventually will be rendered ineffective as pests develop resistance.\textsuperscript{323} In the meantime, the production of toxins to control pest infestations may adversely impact non-target wildlife.\textsuperscript{324} There are also risks associated with the development of virus-tolerant crops. These GM plants are produced by engineering components of viruses into plants. There is a risk that these viral components may combine with other viruses that infect the plant to produce new, increasingly virulent viruses.\textsuperscript{325} In addition, GMO critics draw attention to the potential human health risks of these foods. They indicate that the proteins produced by foreign genes introduced into GM plants may have allergenic effects\textsuperscript{326} and raise concerns that GMOs may be toxic.\textsuperscript{327} Scientists have also noted that it is possible,

\textsuperscript{318} Nuffield Council on Bioethics, \textit{supra} note 314 at 103-104.
\textsuperscript{319} Miguel A. Altieri \& Peter Rosset, "Ten Reasons Why Biotechnology Will Not Ensure Food Security, Protect the Environment and Reduce Poverty in the Developing World" (1999) 2:3-4 \textit{AgBioForum}, online: AgBioForum <www.agbioforum.org/v2n34/v2n34a03-altieri.htm>; Murphy, \textit{supra} note 309 at 95-96.
\textsuperscript{320} Altieri \& Rosset, \textit{ibid.}; Nuffield Council on Bioethics, \textit{supra} note 314 at 3, 71-72.
\textsuperscript{321} André de Kathen, "Managing Biosafety Capacity Development: Technical and Political Aspects" in Matin Qaim, Anatole F. Krattiger \& Joachim von Braun eds., \textit{Agricultural Biotechnology in Developing Countries: Towards Optimizing the Benefits for the Poor} (Boston: Kluwer Academic Publishers, 2000) 39 at 50.
\textsuperscript{322} Jane Rissler, "Review of ERS Report" (June 1999), online: Ag Biotech Infonet <http://www.biotech-info.net/rissler_review.html>. See also Lim Li Ching, "GM Crops Increase Pesticide Use" (11 December 2003), online: Institute of Science in Society <http://www.i-sis.org.uk/GMCIPU.php>.
\textsuperscript{323} Nuffield Council on Bioethics, \textit{supra} note 314 at 27.
\textsuperscript{324} GM Science Review Panel, \textit{supra} note 313 at 14.
\textsuperscript{325} Altieri \& Rosset, \textit{supra} note 319. See also Union of Concerned Scientists, "Risks of Genetic Engineering," online: Union of Concerned Scientists <http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=346>.
\textsuperscript{326} GM Science Review Panel, \textit{supra} note 313 at 11.
\textsuperscript{327} \textit{Ibid.} at 61-71.
though unlikely, that foreign DNA from GM food could be integrated into the genome of bacteria in the human digestive tract.\textsuperscript{328}

An additional factor relevant to this debate concerns the environment into which GM crops are introduced. The benefits and risks of transgenic crops must be viewed in light of a particular country’s infrastructure, regulatory framework and the extent of public awareness regarding biosafety. As noted in an extensive study commissioned by the U.K. government, the majority of transgenic crops are currently grown on large-scale farms in geographically isolated areas in a select number of countries.\textsuperscript{329} Thus, caution should be exercised in extrapolating from the experience in these countries to other areas in which the size, type and location of farms may be substantially different.

Furthermore, the study emphasizes the need to evaluate GM crops on a case-by-case basis and to acknowledge, within the ongoing debate, the great number of uncertainties that exist with respect to the effects of these crops.\textsuperscript{330} The study’s authors recognize that there is little evidence demonstrating adverse environmental consequences from GM use but caution that the “[a]bsence of evidence of harm is not evidence of absence of harm.”\textsuperscript{331} They conclude by recommending that regulatory authorities be “sensitive to the degree of risk and uncertainty” that exists and recognize “the distinctive features of GM, divergent scientific perspectives and associated gaps in knowledge.”\textsuperscript{332}

C. Agricultural Biotechnology around the World

Given the contentious nature of the biotechnology debate, it is not surprising that the development of GMOs has met with a wide range of responses from citizens and

\begin{itemize}
  \item \textsuperscript{328} \textit{Ibid.} at 11-12, 100.
  \item \textsuperscript{329} \textit{Ibid.} at 13.
  \item \textsuperscript{330} \textit{Ibid.} at 25.
  \item \textsuperscript{331} \textit{Ibid.} at 22.
  \item \textsuperscript{332} \textit{Ibid.} at 25.
\end{itemize}
governments across the globe. Bans on GM products have been imposed by countries as diverse as Brazil, Sri Lanka, Angola, Sudan and New Zealand. The government of Zambia created headlines in 2002 when it rejected $50 million in U.S. aid that was conditional on the purchase of American GM food products. The European Communities imposed a “de facto moratorium” on GM products in October 1998 that also attracted considerable media attention and sparked a challenge by the world’s leading biotech exporters at the WTO.

In contrast, consumers in the United States and elsewhere have demanded little from their governments in the form of GM regulation. The U.S. has no legislation specifically dealing with GM products and relies on a haphazard and uncoordinated institutional regime to implement regulations. Moreover, GM ingredients have flooded the market and are now estimated to be present in 70% of food products available on grocery store shelves. It is no coincidence that the GM food industry is largely American. Not only is the U.S. a world leader in crop biotechnology research and development, it is also home to the great majority of GM crops grown worldwide. In 2003, the U.S. grew just under two thirds of the globe’s 67.7 million hectares of

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336 U.S., Subcommittee on Research, supra note 298 at 33 (Speaker J. Dennis Hastert).
338 The EU suspended consideration of applications for, or granting of, approval of biotech products under its approval system.
339 Challenges have been brought by Argentina, Canada and the United States. “Index of Disputes Issues,” online: WTO <http://www.wto.org/english/tratop_e/dispu_e/dispu_subjects_index_e.htm#gmos>. This is discussed in greater detail in Chapter 4.
341 U.S., Subcommittee on Research, supra note 298 at 15.
transgenic crops. The remaining one third was distributed unevenly among 17 other countries, most of these contributing marginally to the total. In fact, the U.S. together with Argentina, Canada, Brazil, China and South Africa account for 99% of the global transgenic crop area.

It is worth noting that the percentage of global transgenic crops grown in the United States has been slowly decreasing over the last few years while the contribution of developing countries is on the rise. Yet, the planting of GM crops in the developing world is highly concentrated in only a few states. The failure of the majority of the developing world to embrace crop biotechnology has not gone unnoticed by the United States and is a concern in that country as well as in various international institutions with food security mandates.

D. The Biotech Advocates

Support for the use of agricultural biotechnology as a tool to improve productivity and food security comes not only in the form of rhetoric, official statements and scholarly work, but more significantly, by way of financial and technical support for programs or projects directed at developing countries. Increased agricultural productivity through biotechnology is viewed as an effective means of tackling widespread malnourishment and, by fuelling economic growth and agricultural trade, as a mechanism to alleviate

\[342\] FAO, *State of Food and Agriculture, supra* note 143 at 35-37.
\[344\] *Ibid.* The United States and Argentina together account for 84% of the total. The remaining 12 countries are: Australia, Bulgaria, Colombia, Germany, Honduras, India, Indonesia, Mexico, Philippines, Romania, Spain and Uruguay. (*Ibid.*)
poverty. This is a program of development that advocates claim may “improve living standards,” stimulate investment and provide farmers “barely eking out a living” with a means to move beyond subsistence farming.\(^349\)

Agricultural biotechnology’s strongest global advocate is the United States. Former Secretary of Agriculture, Ann Veneman, noted at a recent symposium on the use of agricultural science for African development that of all the technologies available to assist in this task “biotechnology has captured the most headlines”\(^350\) because it “holds such enormous promise.”\(^351\) She has also noted that “dwindling options for land and water resources and increased population and environmental stresses make it imperative that we emphasize biotechnology.”\(^352\) This sentiment was echoed by the Chair of the Subcommittee on Conservation, Credit, Rural Development and Research of the U.S. House of Representatives when he remarked that he could “think of few technologies that provide as much hope for the future as biotechnology.”\(^353\)

To this end, the U.S. has invested significantly through agencies such as the National Science Foundation (NSF), the USDA and USAID in the spread of biotechnology throughout the developing world. The NSF has been mandated to award grants for genetic engineering research that assists developing countries and the USDA

\(^{348}\) World Bank, Development Indicators, supra note 147 at 301.

\(^{349}\) Veneman, “U.S. Contribution”, supra note 155.


\(^{351}\) Ibid.

\(^{352}\) Ann M. Veneman, “U.S. Contribution.”, supra note 155[emphasis added].

supports multiple research and development programs overseas. USAID has been
involved in advancing genetic engineering techniques for more than a decade. This
type agency “supports research, informs decision-makers, helps countries formulate
regulations, and funds public outreach to promote the safe use of biotechnology in
developing countries.” USAID’s Initiative to End Hunger in Africa, initiated at the
World Summit on Sustainable Development, links research institutions in the U.S. and
Africa and endeavours to adapt biotechnology to local needs and make it accessible to
African farmers. The U.S. government also promotes agricultural biotechnology at
international gatherings where food security is on the agenda. The U.S. delegation
lobbied vigorously for language in support of genetically engineered crops to be included
in the final declaration of the 2002 Summit. It achieved some success when the 2002
Summit parties agreed that they “are committed to study, share and facilitate the
responsible use of biotechnology in addressing development needs.”

Not only the government, but also private organizations within the U.S. facilitate
the development of agricultural biotechnology in the developing world. The Rockefeller
Foundation funds a number of biotechnology initiatives, some of which are collaborative
projects with USAID. Among other things, the Rockefeller Foundation funds efforts to
develop rice varieties suited to the needs of developing countries, address intellectual
property issues that arise through the use of biotechnology and develop and implement
biosafety programs. Private company leaders within the industry, such as Monsanto,

356 *Declaration of the World Food Summit: Five Years Later* (2002), online: FAO
357 Gesa Horstkotte-Wesseler & Derek Byerlee, “Agricultural Biotechnology and the Poor: The Role of
also fund programs that assist the spread of this technology to developing countries.

Monsanto has also engaged in publicity campaigns that assert that genetic engineering is needed to feed the world’s hungry.\(^{358}\)

Endorsement of agricultural biotechnology as a means of combating food insecurity also exists at the international level. At its 2003 summit, the G8 pledged to encourage development of biotechnology for use in developing countries.\(^{359}\) Likewise, the World Bank claims that biotechnology offers one of the “best opportunities” to reduce poverty.\(^{360}\) The potential of genetic engineering also receives considerable attention from U.N. agencies. At the Global Biotechnology Forum (GBF), an international gathering of experts, industry representatives, non-governmental organizations and government delegations held under the auspices of the United Nations Industrial Development Organization (UNIDO), participants acknowledged that “the GBF provided valuable inputs into the U.N. wide effort to spread the benefits of biotechnology to the developing countries, and in particular, will contribute towards the Secretary General’s system-wide integrated framework for biotechnology development.”\(^{361}\) The advantages of biotechnology in the enhancement of food security were also recognized in *Agenda 21*,\(^{362}\) a non-binding agreement adopted at UNCED in Rio de Janeiro in 1992.

The most extensive discussion of biotechnology within the U.N. occurs under the auspices of the FAO. In 2003-2004, this organization’s annual report, *The State of Food

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358 These campaigns have targeted the European public and African heads of state, with little success. These campaigns are discussed more fully in the next section of this chapter.


360 World Bank, *Development Indicators*, supra note 147 at 301.


362 Online: UNEP <http://earthwatch.unep.net/agenda21/>.
and Agriculture, was dedicated entirely to the topic of agricultural biotechnology and its use in meeting the needs of “resource-poor farmers” is described as “immense”\textsuperscript{363} and the report emphasizes that “[b]iotechnology should form part of an integrated and comprehensive agricultural research and development programme that gives priority to the problems of the poor.”\textsuperscript{364}

Though the proponents of biotechnology use in developing countries are diverse, their message is uniform: in those regions of the world where malnutrition, poverty and food insecurity are widespread, genetic engineering simply must be a central component of development strategies. As noted by the former U.S. Secretary of Agriculture at a symposium on African development, “[n]o region of the world has more to gain from the opportunities that modern agricultural science and technology can offer. And no region of the world has more to lose if this opportunity is allowed to slip away.”\textsuperscript{365}

E. Resistance and Skepticism

Despite the views of the Secretary of Agriculture, and the assurances of influential governments and organizations that biotechnology must play a key role in tackling poverty and food insecurity, advocates of genetic engineering are confronted with significant resistance, skepticism and occasionally, outright rejection, from all corners of the globe. Not only have these responses been geographically widespread, but they are expressed by a diverse collection of concerned parties. Several governments have imposed bans on the cultivation of GM crops or the import of GM food aid\textsuperscript{366} and

\textsuperscript{363} FAO, State of Food and Agriculture, supra note 143 at 91.
\textsuperscript{364} Ibid, at 5.
\textsuperscript{365} Veneman, “Effective Use of Agricultural Science”, supra note 350.
others have criticized biotechnology in public statements. Scientists who have become activists in the GM debate have called for a moratorium on GM crops or have challenged the notion that biotechnology is an indispensable component of food security. Non-governmental organizations have voiced criticism of this new technology and the manner in which it is being spread to the developing world and farmers’ groups have protested the spread of GM to developing countries. Most often, concerns are expressed by peaceful demonstrations, written campaigns, diplomatic exchanges or the development of national policy. In other instances, resistance and protest have led to more tragic results. This could be said of the choice made by the President of Zambia to deny import of GM food aid during a drought that threatened millions in his country with severe food shortages and of the decision by a South Korean farmer to fatally stab himself in protest at the WTO summit in 2003.

Resistance to biotechnology is most frequently framed in terms of concerns about the potential environmental and health impacts of GMOs. However, the potential social, economic and cultural impacts of biotechnology are also highlighted and the presumption

368 A group of 136 scientists from 27 countries signed the World Scientists’ Statement that calls for a moratorium on GM crops and a prohibition on the granting of patents for living organisms, cell lines and genes. The statement notes that the benefits of GM crops have not yet been proven but there is growing scientific evidence that they cause hazards to the environment, human and animal health. “World Scientists’ Statement: Calling for a Moratorium on GM Crops and Ban on Patents” (21 October 1999), online: Third World Network <http://www.twnside.org.sg/title/world-en.htm>.
371 For a discussion of the nature of the farmers’ protests see John Vidal, “Farmer commits suicide at protests” The Guardian (11 September 2003), online: Guardian Unlimited <http://www.guardian.co.uk/wto/article/0,2763,1039709,00.html>.
that genetically engineered crops will enable food security is questioned. This was the case when over 670 organizations and 800 individuals representing more than 80 countries wrote a scathing letter to the Director General of the FAO after the release of its 2003-2004 State of Food and Agriculture report on agricultural biotechnology and the needs of the poor. The letter expressed outrage at what it referred to as a “politically-motivated public relations exercise to support the biotechnology industry.” It emphasized that the nature of the remedy proposed by the FAO, described as a “technological fix,” is ill-suited to the food insecurity problem, which is one of poor access and distribution. Moreover, the signatories pointed out that “ignoring the...social and structural underpinnings of hunger” by focusing on a technological solution may, in fact, exacerbate the socioeconomic imbalances that contribute to food insecurity. It is argued that the report ignores “evidence of the adverse ecological, economic, and health impacts of genetically engineered crops,” endorses the use of technology that prevents farmers from saving and re-using seed from year to year and inadequately addresses the problem of corporate domination of the biotechnology industry.

A similarly ardent response was made in June 1998 by the African delegates to the 5th Extraordinary Session of the Commission on Genetic Resources in reply to a

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372 “FAO Declares War on Farmers Not on Hunger: An open letter to Mr. Jacques Diouf, Director General of FAO” (16 June 2004), online: GRAIN <http://www.grain.org/front_files/fao-open-letter-june-2004-final-en.pdf>. A list of the organizations and individuals who have signed the letter is provided on this website.
373 Ibid.
374 Ibid.
375 Ibid.
376 The only delegate that didn’t sign the letter was the representative from South Africa. The letter was signed by 23 delegates representing the following 17 states: Cameroon, Benin, Senegal, Cote d’Ivoire, Democratic Republic of the Congo, Madagascar, Burundi, Ethiopia, Sudan, Mozambique, Chad, Rwanda, Algeria, Zambia, Lesotho, Morocco and Angola.
publicity campaign by Monsanto that promoted biotechnology as a means of feeding the world’s hungry. The African representatives strenuously objected to “the image of the poor and hungry from our countries...being used by giant multinational corporations to push a technology that is neither safe, environmentally friendly, nor economically beneficial to us.”\textsuperscript{378} In response to Monsanto's campaign request that Europeans give an “unconditional green light to gene technology,” the African representatives stated that:

\begin{quote}
We do not believe that such companies or gene technologies will help our farmers to produce the food that is needed in the 21st century. On the contrary, we think it will destroy the diversity, the local knowledge and the sustainable agricultural systems that our farmers have developed for millennia and that it will thus undermine our capacity to feed ourselves.\textsuperscript{379}
\end{quote}

According to these leaders, biotechnology is not viewed as an “imperative” element of the fight against food insecurity, as advocated by proponents of GM crops, but rather as a hindrance.

F. A Broader Set of Concerns

The lesson of the Green Revolution is that the relative success of a particular agricultural technology is dependent upon the economic, social, political and cultural environment into which it is introduced. The socioeconomic inequalities that existed at the time of the Green Revolution continue to shape the environment into which biotechnology will be introduced. Therefore, it is reasonable to question whether the new seeds will be accessible and affordable to all farmers, whether those who choose not to use biotech (or who are unable to obtain it) will be disadvantaged, whether increases in

\textsuperscript{377} This organization operates under the auspices of the FAO. It’s mandate is to “[review] and [advise] FAO on policy, programmes and activities related to the conservation, sustainable use and equitable sharing of benefits derived from the utilization of genetic resources of relevance to food and agriculture.” Commission on Genetic Resources for Food and Agriculture, online: FAO <http://www.fao.org/ag/cgrfa/default.htm>.

\textsuperscript{378} “Nature’s Harvest”, supra note 367.

\textsuperscript{379} Ibid.
productivity will translate into increased food security for local populations and whether cultivation of GM crops\textsuperscript{380} will require less labour in countries where employment is in short supply.\textsuperscript{381}

The fact that agricultural biotechnology is predominantly a developed country phenomenon, undertaken by private industry for profit, raises several concerns. Dependence upon foreign companies (or governments) for agricultural inputs may inhibit, rather than promote, food security.\textsuperscript{382} As countries learned through their experiences with the Green Revolution, "[a]ny choice of technology automatically means also the choice of its supplier."\textsuperscript{383} These multinational company (MNC) "suppliers" favour their own interests (profit) over those of recipient developing countries.\textsuperscript{384}

American MNCs have no financial incentive to develop GM varieties of subsistence crops. As a consequence, biotechnology research largely ignores the particular needs of the developing world.\textsuperscript{385} The FAO notes that developing country "[s]tate food crops have been the subject of very little applied biotechnology research" and "agronomic traits of particular importance to developing countries and marginal production areas...are the subject of very few field trials in industrialized countries and even fewer in developing countries."\textsuperscript{386}

\textsuperscript{380} This is particularly true of herbicide resistant crops.
\textsuperscript{381} Nuffield Council on Bioethics, \textit{supra} note 314 at 4.32.
\textsuperscript{382} Thus, when Venezuela’s ban on GM crop cultivation was announced, an adviser to the President noted that "[i]f we want to achieve food sovereignty, we cannot rely on transnationals like Monsanto." Tockman, \textit{supra} note 366.
\textsuperscript{383} George, \textit{supra} note 1 at 73.
\textsuperscript{385} Nuffield Council on Bioethics, \textit{supra} note 314 at 4.83 (noting that the main staples of Africa’s food-poor, millet, sorghum and yams, are "largely untouched by GM technology.") See also FAO, \textit{State of Food and Agriculture}, \textit{supra} note 143 at 35.
\textsuperscript{386} FAO, \textit{ibid}.
The industry-driven nature of biotechnology research also raises the contentious issue of intellectual property protection. Although considered necessary for stimulating research and development in developed countries, intellectual property rights have not been well-received in the developing world. Historically, these countries have resisted patent protection for living organisms or their genetic components on a number of grounds.  

One particularly contentious issue regarding the patenting of living organisms arises because of the manner in which biotech companies ensure compliance with their intellectual property rights. When biotech companies patent GM seeds, they often enter a contract with the farmer in which the latter agrees not to save seed for re-use from year to year; often the agreement also contains provisions allowing the biotech company to randomly test the farmer’s fields to ensure adherence to the terms of the contract. To avoid this administrative hassle, companies developed terminator technology. This patented procedure manipulates the plant’s genetic code and sterilizes its seeds to prevent a second generation of plants from germinating.\(^{388}\) In either case, farmers are forced to purchase new seeds each year for cultivation. Eliminating the ability of farmers to save seeds at the end of a year’s harvest disrupts a cultural practice relied upon by 80% of farmers in developing countries.\(^{389}\) It also positions control of the global food supply in the hands of a dwindling number of foreign-owned MNCs.\(^{390}\)

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\(^{389}\) Pinstrup-Andersen & Schioler, *supra* note 152 at 136. A Mexican indigenous community member notes that, “Our seeds, our corn, is the basis of the food sovereignty of our communities. It’s much more than a
The existence of this broader set of concerns is largely ignored by advocates of the Gene Revolution, as it was with proponents of the Green Revolution. Although mention is sometimes made of the social, economic and cultural implications of biotechnology, or the "complex phenomena"\textsuperscript{391} that cause poverty, it is absent any detailed discussion. Moreover, advocates argue that sound science (to the exclusion of other considerations) must govern decision-making regarding biotech.\textsuperscript{392} Such a policy precludes consideration of the broader impacts of biotechnology in regulatory or trade decisions.

In some instances biotech advocates attempt to discredit those who place the biotech debate in a broad context. For example, the director of USAID recently responded to a concern "that accepting biotechnology crops will make African farmers dependent on multinational companies" by noting that "this is sort of part of the anti-globalization hysteria that we hear, that we have seen in some of the multilateral institution meetings."\textsuperscript{393} He continued by stating that:

\begin{quote}
[I]f we start developing seed varieties that are in the public domain, which, in fact, is what we are doing in many of these countries, it is not a matter of multinational corporations. So this is really an illusion and I think it is a rhetorical excess to argue that multi-nationalism in terms of the international economy is going to somehow make Africa dependent.\textsuperscript{394}
\end{quote}

\textsuperscript{390} Major consolidations among plant biotechnology companies have been occurring over the last few years, among and between local companies and large multinational agrochemical companies. In Brazil, for example, Monsanto took over the ownership of 82\% of the country’s previous domestic hybrid maize seed industry in a single year. Robert L. Paarlberg, \textit{The Politics of Precaution: Genetically Modified Crops in Developing Countries} (Baltimore: Johns Hopkins University Press, 2001) at 70. See also FAO, \textit{Ethical Issues}, \textit{supra} note 149. A Monsanto representative noted to the U.S. Congress recently that his company is “one of the largest and highest quality seed producers on the African Continent.” U.S., \textit{Subcommittee on Research}, \textit{supra} note 298 at 138 (Dr. Robert B. Horsch).

\textsuperscript{391} U.S., \textit{Subcommittee on Research}, \textit{ibid.} at 56 (Andrew S. Natsios).

\textsuperscript{392} \textit{Ibid.} at 36 (Chairman Smith). Veneman, “U.S. Contribution”, \textit{supra} note 155; Veneman, “Effective Use of Agricultural Science”, \textit{supra} note 350; FAO, \textit{State of Food and Agriculture}, \textit{supra} note 143 at 88.

\textsuperscript{393} U.S., \textit{Subcommittee on Research}, \textit{supra} note 298 at 58 (Andrew S. Natsios).

\textsuperscript{394} \textit{Ibid.}

food, it’s part of what we consider sacred, of our history, our present and future.” ETC Group, “Contamination by genetically modified maize in Mexico much worse than feared” (9 October 2003), online: ETC Group <www.etcgroup.org/article.asp?newsid=410>.
What the USAID Director neglected to point out is that public research plays a minor role in the development of GM seed varieties for the developing world (with the exception of China). As noted by the FAO, “[f]ew developing countries or international public-sector institutions have the resources to create an independent source of biotechnology innovations.”\textsuperscript{395} The research and development budget of the CGIAR, which is “the largest international public-sector supplier of agricultural technologies” is $300 million or one tenth that of the “world’s top ten transnational bioscience corporations.”\textsuperscript{396} As a consequence, not a single commercialized GM crop outside of China has been the product of the public sector.\textsuperscript{397}

Although many biotech advocates may agree that “Africans and other third world countries need to make their own decisions”\textsuperscript{398} regarding the use of biotechnology, this does not seem to be a primary component of their approach. The Speaker of the U.S. House of Representatives described decisions made by some developing countries to reject biotech as “protectionist trade policies...brought on by emotion, culture, or their own poor industry”\textsuperscript{399} and noted that rejection of GM food aid by African leaders “borders on genocide.”\textsuperscript{400} Moreover, advocates depict biotechnology as a critical component of development while other agricultural methods are ignored or rejected as alternatives.\textsuperscript{401} These views are at odds with the notion that developing countries have a

\textsuperscript{396} FAO, State of Food and Agriculture, \textit{ibid.}
\textsuperscript{397} \textit{Ibid.}
\textsuperscript{398} U.S., Subcommittee on Research, supra note 298 at 59 (Andrew S. Natsios).
\textsuperscript{399} \textit{Ibid.} at 27 (Speaker J. Dennis Hasten).
\textsuperscript{400} \textit{Ibid.} at 29.
\textsuperscript{401} For example, the FAO notes that technology is necessary as many developing world farmers “remain trapped in subsistence agriculture.” FAO, State of Food and Agriculture, supra note 143 at 8.
right to choose the development and food policy strategies that they believe are most appropriate for their citizens.

IV. Conclusion

Although the technology that is at the core of the Gene Revolution may certainly be regarded as revolutionary, there is something all too familiar with the approach being advocated.402 As noted by one commentator, “[i]n spite of decades of obvious failure to solve the world food crisis, most ‘experts’ continue to proceed as if solutions for it could be purely technical – and Western-sponsored.”403

As we have seen, there is reason to be skeptical about the suitability of such an approach for developing countries. Technical solutions aimed at increasing productivity do not address the root causes of poverty and malnutrition and, in circumstances where gross socioeconomic inequalities exist, they may actually aggravate them. Moreover, many of the states that advocate these approaches are responsible for policies that exacerbate poverty in the developing world. These states, which have demonstrated that their self-interest guides food aid policies, stand to benefit tremendously from the adoption of biotechnology in developing countries. For these reasons, one must view the Gene Revolution from a broad perspective - one that encompasses concerns not adequately addressed in the science-based GM debate with which most North Americans and Europeans are familiar.

402 The G8 refers to advances in biotechnology as a “second green revolution” that would “raise agricultural productivity, promote hardier crops for healthier people, and make food insecurity in Africa a thing of the past.” G8, “Ending the Cycle of Famine in the Horn of Africa, Raising Agricultural Productivity, and Promoting Rural Development in Food Insecure Countries” (2004), online: University of Toronto <http://www.g8.utoronto.ca/summit/2004seaisland/famine.html>.
403 George, supra note 1 at 107.
CHAPTER III - NEGOTIATION OF THE CARTAGENA PROTOCOL ON BIOSAFETY

The preceding chapter reveals that developing countries' attitude toward biotechnology and biosafety has been shaped, in large part, by decades of experience with issues relating to international trade, food aid, technology use, food security and the policies of developed countries. This unique perspective of developing countries was apparent throughout the negotiation of the Protocol; these countries voiced a distinct set of concerns, fears and expectations that diverged significantly from those expressed by the developed world. This chapter traces these differing views, and the conflicts they generated, throughout the Protocol's negotiation.

I. Introduction

The development of the Protocol was a lengthy process. It began in the late 1980s, when states negotiating the text of the Convention on Biological Diversity considered whether the agreement should encompass biotechnology and biosafety issues. Ultimately, a provision was included in the Convention calling on states to consider "the need for and modalities of a protocol...in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology." Several years after the Convention had come into force, the Parties established a working group charged with the task of drafting a protocol on biosafety. After four years of difficult negotiations, the working group finalized the text of the Protocol at Montreal in January 2000. Since then, the Parties have continued to meet in various fora to develop guidelines for implementation of the agreement and to settle certain issues left unresolved in the Protocol's text.

404 Supra note 5, Article 19(3).
The Protocol was preceded by other efforts at incorporating biotechnology and biosafety into international instruments. *Agenda 21*, which was adopted at UNCED, calls upon states to ensure that biotechnology is developed and implemented in an environmentally sound manner that promotes development. Standards for foods derived from biotechnology have been developed under the auspices of the Codex Alimentarius Commission*⁴⁰⁵* and biosafety guidelines have been established by various organizations including UNIDO, the OECD⁴⁰⁶ and the United Nations Environment Programme (UNEP). Among these instruments, however, only the Protocol provides legally binding obligations. Its status as the first binding instrument on biosafety was partly responsible for its protracted negotiation. The development of the Protocol was also made particularly challenging given the polarized nature of the debate over GMOs, the lack of experience by the majority of the international community with biotechnology and biosafety issues and the fact that biosafety regulation straddles the legal disciplines of intellectual property, trade, human rights and the environment. In view of these challenges, it was no small feat that countries were able to conclude the Protocol and obtain the fifty ratifications necessary to bring it into force.

The aim of this chapter is to provide an overview of the negotiating history of the Protocol and to highlight the most significant challenges and conflicts faced by the Parties throughout the process. It begins with a summary of the biosafety discussions that took place during the negotiation of the Convention and during the first and second Conference of the Parties (COP) to the Convention. The chapter then moves to a history

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*⁴⁰⁵* The Codex Alimentarius Commission was developed in the 1960s by the FAO and the World Health Organization.
*⁴⁰⁶* See Biosafety Information Network and Advisory Service, online: BINAS Online <http://binas.unido.org/binas/regs.php>.
of the work undertaken by the Biosafety Working Group (BSWG), which was established at the second COP and given the task of drafting the *Protocol*. After a summary of the first meeting of the BSWG the discussion proceeds thematically, tracing the evolution of the major elements of the *Protocol* through the five additional meetings of the BSWG and the first Extraordinary COP (ExCOP).

Throughout the entire negotiation process, several fundamental issues served as the main sources of conflict for the negotiating states. One of the key issues that arose repeatedly was the general scope of the agreement. Developing countries in particular sought to maximize the category of LMOs, scope of activity and physical territory regulated by the *Protocol*. These countries wanted to maximize the *protection* and *choice* offered to importing countries via the agreement. This was countered by a strong trend from developed countries, particularly the primary biotech exporters, to narrow the scope of the agreement. Most often, this was expressed as a desire to interfere as little as possible with the mechanisms of the WTO regime. The conflict between protection of the environment and the maintenance of a liberalized trade regime was, therefore, a considerable source of tension between biotech exporters and biotech importers throughout the negotiations. It resulted in constant debate regarding the nature of decision-making under the *Protocol*, with biotech exporters calling for a science-based regime and biotech importers demanding a precautionary approach. Developing countries added an additional layer to this debate by demanding that protection of socioeconomic well-being also serve as a basis of decision-making under the *Protocol*. As will become apparent from the overview below, many of these conflicts remained
unresolved during the negotiation and were either woven into the text of the Protocol itself or left for later resolution.

II. Convention Negotiations

A. Negotiations Prior to UNCED

States negotiated the Convention over the course of several years with the aim of having it available for signature by the 172 governments participating at UNCED in 1992. Early discussions about the Convention took place at gatherings of the UNEP Governing Council; however, the bulk of negotiations took place at meetings of the UNCED Preparatory Committee (PrepCom) and the Intergovernmental Negotiating Committee for a Convention on Biological Diversity (INC).407

The topic of biotechnology was a contentious one from the outset of negotiations. Developing countries, desiring equitable access to the technologies derived from their genetic resources, refused to support a convention that excluded biotechnology. The U.S. forcefully opposed its inclusion.408 Many other developed countries409 argued that biotechnology issues, presumably those relating to benefit sharing, should not be considered together with the issue of biodiversity conservation.410 Although these aspects of the biotechnology/biodiversity conflict were left unresolved at PrepCom 1,411

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407 The INC actually began as the Ad Hoc Group of Legal and Technical Experts, but that body was renamed after it had met twice. As a consequence, the first meeting of the INC is sometimes referred to as its third meeting. Here, the meetings of the INC have been numbered one through five.


409 The many countries that relied on the resolution belong to a group referred to in the U.N. as “Western Europe and Others” (WEOG). The “Others” are: Australia, New Zealand, Canada and the U.S.

410 McConnell, supra note 408 at 20.

411 The conflict over benefit sharing and access to technology continued for much of the negotiation. At the Second INC the parties were able to agree that the Convention would recognize “that technology includes biotechnology.” This language found its way into Article 16 of the Convention, which deals with access to and transfer of technology.
states were able to agree on the need for a report on the safety aspects of biotechnology.\textsuperscript{412}

At the first and second INC, the European Community and the G77 offered support for provisions dealing with biosafety.\textsuperscript{413} The U.S. maintained its resistance to any discussion of biotechnology, arguing that it was “no more dangerous” than other forms of technology and that biosafety measures might impede international trade.\textsuperscript{414} Japan echoed the sentiments of the U.S. Both of these states remained adamantly opposed to biosafety considerations at the third INC; the U.S. even advised other parties that it would propose measures “guaranteeing market freedom for all technology, including biotechnology.”\textsuperscript{415} The remaining states focused their efforts on biosafety and by the end of INC-3 there was a “general feeling” that the issue might best be addressed in a protocol.\textsuperscript{416}

By the fourth INC, countries were focusing on a system of prior informed consent and on the need to adopt a precautionary approach. The U.S. and Japan continued to reject any provision that would threaten the well-being of the biotechnology industry, but failed to offer alternative text when prompted by other states. Finally, the Netherlands and Denmark offered a compromise provision that called on states to consider “the need for and modalities of a protocol” on the safe handling of GMOs.\textsuperscript{417} To the surprise of many observers, this suggestion was accepted by the U.S. at the fifth and final INC with the proviso that the reference to “genetically modified organisms” be changed to “living

\textsuperscript{412} McConnell, supra note 408 at 20.
\textsuperscript{413} Ibid. at 47, 60.
\textsuperscript{414} Ibid. at 47, 61.
\textsuperscript{415} Ibid. at 66.
\textsuperscript{416} Ibid. at 66.
\textsuperscript{417} Ibid. at 73.
modified organisms.”\footnote{418} This change was in line with the U.S. position that biotechnology posed no unique threat as compared with traditional breeding. The language suggested by the U.S. was intended to “underscore that genetic engineering was not the source of concern.”\footnote{419} The U.S. also agreed that the text could refer to “advance informed agreement” but not “prior informed consent.”\footnote{420} Since the phrase “prior informed consent” had arisen in negotiations under the \textit{Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal},\footnote{421} the use of “advance informed agreement” was intended to remove any suggestion that biotechnology was akin to hazardous waste or chemicals.\footnote{422} With these changes, Article 19(3) of the \textit{Convention} was finalized as follows:

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The Parties shall 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 resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.\footnote{423}
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\textbf{B. Negotiations Following Adoption of the Convention}

\textit{i. From Rio to the First COP}

The \textit{Convention} was signed by 156 states and the European Community at UNCED.\footnote{424} Soon after, UNEP established a panel of experts to develop a plan of action...
for implementation of Article 19. The panel met three times over the course of two years and prepared a report outlining the advantages and disadvantages of a biosafety protocol. The panel was particularly concerned about the “absence of regulations regarding the safety of transgenic organisms transferred from countries with knowledge and experience in biotechnology issues to countries without.”

Discussions regarding the need for a protocol continued in two meetings of the Intergovernmental Committee on the Convention on Biological Diversity (ICCBD) held in October 1993 and June 1994. Delegates raised topics like the need for advance informed agreement (AIA), a clearing-house mechanism for the exchange of information and capacity-building in developing countries. Some states noted that the protocol should be “based on existing scientific work” prepared by organizations like the FAO. Other states raised issues like the ethical and socioeconomic implications of biotechnology. While some states indicated that the COP should establish a “step-by-step process” for consideration of the need for a protocol, the majority (including the G77 and China) argued that work on a protocol should commence immediately. There was general agreement that the protocol should be on the agenda of the first COP.

The first COP to the Convention took place in late November and early December 1994. Parties continued to debate whether a legally binding biosafety protocol was necessary; however, the G77 and some other countries believed that the question of whether a protocol was needed had already been decided and that states should be

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427 Ibid.
moving on to the issue of modalities. Some states suggested that interim guidelines could be prepared until a protocol was negotiated; others argued that there should be a moratorium on GMOs until a protocol was finalized. There was concern expressed that non-Parties to the Convention were having too much influence over the biosafety discussions.

Throughout the meeting, there was considerable support for the idea that a group be established to assist the COP. Accordingly, Decision 1/9 of the COP created an “open-ended” ad hoc group of experts, to be nominated by governments, which would consider “the need for and modalities of a protocol” and report back to COP-2. The group of experts would also consider “existing knowledge, experience and legislation in the field of biosafety, including the views of the Parties, subregional, regional and international organizations.” In order to assist the open-ended ad hoc group of experts, the Parties agreed to establish a panel of 15 experts (the “Panel”) that would prepare a background document based on “a consideration of...existing knowledge and experience on risk assessment and management, and guidelines and/or legislation already prepared.”

 ii. The Expert Meetings

*Meeting of the Panel of Experts*

The Panel met in Cairo at the beginning of May 1995 and outlined its two-fold mandate as follows: (1) to consider existing knowledge and experience on risk

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432 Ibid. at para. 5.
433 Ibid. at para. 7.
434 The panel members were selected to ensure an equitable geographical representation of the Parties.
assessment and management with respect to LMOs, and (2) to consider options and recommendations on the need for and modalities of a biosafety protocol. A background paper was prepared for the open-ended ad hoc group of experts with a summary of the Panel’s findings and recommendations in these areas.

The Panel defined risk assessment as “the use of scientific data to identify and characterize the nature and magnitude of hazards...and the likelihood of hazards being realized” and outlined various aspects of LMOs that may be relevant to risk assessment (including potential for weediness, adverse effects on ecosystems, etc.). The focus on science-based assessment reflected the Panel’s view that “objective parameters” should be used to gauge risk. The Panel noted that socioeconomic effects may impact decision-making processes but indicated that these concerns “bring value judgments into the analysis which inevitably vary among countries and communities and from case to case depending on considerations other than the nature of the technologies themselves.”

In outlining a future action plan for states, the Panel noted that “the assessment and management of risks arising from the development and use of LMOs... is not fundamentally different from that used in other technologies.” Accordingly, risk assessment methods that are already in place may be used to evaluate LMOs. The Panel noted, however, that these methods must be made available in more languages and must take into account a greater range of environmental conditions in order to provide

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436 Ibid. at para. 24.
437 Ibid.
438 Ibid. at para. 64.
guidance to a broader range of states. It also advised that expert advice on the environmental effects of LMOs will be needed in order to assess risks and that a precautionary approach is appropriate to control risks and ensure safety. The need for capacity-building was emphasized by the Panel. It warned that “because of the lack of adequate financial and human resources” in developing countries, these states will face a conflict “between the use of scarce resources to access and benefit from the technologies on the one side, and the scientific and technical support needs of biosafety regulation on the other.”

With respect to the need for a protocol, the Panel pointed out that many states have not yet adopted domestic biosafety regulations and that “immediate action” is needed for some mechanism of LMO oversight. Moreover, the Panel stated that domestic regulations alone are insufficient as they do not address transboundary issues. Action is needed to address transboundary movements of LMOs and to establish an “accepted standard of care for control of transboundary movements.”

Meeting of the Open-Ended Ad Hoc Group of Experts on Biosafety

A few months after the Panel had completed its work, representatives of 83 countries, the European Community and over 30 intergovernmental and non-governmental organizations met in an open-ended ad hoc group to consider its report. The group’s mandate was to: (1) consider existing knowledge, experience and legislation in the field of biosafety and (2) to consider the need for and modalities of a protocol.

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439 Ibid. at para. 70.
440 Ibid. at para. 76.
441 Ibid. at para. 78.
442 Decision I/9, supra note 431 at paras. 3, 5.
Specifically, the group was directed to set out appropriate procedures, including AIA, for the safe transfer, handling and use of LMOs.\(^443\)

With respect to the first part of its mandate, the group noted that the Panel’s report provided a good summary of the existing knowledge, experience and legislation relevant to biosafety. Some representatives indicated that the experience gained thus far was incomplete given that LMOs have not been released in all climatic and environmental conditions. Moreover, the group noted that “the lack of technical, financial and institutional capacity in many developing countries is an impediment in addressing biosafety.”\(^444\) Finally, it was noted that existing regulations address neither the transboundary movements of LMOs nor the socioeconomic and ethical aspects of biotechnology.

In addressing the second aspect of its mandate, the group noted the “immediate need for international action” in the area of biosafety to “ensure safety for human health and the conservation and sustainable use of biological diversity.”\(^445\) It agreed that the action taken should be based on the precautionary approach, take into account scientific considerations, apply a technical/scientific methodology to risk assessment and address the different behaviour of LMOs in different environments. The great majority of delegates advocated the negotiation of a biosafety protocol and suggested that COP-2 establish a working group to undertake this task.\(^446\)

\(^{443}\) *Ibid.* at para. 3.


\(^{446}\) Some Parties did not favour immediate action and instead suggested a step-wise approach to the development of a biosafety protocol.
In order to assist with the development of a protocol, the open-ended ad hoc group adopted a text outlining “Elements for the Content of an International Framework for Biosafety.” Delegates were able to agree on nine issues that should be addressed within the framework including: all activities related to LMOs that may have adverse effects on the conservation and sustainable use of biodiversity; transboundary movements; the release of LMOs in centres of origin; risk assessment and risk management; AIA, exchange of information; capacity-building; implementation mechanisms; and definitions of terms (the “Consensus Items”). Three additional issues received support from many delegations, particularly developing country representatives from Africa, but did not achieve consensus: socioeconomic considerations; liability and compensation; and financial issues (the “Non-Consensus Items”). The text outlining both sets of Items, in addition to the other findings and recommendations of the group, were forwarded to COP-2 for consideration.

iii. The Second COP

By the time the Parties gathered for the second COP, there was general agreement that a biosafety protocol was needed and that the negotiating process should begin immediately. The Parties focused efforts on the establishment of the BSWG, as suggested by the G-77 and China, which would be responsible for negotiating the elements of a draft protocol. There was considerable dispute, however, regarding the scope of the protocol and the relevant terms of reference of the working group. Southern countries wanted a broad agreement that extended to all issues relating to the “safe

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447 The U.S., however, advocated discussions to “develop a framework for deciding whether the need for a protocol is established.” (1995) 9:39 Earth Negotiations Bulletin at 8. This comment was made during the Ministerial segment of COP-2.
448 Also referred to as the Open-Ended Ad Hoc Working Group.
transfer, handling and use of LMOs.” 449 In contrast, Northern countries wanted a protocol that was restricted to issues regarding the “transboundary transfer of any LMO.” 450 After significant debate, the Parties were able to settle on “a negotiation process to develop, in the field of the safe transfer, handling and use of [LMOs], a protocol on biosafety, specifically focusing on transboundary movement.” 451

The Parties then turned to the remaining elements of the working group’s mandate. 452 They directed the BSWG to “elaborate” the elements of a protocol based on the Consensus Items and to consider the inclusion of the Non-Consensus items “as appropriate.” 453 The working group was instructed to explain key concepts, consider the “form and scope” of AIA and identify relevant categories of LMOs. 454 The COP stipulated that the protocol was to take into account the precautionary approach, seek to “minimize unnecessary negative impacts on biotechnology research” and ensure that “access to and transfer of technology” is not “unduly” hindered. 455 Moreover, the process of developing the protocol was to be conducted in a manner that reflects the goal of obtaining “the largest possible number” of ratifications. 456

III. The BSWG Process and the Extraordinary COP

The BSWG met six times between July 1996 and February 1999, pursuant to decisions of the COP. At the end of the last meeting, held in Cartagena, delegates

450 Ibid.
451 Consideration of the need for and modalities of a protocol for the safe transfer, handling and use of living modified organisms, COP Dec. II/5 (1995) at para. 1, online: Convention on Biological Diversity <http://www.biodiv.org/decisions/?m=cop-02> [Decision II/5].
452 Note that the terms of reference for the BSWG, attached as an Annex to Decision II/5, ibid. refer to the group being composed of representatives “nominated by Governments”. This meant that membership in the Group was not restricted to Convention Parties.
453 Decision II/5, supra note 451, Annex at para. 2.
454 Ibid., Annex at para. 3.
455 Ibid., Annex at para. 5.
completed a draft protocol and submitted it to an ExCOP for adoption by the Parties. After two days of difficult negotiation, delegates could not break the impasse that persisted and the ExCOP was suspended.\footnote{Before disbanding, however, the Parties agreed that the protocol would be called the “Cartagena Protocol on Biosafety.” See Secretariat of the Convention on Biological Diversity, \textit{The Cartagena Protocol on Biosafety: A Record of the Negotiations} at 12 \textit{[Record of Negotiations]}. The issues over which the parties could not agree were: trade matters, commodities and domestic/international regulatory regimes. Although the EU proposed a compromise agreement that received support from the Like-Minded Group and the Central and Eastern European Group, it was rejected by the Miami Group and the ExCOP had to be suspended. See (1999) 9:117 Earth Negotiations Bulletin at 1, 3.} The meeting was reconvened a year later in Montreal (“Resumed ExCOP”) after the Parties had expressed their commitment to conclude a protocol in three interim informal consultations. At the beginning of the Resumed ExCOP, several of the negotiating groups remained fundamentally at odds on some issues.\footnote{Hagen & Weiner, \textit{supra} note 4 at 701.} After considerable effort, however, the deadlock was broken and the \textit{Protocol} was finalized in the early morning hours of January 29, 2000.

More than one hundred governments,\footnote{Ibid.} joined by representatives of non-governmental organizations and the biotech industry, participated in the BSWG negotiations.\footnote{The number of participants stayed relatively constant until BSWG-6 when it was expected that a draft protocol would be finalized and sent to the ExCOP for adoption. At BSWG-6 and the ExCOP there were over 600 participants, including representatives from 138 governments, “business and environmental NGOs and the scientific community.” The number of industry representatives increased significantly at these particular meetings. (1999) 9:117 Earth Negotiations Bulletin at 1.} Early in the process negotiating groups formed along regional and geopolitical lines. As negotiations progressed, however, rifts within the G77/China, the Group of Latin American and Caribbean Countries (GRULAC) and WEOG began to surface.\footnote{(1997) 9:74 Earth Negotiations Bulletin at 10.} By the end of meetings in Cartagena, the groups had reorganized and five solid negotiating blocs had formed.\footnote{Gupta, “Biosafety Regime”, \textit{supra} note 73 at 210.} The Miami Group consisted of states that are, or
hope soon to be, leading biotech producers and exporters: the U.S., Canada, Australia, Uruguay, Argentina and Chile. This group advocated a scientifically-based regime with narrow application that is subordinate to the WTO agreements. The Like-Minded Group, comprised of the members of the G77 plus China (excluding Argentina, Uruguay and Chile), was the largest of the blocs and called for a broad protocol that encompassed the precautionary principle, liability provisions and socioeconomic considerations. The positions of the remaining blocs, the Central and Eastern Europe (CEE) Group, the EU Group and the Compromise Group (Switzerland, Norway, Japan, Mexico, New Zealand, Singapore and South Korea), fell somewhere in between the polarized views of the other two.

Negotiations during the BSWG meetings took a range of forms. Delegates met in plenary sessions for general discussion, but most of the detailed work and drafting took place in much smaller groups. Two Sub-Working Groups (SWGs) met during the last four BSWG meetings to discuss the core articles of the Protocol. Additionally, Contact Groups were used from BSWG-3 through to the ExCOP to consider more focused issues like definitions, scope, institutional matters and commodities. In later meetings, a Legal Drafting Group and Drafting Group on Liability and Redress were also used to assist in drawing up the Protocol. At BSWG-6, small groups with representatives from the regional blocs referred to as the “Friends of the Chair” and “Friends of the Minister” assisted with the negotiation of particularly contentious issues. Many believed that

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463 Since it has not ratified the Convention, the U.S. had observer status only during the BSWG negotiations.
464 This group included representatives of the G-77/China, JUSSCANZ (Japan, the U.S., Switzerland, Canada, Australia, Norway and New Zealand), the EU and the CEE group. (1999) 9:110 Earth Negotiations Bulletin at 1.
465 This group consisted of representatives from the Like-Minded Group, the Miami Group, the EU and Japan. (1999) 9:115 Earth Negotiations Bulletin at 1.
negotiations in these small groups “left many countries out of the loop” and objections were raised regarding the lack of transparency and democracy.\textsuperscript{466}

Complaints about the negotiation process at BSWG-6 led the President of the ExCOP, Minister Mayr, to make some changes.\textsuperscript{467} At the ExCOP he utilized a working group with one representative from each of the CEE group, Central America and the Caribbean, the EU and the Compromise Group, two representatives from the Miami Group (one from the North and one from the South) and four representatives from the Like-Minded Group.\textsuperscript{468} Many delegates from developing countries commented that this “proposed composition for the working group rectified the unbalanced representation of the previous consultations.”\textsuperscript{469} At the second informal consultation, President Mayr used a negotiation strategy that came to known as the “Vienna setting.” Representatives of the five negotiating groups sat at a table with advisors and other delegations observing from behind them.

The delegates were initially guided in their negotiations by the report of the Open-Ended Ad Hoc Group of Experts on Biosafety and its formulation of Consensus and Non-Consensus Items. By the end of BSWG-3 a draft consolidated text had been prepared and delegates spent the remaining BSWG meetings revising, adding to and removing provisions from that text. The following paragraphs describe this process in more detail, beginning with the early negotiations at BSWG-1 and continuing with a discussion of the main provisions of the Protocol as they were developed through the remaining BSWG meetings.

\textsuperscript{469} Ibid.
A. The First Meeting of the BSWG

The first meeting of the BSWG was an opportunity for delegates to state their positions on the Consensus and Non-Consensus Items and on biosafety more generally. Discussions revealed that in many instances, delegate positions were diametrically opposed to one another.\(^470\) Nonetheless, governments made submissions on the possible structure of a protocol and by the end of BSWG-1 a working paper had been assembled.

During the meeting, delegates raised a number of significant issues that would form the basis for negotiations throughout the BSWG process. With respect to the Consensus Items, the subject of AIA received the most consideration. Some of the concerns that arose included the need to: avoid undue barriers to “commercialization”\(^471\) and ensure consistency with the WTO;\(^472\) ensure that the regulations imposed on LMOs are proportional to the degree of risk they pose;\(^473\) allow the importing country to be the final judge of risk assessment;\(^474\) ensure that procedures are guided by trade, human health and environmental concerns;\(^475\) and balance disclosure of information with protection of intellectual property rights.\(^476\) Delegates also discussed the need for a capacity-building provision. Developing country representatives led the way, pointing out that they lack the financial resources\(^477\) and the capacity for risk assessment/management.\(^478\) One state

\(^{470}\) For example, the Biotechnology Industry Organization representative argued that the protocol should be based on the principle of substantial equivalence, which regards like products as subject to the same standard regardless of the manner in which they were produced. In contrast, the African group noted the inherent potential dangers of biotechnology and products thereof. \textit{Ibid.} at 7, 9.

\(^{471}\) \textit{Ibid.}

\(^{472}\) \textit{Ibid.}

\(^{473}\) \textit{Ibid.}

\(^{474}\) \textit{Ibid.}

\(^{475}\) \textit{Ibid.}

\(^{476}\) \textit{Ibid.}

\(^{477}\) \textit{Ibid.}

\(^{478}\) \textit{Ibid.} at 6.
stressed that the pace of biotechnology innovation exceeds the development of
developing countries’ biosafety capacity.⁴⁷⁹

The Non-Consensus Items also received considerable attention, particularly from
developing countries that advocated their inclusion in the protocol.⁴⁸⁰ States made
various suggestions regarding potential liability schemes. With respect to socioeconomic
considerations, delegates noted potential concerns including genetic erosion, preservation
of culture,⁴⁸¹ agricultural substitution⁴⁸² and the disproportionate impacts of technology
on wealthy and poor farmers.⁴⁸³ One state suggested the need for social impact
assessment within the protocol.⁴⁸⁴

During the course of these discussions, disagreement over the need for liability and
socioeconomic provisions caused tensions within the G77. Eventually, the states of
GRULAC split from the remaining countries in the G77⁴⁸⁵ and supported a protocol that
excluded these issues.⁴⁸⁶ The position of most developed countries paralleled that of
GRULAC.⁴⁸⁷ Japan objected to the inclusion of liability and socioeconomic provisions,
noting that the mandate of the BSWG was to negotiate a protocol that will attract the
greatest number of ratifications possible.⁴⁸⁸ Switzerland and Canada noted that

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⁴⁷⁹ The state was Sudan. *Ibid.*
⁴⁸⁰ In fact, Malaysia requested a paper from the Secretariat on many issues relating to socioeconomic
considerations. It was agreed that a bibliography of literature dealing with these issues would be provided
to the delegates at BSWG-2.
⁴⁸⁴ The state was Sri Lanka. *Ibid.* at 5.
⁴⁸⁵ Although all developing countries were no longer aligned in one negotiating bloc, the terms “South” and
“developing countries” are used interchangeably with “Like-Minded Group” by ENB writers. This seems
appropriate given that this negotiating group represented the overwhelming majority of countries in the
developing world.
socioeconomic considerations should be addressed domestically\textsuperscript{489} and Poland stated that the BSWG was an inappropriate forum for their consideration.\textsuperscript{490} Australia and the EU argued that socioeconomic concerns exceeded the mandate of the BSWG to deal with "transboundary" movements.\textsuperscript{491} As a consequence, the Non-Consensus items from the Open-Ended Ad Hoc Working Group of Experts remained on a list of items included in some, but not all, country proposals for the protocol.

B. Specific Issues

i. Scope

The proper scope of the protocol was a contentious issue that impacted the negotiation of a significant number of provisions within the agreement. One aspect of this debate had already been the subject of much discussion at COP-2: whether the protocol should cover all uses of LMOs or just transboundary movements. This issue was raised again at BSWG-2 along with two other matters relevant to the scope of the protocol. The first was whether it should apply to the products of LMOs, which were referred to by the delegates as "products thereof." The second was whether the protocol should consider risks to human health in addition to risks to biological diversity. Some delegates also sought exclusions from the protocol for certain types of LMOs including those in transit and those intended for research or contained use.\textsuperscript{492} Generally, developing countries sought the broadest protocol possible\textsuperscript{493} while many developed countries attempted to restrict its application.\textsuperscript{494}

\textsuperscript{489} \textit{Ibid.}
\textsuperscript{490} \textit{Ibid.}
\textsuperscript{491} \textit{Ibid.}
\textsuperscript{493} See e.g. Federal Democratic Republic of Ethiopia Environmental Protection Authority, "Draft Protocol to the Convention on Biological Diversity: Safety in Biotechnology" (1996), online: Ag Observatory [http://www.agobservatory.org/library.cfm?refID=29557] [\textit{African Draft Protocol}]. This draft protocol
These issues didn’t receive a lot of attention again until BSWG-5. At that meeting, the discussion of “products thereof” was passed on to a Contact Group for detailed review. Delegates agreed that the protocol should cover intentional and unintentional LMO movements but differed on whether movement of “processed products containing dead LMOs” and movement of “purified products from LMOs” should also be included. This conflict continued at BSWG-6 and the ExCOP, where it played a role in the collapse of negotiations.

Many delegates continued to seek exclusions for certain LMOs, including those that are destined for contained use and those in transit. Additional exclusions were added to the draft article on scope including LMOs unlikely to have negative impacts on the conservation and sustainable use of biodiversity and those used as pharmaceuticals. Some progress was also made on the issue of health impacts of LMOs. Many countries were appeased by including the phrase “taking into account risks to human health” after references to “adverse impacts on biological diversity” throughout the protocol.

During the informal consultations and the Resumed ExCOP, further adjustments were made. Developing countries suggested that the article on scope contain a broad

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497 Ibid. at 4.
500 Protocol, supra note 5, Article 4.
statement of applicability and that the exclusions form their own provisions. This
suggestion was adopted and two new articles were inserted into the Protocol excluding
LMOs that are: (a) pharmaceuticals “addressed by other relevant international agreements
or organizations” and (b) destined for contained use or in transit. Both of these
articles mention that they are “without prejudice to any right of a Party to subject all
[LMOs] to risk assessment prior to the making of decisions on import.” Delegates were
also able to agree to include “products thereof” in the information share provision and
Annexes 1 and 3 dealing with AIA and risk assessment respectively. With these
modifications, the Parties adopted the relevant provisions.

ii. Transboundary Transfer Mechanisms

Negotiations

The AIA procedure is the core of the Protocol. As a result, the development of the
AIA provisions was complex and often overlapped the negotiation of many other
elements within the Protocol. Early in the process, the most significant overlap was with
discussion of the Protocol’s scope. In fact, a single draft article dealt with both
application of the AIA and scope until it was split at BSWG-4.

Delegates raised many concerns regarding the AIA procedure at BSWG-2 and
BSWG-3. Some argued that the information provided for AIA should be very detailed
and encompass matters like safe disposal, intended uses and effects on human health and

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501 Informal Consultations Regarding the Resumed Session of the Extraordinary Meeting of the Conference
of the Parties (1999), online: International Institute for Sustainable Development
502 Ibid., Article 5.
503 Ibid., Article 6.
504 Ibid., Article 20.
505 Record of Negotiations, supra note 457 at 30.
the environment.\footnote{506}{(1997) 9:67 Earth Negotiations Bulletin at 5.} By BSWG-3 an annex with notification requirements for AIA had been added to the draft protocol.\footnote{507}{Record of Negotiations, supra note 457 at 123.} Delegates remained undecided on who would trigger the notification procedure and be responsible for the accuracy of information provided.\footnote{508}{Ibid. at 32. The African proposal obliged the state of export to act as “surety” for the accuracy of the information. See African Draft Protocol, supra note 493.}

Other matters that were considered with respect to AIA included: the time frame that would be imposed for acknowledgement of notification and decision-making by the importing state;\footnote{509}{(1997) 9:67 Earth Negotiations Bulletin at 6.} whether the importing state could request additional information;\footnote{510}{Ibid. at 50.} and who could initiate the review of a decision.\footnote{511}{Compilation of the Views of Governments on the Contents of the Future Protocol, UNEP/CBD/BSWG/2/2 (1997) at 21 cited in Record of Negotiations, supra note 457 at 44.}

The subject of risk assessment also arose during these early meetings. Australia noted the importance of this type of assessment, Switzerland advocated its inclusion in the protocol and the African group proposed that it serve as the basis of decision-making.\footnote{512}{Ibid. at 123.} The African group’s suggestion was later adopted by the Parties and included in the Protocol. Soon thereafter, an annex outlining risk assessment parameters was added to the draft agreement.\footnote{513}{Ibid. at 123.}

Most of the issues raised in the early BSWG meetings were still the subject of discussion at BSWG-4 and BSWG-5. Delegates continued to raise new matters as well. The issue of who would ensure the accuracy of information provided under AIA requirements was discussed again, this time with the added concern of who would finance the collection of information and the completion of a risk assessment.\footnote{514}{(1998) 9:82 Earth Negotiations Bulletin at 1.}
Developing countries argued the Party of export should bear these burdens. With respect to the scope of the information required, it was suggested that the requirements of risk assessment should be kept to a minimum. Some developing countries indicated their preference for specific, rather than general guidelines, and advocated the inclusion of non-scientific criteria like socioeconomic and agronomic considerations. Parties debated the applicability of the precautionary principle and included bracketed text on this subject in the risk assessment and decision-making provisions.

At BSWG-5, the Parties were able to agree that a Party of import can specify, in advance, cases in which transfers would be subject to a simplified AIA procedure. Moreover, draft text provided that a review of decisions made by the Party of import should be permitted where there is a change in circumstances, additional scientific information is provided, or there is reasonable evidence that the decision was not based on scientific (or other) principles. This last option was deleted in later meetings.

At BSWG-6, the Parties settled on timeframes for acknowledgement of notification and rendering of decisions by the Party of import. They also agreed that the Party of export should ensure, by way of a legal requirement, the accuracy of AIA information provided by the exporter.

Much conflict remained with respect to the responsibility for completing and financing the risk assessment. Parties also couldn’t agree on whether risk assessment

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516 Ibid.
517 Record of Negotiations, supra note 457 at 51.
520 Ibid.
521 Ibid. at 5-6.
should consider impacts to human health and socioeconomic well-being. These issues were transferred to the Friends of the Chair for further consideration. The resulting Chair’s text proposed that the Party of import could require the exporter to carry out risk assessment and that the costs could be passed to the notifier if the Party of import requested it. These suggestions were later adopted by the Parties and incorporated into the Protocol. Discussions regarding health impacts and socioeconomic considerations in other small groups resulted in the inclusion of the former, but not the latter, in the risk assessment provisions.

Two very contentious issues were the focus of much of the debate at BSWG-6 and the ExCOP. The first was the presence of the precautionary principle within the protocol. Parties agreed to reference the “precautionary approach” in the preamble, but remained divided on whether additional references should be included in the substantive provisions of the agreement. Developing countries, the CEE, the EU and the Compromise Group wanted precautionary language included in the AIA provisions whereas the Miami Group wanted to limit it to the preamble. This debate continued into the Resumed ExCOP where it was transferred to a Contact Group for detailed discussion. After considerable debate, the Parties agreed to include precautionary language in the AIA decision-making provisions and in the risk assessment annex.

The second contentious issue was the applicability of AIA to “commodities” or LMOs intended for food, feed or processing (LMO-FFPs). Although this issue had been raised in earlier BSWG meetings, it was not discussed in depth until BSWG-6. Several

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524 Ibid.
525 Ibid.
527 Protocol, supra note 5, Articles 10(6), 11(8), Annex III.
developed countries argued that only those LMOs intended for direct release into the environment should be covered by AIA.\textsuperscript{528} Developing countries and the CEE advocated for the inclusion of all LMOs in the AIA procedure, noting that LMO-FFPs may be introduced into the environment through accidental release or planting.\textsuperscript{529}

Many attempts at compromise were made during the ExCOP. The Chair’s text suggested that LMO-FFPs be covered by domestic regulations\textsuperscript{530} and the Like-Minded Group recommended that the Party of import be permitted to decide whether AIA would apply.\textsuperscript{531} These suggestions were not accepted. A last ditch attempt at compromise was made by the EU just prior to the collapse of the ExCOP: it proposed that the matter be left to the first COP to decide.\textsuperscript{532} This suggestion received support from all Parties except for those within the Miami Group. As a result, the matter had to be addressed at the Resumed ExCOP. There, the Parties were finally able to agree on a solution suggested by the Compromise Group during the informal consultations. The Protocol would include a separate article excluding LMO-FFPs from the AIA procedure and establishing an alternative mechanism for regulating their transboundary movement.\textsuperscript{533} With that change, one of the most contentious issues in the negotiation was resolved and the AIA and LMO-FFP articles were adopted.

\textit{Finalized Procedures}

Although the description above gives an overview of the main issues that arose during negotiation of the transboundary transfer mechanisms for LMOs covered by the

\begin{itemize}
\item \textsuperscript{528} (1999) 9:117 Earth Negotiations Bulletin at 5.
\item \textsuperscript{530} UNEP/CBD/BSWG/6/L.2 (1999), Article 5 cited in \textit{Record of Negotiations}, supra note 457 at 30.
\item \textsuperscript{532} \textit{Ibid.}, Annex II.
\item \textsuperscript{533} \textit{Protocol}, supra note 5, Article 11.
\end{itemize}
Protocol, it doesn’t provide a clear outline of the way in which these mechanisms work. Accordingly, both the AIA procedure and the alternate mechanism for LMO-FFPs are described in greater detail below.

For LMOs intended for introduction into the environment, the AIA procedure requires exporting Parties to provide notification of a transboundary movement to the importing Party prior to shipment. As part of the notification, the exporting Party must provide information regarding, *inter alia*, the characteristics, intended use, methods for safe handling, regulatory status and centre of origin of the LMO. The importing Party has 90 days to acknowledge receipt of the notification and to indicate whether the exporter should proceed according to the Party of import’s domestic regulatory framework (which must be consistent with the Protocol) or the decision procedure outlined in Article 10 (described here). Within 270 days, the importing Party must provide written notice of its decision to the exporting Party. The notice may indicate that the importing Party approves the import (with or without conditions), prohibits the import, seeks additional information or has extended the period of time required to make a decision.

Decision-making under the AIA procedure must be in accordance with a risk assessment. Risk assessments must be undertaken in a “scientifically sound manner”

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534 This refers to the regulatory status in the Party of export.
535 Notification is provided to the “competent national authority” of the importing state. This is a body, designated by the state, that is “responsible for performing the administrative functions” of the Protocol. *Protocol, supra* note 5, Article 19(1).
536 Within this 90 day period the importing state must also inform the exporter whether it may proceed with its transboundary transfer without further consent or must wait for written consent to be provided from the importing state. *Ibid., Article 10(2).*
537 *Ibid., Articles 9(2)(c), 9(3).*
538 *Ibid., Article 10(3).*
539 *Ibid., Article 10(1).*
in accordance with guidelines provided in Annex III of the Protocol.\footnote{Ibid., Article 15(1).} The objective of the risk assessment is to assess the potential adverse environmental effects of LMOs, taking into account risks to human health.\footnote{Ibid., Annex III at para. 1} Precautionary language arises in the guidelines for risk assessments, indicating that lack of scientific knowledge or consensus will not necessarily be interpreted as indicating a particular risk or absence of risk.\footnote{Ibid., Annex III at para. 4.}

The Protocol provides a mechanism for review of decisions regarding the transboundary transfer of an LMO. The Party of import may review and change a decision based on “new scientific information” on the potential adverse effects of the LMO on biodiversity.\footnote{Ibid., Article 12(1). Note that the actual language of the Protocol here is “potential adverse effects on the conservation and sustainable use of biological diversity”. It has been abbreviated throughout this chapter in the interest of simplicity.} The exporting Party may request a review of an importing Party’s decision where the former believes there has been a change of circumstance that may impact the risk assessment for the LMO or where additional scientific information has become available.\footnote{Ibid., Article 12(2).}

The mechanism in the Protocol for regulation of the transboundary transfer of LMO-FFPs differs significantly from that described above. Under this procedure, information is not passed directly from the exporting Party to the importing Party. Rather, once a Party makes a decision regarding domestic use of an LMO that may be exported for direct use as food or feed, or for processing, they are obliged to inform the Parties to the Protocol via the Biosafety Clearing House (BCH).\footnote{If a Party does not have access to the BCH, it may request that a copy of the information be provided to it in writing. Moreover, any Party may request additional information. Ibid., Articles 11(1), (3).} The Protocol provides a list of information that is to be provided to the BCH once a domestic decision
has been made including, *inter alia*, the characteristics, centre of origin, approved uses and suggested methods for safe handling of the LMO.\(^{546}\) As with the AIA procedure, the exporting Party must ensure the accuracy of information provided through the BCH.\(^{547}\) A decision regarding the import of LMO-FFPs may be based on a Party’s domestic regulatory framework (that is consistent with the objective of the Protocol) or, if it is a developing country Party or Party with an economy in transition without a domestic regulatory framework, on the basis of a risk assessment.\(^{548}\) Decision-making for LMO-FFPs may also be precautionary in nature.\(^{549}\)

### iii. Socioeconomic Considerations

Throughout the negotiations, the issue of the socioeconomic impacts of biotechnology created considerable tension between countries of the South and those of the North. Developing countries were ardent advocates of incorporating socioeconomic considerations into the protocol. The African proposal at BSWG-2 referenced the adverse social and economic effects of biotechnology in the preamble and in the provisions on objectives, general obligations, AIA, risk assessment/management, liability and exchange of information.\(^{550}\) It also included a separate provision dealing exclusively with socioeconomic impacts.\(^{551}\) Most developing countries argued that decision-making and risk assessment should be based, in part, on socioeconomic and ethical considerations. Moreover, they placed considerable pressure on developed countries to give this issue attention. When a request was made for a report on commodities, the G77 indicated that it would only consent if a study was also conducted on the socioeconomic

\(^{546}\) *Ibid.*, Annex II.

\(^{547}\) *Ibid.*, Article 11(2).


\(^{549}\) *Ibid.*, Article 11(8).

\(^{550}\) *African Draft Protocol, supra* note 493, Preamble, Articles 1, 3, 4, 7, 10, 17, 20, Annex 2.

impacts of biotechnology and the impacts of biotechnology on indigenous farming.⁵⁵² This stalled the original request. Parties were later able to agree that, in place of detailed studies, roundtable discussions on commodities and socioeconomic impacts would be held at BSWG-3.⁵⁵³

At BSWG-3 and BSWG-4, states outlined their positions on socioeconomic impacts more clearly and spent considerable time debating the matter. Many developing countries from Asia, Africa and the South Pacific maintained their position that the protocol should contain a provision on socioeconomic considerations and that these concerns should play a role in risk assessment.⁵⁵⁴ Colombia argued that socioeconomic impacts should be contained within the AIA and Belarus argued they should also be linked to liability.⁵⁵⁵

In contrast to the developing country position, Japan argued that socioeconomic considerations should not be in the substantive provisions of the protocol and that they should be dealt with by domestic regulations instead.⁵⁵⁶ The EU stated its belief that they would be more appropriately dealt with in an international instrument dealing with sustainable development generally, such as Agenda 21.⁵⁵⁷ Russia argued that socioeconomic impacts should be dealt with in bilateral agreements rather than in the protocol.⁵⁵⁸ Many developed countries argued that the complexity of socioeconomic impacts makes “implementation of such a provision impractical.”⁵⁵⁹ One industry representative opposed the inclusion of socioeconomic concerns within the protocol,

⁵⁵³ Ibid. at 12.
⁵⁵⁵ Ibid. at 3.
⁵⁵⁶ Ibid. at 3.
⁵⁵⁷ Ibid.
⁵⁵⁸ Ibid.
arguing that G77 demands set a very high “fee” for entry into the realm of biotechnology.  

Developing countries continued with their demands at BSWG-5, arguing that a protocol without socioeconomic considerations would be “unacceptable.” Some of the concerns they raised included: protecting the public from biotech monopolies, protecting moral interests, notifying of import substitution, ensuring financial and technical assistance to countries impacted by import substitution, genetic erosion and consequent loss of income and dislocation of farmers. Some delegations wanted a paragraph included that encouraged research on socioeconomic impacts. Generally, developed countries were amenable to including socioeconomic considerations in the preamble of the protocol but they resisted their inclusion in substantive provisions.

At BSWG-6, little progress was being made on whether to include socioeconomic impacts in the objective of the protocol so the matter was referred to the Friends of the Chair. In that forum, delegates agreed to remove the reference. Language on socioeconomic impacts was also removed from the preamble and the risk assessment annex. Parties agreed to amend the provision on socioeconomic considerations by removing reference to assistance for countries impacted by import substitution. They also agreed to retain the text on researching socioeconomic impacts. At this point, the provision stated that “parties may take into account socioeconomic implications of adverse impacts on biodiversity, including risks to human health and regard for

563 Ibid.
566 Ibid.
indigenous and local communities, when deciding on imports.” A second clause
“encourages research on socioeconomic impacts...including the need for early warning
systems to alert indigenous and local communities that may be affected economically.”567
This text was still not agreeable to all Parties, however, and debate on these matters
continued.

After considerable negotiation, additional changes were made. Parties were able to
take into account socioeconomic considerations in decision-making as long as their
actions were “consistent with their international obligations.”568 The word “adverse” was
removed from the reference to “adverse impacts” of LMOs and the mention of “risks to
human health” was deleted.569 The first paragraph of the provision directed Parties to
consider socioeconomic impacts on the conservation and sustainable use of biological
diversity, “especially with regard to the value of biological diversity to indigenous and
local communities.”570 The reference to early warning systems was removed. Instead,
the clause encouraging research remained in the article with the added proviso that
special attention would be paid to impacts “on indigenous and local communities.”571
With one minor addition at the Resumed ExCOP,572 the provision on socioeconomic
considerations was finalized and adopted by the Parties.

iv. Trade Issues

Perhaps the most contentious issues that arose during the negotiation were those
related to trade. Delegates struggled in their attempts to balance trade and environmental
concerns to everyone’s satisfaction. They discussed three specific trade-related

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569 Ibid.
570 Ibid.
571 Ibid.
provisions: non-discrimination, trade with non-Parties and the protocol’s relationship to other international agreements. As with other particularly controversial issues, the trade-related provisions could not be finalized at the ExCOP and were the subject of debate at the informal consultations and the Resumed ExCOP a year later.

Most of the trade-related discussion among the delegates took place at the later BSWG meetings; however, some early comments revealed that the issues would be particularly difficult to resolve. At BSWG-2, the African group advocated a ban on any LMO exports to, or imports from, non-Parties. Several states, including Japan, Australia and Argentina argued that the protocol must be consistent with the WTO. Norway suggested that although consistency should be maintained, an exception could be made in circumstances where there is “serious damage or threat to biological diversity.”

Some discussion of these issues continued at BSWG-3 and BSWG-4. Bracketed text regarding the protocol’s relationship with other agreements contained three options: a reference to Convention Article 22 (“Relationship with Other International Conventions”); a provision ensuring consistency between the protocol and the WTO agreements, but with the exception proposed by Norway at BSWG-2; and a provision that subordinates the WTO agreements to the protocol to the extent of any inconsistency.

With respect to the issue of non-Parties, delegates also had three options available to them: no provision in the protocol on this issue; a provision banning trade with non-Parties; and a provision allowing “non-discriminatory trade” if consistent with the

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573 African Draft Protocol, supra note 493, Article 5.
575 Record of Negotiations, supra note 457 at 110.
576 Ibid.
protocol. In addition to these two trade-related matters, delegates raised the additional issue of non-discrimination. Whereas some Parties argued that such a provision was unnecessary, others (including Argentina and Australia) suggested language providing that “Parties shall not discriminate between imported [LMOs] and those produced locally.”

At BSWG-5, a strong South-North divide emerged with respect to all of the trade-related matters. Most developing countries argued against a provision on non-discrimination, noting that the protocol is an environmental agreement and that these types of issues should be discussed at the WTO. Most developed countries countered that many of the topics dealt with under the protocol relate directly to trade. Developing countries wanted a provision banning trade with non-Parties, but developed countries argued that this would constitute an improper interference with normal trade. Compromise text was inserted into the agreement encouraging non-Parties to adhere to the protocol and to contribute relevant information on LMOs to the BCH. On the issue of the protocol’s relationship to other agreements, several developed countries wanted text that ensured compatibility with the WTO. Most developing countries favoured deleting the article, noting that the protocol’s relationship to other instruments is already dealt with under international law. Several countries stated that if the provision was

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577 Ibid. at 75.
578 Ibid. at 114.
580 Ibid.
582 Ibid.
583 Ibid.
included, it should provide for primacy of the protocol in circumstances where there is serious threat to biodiversity.\textsuperscript{584}

Of all the trade-related issues, only the provision dealing with non-Parties was resolved at BSWG-6.\textsuperscript{585} Delegates debated this issue for some time, with those in favour of a ban on trade with non-Parties arguing that it would encourage states to join the protocol.\textsuperscript{586} Others countered that it would actually have the opposite effect, dissuading non-Parties from joining.\textsuperscript{587} They also argued that the provision was "unrealistic"\textsuperscript{588} and that it may spark a legal challenge under the WTO. Eventually, many Parties withdrew their support for the ban\textsuperscript{589} and this text was removed from the draft protocol.\textsuperscript{590} Delegates were able to agree on language that requires transboundary movements of LMOs between Parties and non-Parties to be consistent with the objectives of the Protocol.\textsuperscript{591} The text encouraging non-Parties to adhere to the Protocol and to share appropriate information was retained.

The provision on non-discrimination was the subject of much debate at BSWG-6. Some wanted it included in order to clarify the position of non-Parties to the WTO.\textsuperscript{592} Other delegates wanted to get rid of it because it engaged trade concepts.\textsuperscript{593} The Chair

\textsuperscript{585} Note that trade-related issues also arose at BSWG-6 in the context of the provision on socioeconomic considerations. This is discussed in the section above dealing with that provision.
\textsuperscript{587} Ibid.
\textsuperscript{588} Ibid.
\textsuperscript{591} Ibid.
\textsuperscript{592} Ibid. at 8.
\textsuperscript{593} Ibid.
attempted to assist the delegates in reaching a compromise, but it wasn’t until high-level consultations at the ExCOP that Parties agreed to delete the article.\textsuperscript{594}

Resolving the issue of the protocol’s relationship with other international agreements provided the biggest challenge for the Parties. At BSWG-6, discussion of a “savings clause” that would subordinate the protocol to the WTO agreements in certain circumstances caused a fracture among the developed countries.\textsuperscript{595} No agreement could be reached. During the informal consultations, negotiating groups outlined their positions.\textsuperscript{596} The Miami Group argued that the protocol should be consistent with other agreements and should include a savings clause acknowledging other obligations. The EU stated that rights and obligations need to be defined in a manner that is consistent with other agreements; however, it also noted that maintaining consistency “establishes an implicit hierarchy.”\textsuperscript{597} The CEE Group argued that the protocol should not be subordinated to any other agreement and the Like-Minded Group noted that either a superior or subordinate protocol could be detrimental. It advocated a middle ground. Having listened to the various positions of the negotiating groups, Chair Mayr suggested that the article on relationships be deleted and three preambular paragraphs be inserted instead. These paragraphs would provide that: other international agreements are also relevant to sustainable development; trade and environment agreements should be mutually supportive; and the protocol and other relevant international agreements are of equal status.\textsuperscript{598} The Chair’s suggestion received some support from the negotiating

\textsuperscript{594} Record of Negotiations, supra note 457 at 115.
\textsuperscript{596} Informal Consultations, supra note 501.
\textsuperscript{597} Ibid.
\textsuperscript{598} Record of Negotiations, supra note 457 at 16.
groups, but it did not appease them entirely.\textsuperscript{599} Debate continued and the delegates eventually reached agreement on their own three preambular paragraphs.\textsuperscript{600} The first borrowed from the language of Chair Mayr and recognized that trade and environment agreements should be mutually supportive. The second emphasized that the Protocol shall not imply a change in a Party’s rights and obligations under another international instrument. The final paragraph notes that the aforementioned paragraph is not intended to subordinate the Protocol to other agreements.

v. \textbf{Capacity-Building}

Throughout the negotiations, capacity-building was considered to be one of the key provisions of the protocol by developing countries. The draft agreement submitted by the African group at BSWG-2 included both a capacity-building article and an international cooperation article.\textsuperscript{601} Topics addressed in these two provisions included capacity building in biotechnology and biosafety, assistance from the Secretariat and BCH in identifying developing country needs and securing funding, and the development and transfer of safe biotechnology to developing countries. During discussion at BSWG-2, developing countries raised other concerns as well. Zambia and South Africa mentioned the need for strengthening indigenous capacities and the development of biotechnology suitable to these populations.\textsuperscript{602} Other countries advocated capacity building to assist with informed decision-making and risk assessment, the promotion of policy and

\textsuperscript{600} \textit{Ibid}.
\textsuperscript{601} African Draft Protocol, supra note 493, Articles 12, 14.
information systems, the implementation of the protocol and the development of
technical competence to control risks.  

At BSWG-3 and BSWG-4, some developed countries noted a pre-existing
obligation to engage in capacity-building under other international frameworks and noted
a preference for relying on those mechanisms. Although these states eventually agreed
to include a capacity-building article in the protocol, this early concern about other
international mechanisms was reflected in the final text. The Protocol states that the
Parties shall cooperate in the development and strengthening of biosafety “including
through existing global, regional, subregional and national institutions and
organizations.”

Developing countries highlighted various capacity-building issues including the
need for “new and additional” financial resources, capacity to conduct risk assessment
and risk management, the need for greater information on biotech in temperate and
tropical ecosystems, technical and scientific cooperation and the possibility of an
international registry of LMOs. Some developed states advocated language about
financial and technical contributions toward capacity-building from the private sector.

Two issues separated developed and developing countries at BSWG-5. The first
was the request by developing countries for a reference to capacity-building in
biotechnology in addition to biosafety. Several developed countries opposed this

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603 Ibid.
606 Protocol, supra note 5, Article 22(1).
607 (1997) 9:74 Earth Negotiations Bulletin at 8; (1998) 9:85 Earth Negotiations Bulletin at 7; Record of
Negotiations, supra note 457 at 69.
demand. At the end of the meeting, text providing for capacity-building in “biotechnology to the extent that it relates to biosafety” remained in brackets. The second area of contention was language in the draft text facilitating private sector involvement in capacity-building. Developing countries objected to this text and it also remained in brackets.

Debate on these two subjects continued at BSWG-6 and the ExCOP. With respect to the issue of biotechnology, delegates discussed the possibility of including language stating that capacity-building in biotechnology should relate “directly” to biosafety. This suggestion was eventually rejected and Parties agreed to capacity-building in “biotechnology to the extent that it is required for biosafety.” They also agreed to retain the reference to the private sector in the text of the provision. Also included in the final provision is language regarding financial resources, transfer of technology and know-how, cooperation to enhance scientific and technical training in the safe management of biotechnology and the use of risk assessment and risk management, strengthening of human resources and development of institutional and technological capacities in biosafety.

vi. Other

The above sections highlight some of the most significant and most contentious issues that arose during the BSWG meetings and the ExCOP. One should not assume, however, that the articles of the Protocol left unmentioned were negotiated free of controversy and conflict. Article 18, which provides for certain labelling requirements to

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610 Ibid.
613 Ibid.
be met once a decision has been made to allow a transboundary transfer, was the last to be finalized at the Resumed ExCOP and caused considerable tension among the groups that were asked to resolve last minute disputes. The provisions on the BCH and public awareness also failed to be resolved until the Resumed ExCOP. The finalized BCH provision requires Parties to make available through the database, *inter alia*, existing laws and guidelines for the implementation of the *Protocol*, any bilateral or multilateral agreements entered into regarding intentional transboundary movements of LMOs, summaries of risk assessments, final decision and reports made to the COP serving as the meeting of the Parties (COP-MOP).  

This mechanism is intended to assist Parties in implementing the *Protocol*, with particular attention paid to the needs of developing countries. With respect to public participation, the Parties agreed on a provision that obliges Parties to consult the public during the decision-making process and to ensure that the public has access to the results of importing Parties’ decisions.  

This includes a requirement that Parties promote and facilitate public awareness regarding LMOs. 

Negotiation of the article on liability and redress was particularly challenging and caused a rift among developing and developed country Parties. In the end, the details of this provision were left for the COP-MOP to elaborate. Other provisions over which developing and developed countries disagreed included the article on confidential information and the article on illegal transboundary movements. The provision on risk management had to be assigned to several small groups for discussion because consensus

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614 *Protocol, supra* note 5, Article 20(3). Additional obligations are imposed on Parties throughout the *Protocol* to provide specific information to the BCH. For example, under Article 25(3) Parties are required to make available to the BCH information regarding cases of illegal transboundary movements pertaining to them.

615 *Ibid.*, Article 23(2). This is subject to the obligation on the importing state to respect confidential information in accordance with Article 21.
could not be reached. Most of the contentious issues that formed part of the draft text of this article, including financial assistance and a reference to the precautionary principle, were deleted at BSWG-6. The final provision requires Parties to institute mechanisms and strategies to control risks identified in accordance with risk assessments under the Protocol, to the extent necessary to prevent adverse effects on biodiversity.\textsuperscript{616} The risk management provision also demands that appropriate measures be undertaken that prevent unintentional transboundary movements of LMOs.\textsuperscript{617}

Finally, issues like “products thereof” and socioeconomic considerations had an impact on the negotiation of numerous provisions of the Protocol, many of which could not be finalized until those issues had been worked out. Nonetheless, by the end of the Resumed ExCOP, Parties from all five negotiating groups had agreed on the Protocol’s preamble, forty articles and three annexes.

IV. Conclusion

Negotiation of the Protocol was a formidable task. Delegates had to struggle with a broad range of opinions and demands from well over 100 states, non-governmental organizations and industry representatives. Moreover, the differences in knowledge, experience and resources of each delegate set them even further apart during the negotiation. The Parties struggled to obtain compromise on each of the provisions being discussed, while organizers worked to ensure that that each negotiating group had equal opportunity to engage in the debate and to have its voice heard. Given the challenges faced by the delegates, it is not surprising that many details were left to be resolved at a later date. The COP-MOP has the task of developing specific guidelines for the articles

\textsuperscript{616} Ibid., Articles 16(1), (2).
\textsuperscript{617} Ibid., Article 16(3).
on compliance and liability/redress. Many other articles necessitate that the Parties undertake significant work before they can be successfully implemented.

Since the Protocol was adopted, the Parties have met in various fora to address these outstanding issues. The COP-MOP has met twice, in February 2004 and June 2005, and has made progress on such issues as capacity-building, packing and identification, decision procedures and the BCH. The Parties also created a medium-term work programme that outlines issues to be addressed for the next three COP-MOP meetings.618 Work is also being conducted by smaller, more specialized groups. Liaison groups on capacity-building and the BCH have met several times and technical expert meetings, advisory committees and ad hoc working groups have been formed to assist the Parties. Moreover, regional meetings have been conducted to address specific issues in various parts of the world.

While work proceeds, the number of the Parties to the Protocol continues to increase. In accordance with Article 37, the Protocol came into force on September 11, 2003, the ninetieth day after ratification by the fiftieth state. Since then an additional 75 states have ratified the agreement, bringing the total number of Parties to 125.619 Although this is a laudable achievement, certain states are noticeably absent from the list: the six members of the Miami Group. Their failure to ratify the Protocol (and, in the case of the U.S., the Convention itself) poses a significant challenge to successful implementation of the agreement. These states comprise the world’s leading biotech producers and exporters, yet they remain outside the legal regime created to regulate trade in these products. There is some indication that they will selectively participate in

619 As of August 31, 2005.
elements of the *Protocol*’s framework: they are active members of the groups undertaking work on the *Protocol* and have posted information on the BCH website. The manner in which their failure to ratify the *Protocol* will impact the Parties and the proper functioning of the regime, however, remains to be seen.
CHAPTER IV – INFORMED DECISION-MAKING IN THE CARTAGENA PROTOCOL ON BIOSAFETY

This chapter provides a critique of the *Cartagena Protocol on Biosafety*, focusing specifically on the principle of informed consent within the agreement. Although informed decision-making should serve as the foundation of the *Protocol*, this chapter argues that this principle has been eroded both in the text of the agreement and in its implementation. As a result, the mechanisms of the agreement provide importing (primarily developing) countries with inadequate information and insufficient decision-making powers.

The chapter begins with a discussion of why informed decision-making should ground the *Protocol*, particularly in light of the circumstances of developing countries. This includes a consideration of the differing views that developed and developing countries have of informed decision-making and the way this has impacted the *Protocol*. The chapter then considers each of the elements of informed decision-making in turn. With respect to the first element, the chapter discusses constraints on the use of both scientific and non-scientific information under the *Protocol*. The chapter then considers the ways in which decision-making is circumscribed, including deference to the international trade regime, the exclusion of socioeconomic considerations, the limited scope of the agreement, ambiguous language and the position of exporting states outside the biosafety regime.

I. Informed Decision-Making for Developing Countries

A. The Right to Informed Decision-Making

The *Protocol* was an initiative of developing countries, who engaged in a long and difficult battle to develop a legally binding international biosafety regime. These
countries have consistently asserted their right to make informed decisions about biotechnology use in their territories;\textsuperscript{620} this notion has met with support and approval from developed countries and international organizations.\textsuperscript{621} Accordingly, early in the negotiating process developing countries advocated for a system of prior informed consent within the \textit{Protocol}. They received the support of most states, although the U.S. insisted that the relevant language be changed to “advance informed agreement.” With this modification, the principle of informed decision-making made its way into the \textit{Convention on Biological Diversity} article calling on states to consider the “need for and modalities” of a protocol on biosafety.

Widespread support for the inclusion of informed decision-making within the \textit{Protocol} continued in early negotiating sessions.\textsuperscript{622} The AIA procedure and information-exchange were two of the Consensus Items that emerged from the meeting of representatives from 83 states at the Open-Ended Ad Hoc Group of Experts in Biosafety established by the COP. Informed decision-making appeared in the earliest drafts of the \textit{Protocol},\textsuperscript{623} including the version presented by African countries to the third COP,\textsuperscript{624} and remained in subsequent versions through to the finalized agreement. Although initially discussed only as the AIA procedure, additional provisions relevant to informed decision-making found their way into the \textit{Protocol}’s text.

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{620} See USAID, “Questions and Answers”, \textit{supra} note 226. Developing countries reiterated this right throughout the negotiations. See e.g. (2004) 9:289 Earth Negotiations Bulletin at 7.
\item \textsuperscript{621} See e.g. FAO, \textit{State of Food and Agriculture}, \textit{supra} note 143 at 5; Ralph Hillman, “Cartagena Protocol on Biosafety: Australia’s Position” (Speech to the ABARE Outlook 2000 Conference, 2 March 2000), online: Government of Australia <http://www.dfat.gov.au/environment/bsp/hillman0300.html>; “Statement by the United States of America” (Statement made to the 1\textsuperscript{st} Meeting of the Parties to the Cartagena Protocol on Biosafety, 23 February 2004) [U.S. Statement].
\item \textsuperscript{622} Developing countries continually referred to the notion of informed decision-making throughout the negotiations. See e.g. (1997) 9:67 Earth Negotiations Bulletin at 8.
\item \textsuperscript{623} References to informed decision-making also arose in other official documents, including for example, an early elements paper on capacity-building. See (1997) 9:67 Earth Negotiations Bulletin at 8.
\item \textsuperscript{624} \textit{African Draft Protocol}, \textit{supra} note 493. See e.g. Articles 4(3), 6, 20.
\end{itemize}
\end{footnotesize}
For developing countries, calls for informed decision-making reflect the unique circumstances and challenges they face in dealing with agricultural biotechnology. Perhaps the most urgent of these challenges is their lack of experience with genetic engineering and its products. Most developing countries have a very small or non-existent agricultural biotechnology sector and have had little to no experience with biosafety issues. Accordingly, they are particularly vulnerable to the potential risks of biotech use and have insufficient capacity to mitigate damage. This is especially alarming given that these states hold the overwhelming majority of the world’s biodiversity and are the centres of diversity for most of the crops that have been engineered (e.g. rice, maize).

A much larger challenge faced by developing countries is to find a means of enabling “economic and social development and poverty eradication” which are their “first and overriding priorities.” Informed decision-making is integral to this process. Policy decisions regarding technology, trade, agriculture and food security can have significant impacts on the social and economic well-being of developing countries. As demonstrated earlier in this thesis, where the ability of developing countries to make informed and independent policy decisions in these realms is compromised, the welfare of their citizens may be threatened.

B. Biosafety and Informed Decision-Making

Despite repeated calls for informed decision-making from developing countries, and early support from countries of the North, the principle has been significantly eroded

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626 Convention, supra note 8, Preamble.
in the finalized regime. This may be attributed, in part, to countries’ different conceptions of biosafety and its relationship to informed decision-making within the Protocol.

Significantly, the term “biosafety” is not defined in the Protocol. The closest the text comes to providing a definition is in Article 1, where it is noted that “the 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 [LMOs].” Yet, it is apparent that throughout the negotiation, and even since the Protocol’s implementation, developed and developing countries have understood this vague phrase in different ways. Developing countries prefer a broad interpretation of biosafety that involves a consideration of the merits of biotechnology itself. In other words, in certain circumstances “biosafety” may only be achieved by prohibiting the import or the use of agricultural biotech products in their territories. This is reflected in the preamble to the African Draft Protocol, which acknowledges that “any State has the sovereign right to ban the entry or release of [LMOs] into its territory.” As a result, informed decision-making encompasses a detailed consideration of the short and long-term advantages and disadvantages of biotechnology use.

In contrast, developed countries view biosafety in much narrower terms. Although their opinions vary to some extent, developed countries generally accept the use of agricultural biotechnology as inevitable. For them, biosafety simply refers to the technical aspects of ensuring that the environment (and to a lesser extent, human health) is not adversely impacted by the use of biotechnology. This is also the view generally

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627 Supra, note 5.
628 African Draft Protocol, supra note 493, Preamble.
held by international organizations and other parties involved in capacity-building projects under the Protocol. Accordingly, informed decision-making for these states and organizations involves a narrow consideration of the environmental benefits and risks of biotechnology and the ways in which those risks can be mitigated.

As will be discussed in greater detail below, the final version of the Protocol incorporates a form of informed decision-making more in line with the perspective of developed countries. Moreover, even this limited version of informed decision-making is constrained in the final text of the agreement and through its implementation.

II. Information Gathering under the Protocol

Although this chapter focuses on information gathering under the regime created by the Protocol, it is important to note that barriers to the receipt of information by developing countries emerged from the start of negotiations. The reduced financial and human resources of developing countries meant that they often had only single delegates available for meetings dealing with complex issues and were sometimes unable to have even one representative at all of the scheduled meetings. In fact, at Cartagena members of the Like-Minded Group “found it difficult even to obtain information as to the location and timing of meetings, let alone to gain access to them.” In addition to these issues, developing country delegates pointed to procedural aspects of the proceedings that impeded their full participation. For example, they complained about a lack of transparency during the negotiations, the unavailability of documents in

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629 Mackenzie, supra note 50 at 39.
630 Ibid.
631 As described earlier in Chapter 3.
languages other than English\textsuperscript{633} and the absence of translation services for certain proceedings.\textsuperscript{634}

At the end of these challenging negotiations, several different provisions involving information share or information gathering had been incorporated into the \textit{Protocol}. The mechanism used for approval of LMO-FFPs (commodities) and the AIA procedure both involve the sharing of specific information regarding LMOs, including risk assessments, from exporters to potential importers. Other information share provisions include the article relating to the BCH, which obliges parties to post certain information on the BCH internet site, and the article on socioeconomic considerations. Information will also be passed from developed to developing countries as part of many programs initiated pursuant to the capacity-building provision of the \textit{Protocol}. Finally, Parties will gather and receive information relevant to decision-making as a result of implementing the public awareness and participation provision of the agreement. Despite the opportunities these articles appear to provide, the mechanisms of the \textit{Protocol} do not provide adequate information to decision-makers in developing countries.

As one commentator working in the area of global environmental assessments has argued, the manner in which information is produced and assessed may “disadvantage” the South or may result in information that is “oblivious to the interests of the South.”\textsuperscript{635} He makes reference to the role of the assessment (i.e. the information) in framing the problem at issue in certain ways, supporting specific views of the problem and selecting

\textsuperscript{633} See e.g. (1997) 9:74 Earth Negotiations Bulletin at 8.
\textsuperscript{634} See e.g. (1998) 9:81 Earth Negotiations Bulletin at 1.
\textsuperscript{635} Biermann, “Science as Power”, \textit{supra} note 133 at 3.
certain methodologies as appropriate. As in the assessment context, the processes by which information under the Protocol is developed may have adverse impacts on developing countries. The manner in which information is produced fails to account for the cultural values and assumptions implicit in scientific information, frames the problems at issue and the methodologies used to investigate them in strictly scientific terms, restricts the type of information that is being gathered and neglects the cultural, political and natural environments into which the information is being transmitted. These issues will be explored in greater detail below.

A. Scientific Information

i. Getting Science into the Protocol

Promoting Objective Science

The demand for a science-based Protocol came from both developed countries and the biotech industry. The Global Industry Coalition argued that if decisions were not based on “sound and objective science” then the “effectiveness and integrity of the Protocol” would be “severely undercut.” The primacy of science has also been asserted by international organizations, including the FAO. In its recent report on agricultural biotechnology in the developing world, the organization calls for “predictable and science-based” procedures.

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636 He also describes how the absence of adequate Southern representation on assessment panels influences the outcome of the project. This is discussed specifically in the context of the biotechnology chapter of the Global Biodiversity Assessment. *Ibid.* at 12.

637 See e.g. (1996) 9:48 Earth Negotiations Bulletin at 3 (Japan), 7 (Biotechnology Industry Organization, Japan Bioindustry Association, the Green Industry Biotechnology Platform and the Senior Advisory Group on Biotechnology); *Informal Consultations, supra* note 501 (Miami Group, EU); see also Chapter 3.


639 FAO, *State of Food and Agriculture, supra* note 143 at 5.
A significant role in creating a science-based biosafety regime was also played by the 15-member Panel created early in the negotiation process by the COP. The Panel was given the tasks of considering existing knowledge and experience with biosafety and outlining recommendations regarding the modalities of the Protocol. Reliance on a science-based decision-making procedure was advocated by the Panel because of its view that “objective parameters” should be used to gauge risk.\footnote{Panel of Experts Report, supra note 435 at para. 24.} Although the Panel recognized that socioeconomic considerations may impact decisions regarding LMOs, it concluded that these concerns should not form part of risk assessment because they incorporate value judgments that vary from country to country.\footnote{Ibid.} Accordingly, the Panel defined risk assessment as a process based on the “use of scientific data” to identify hazards.\footnote{Panel of Experts Report, supra note 435 at para. 38.} These recommendations of the Panel were adopted at the Meeting of the Open-Ended Ad Hoc Group of Experts on Biosafety. The group accepted that the Protocol should take into account scientific considerations and should apply a technical/scientific methodology to risk assessment.

Accordingly, biosafety under the Protocol became a process driven by “objective” scientific considerations. This is reflected throughout the text of the final agreement. The Protocol focuses on the environmental and health effects of LMOs,\footnote{The Preamble recognizes that “modern biotechnology has great potential for human well-being if developed and used with adequate safety measures for the environment and human health.” Protocol, supra note 5.} impacts that are the subject of scientific study and that fall within the domain of experts.\footnote{For example, Article 2(5) of the Protocol encourages the Parties to take into account “available expertise” and “work undertaken in international forums with competence in the area of risks to human health.” Paragraph 3 of Annex III also refers to “expert advice” in regard to the general principles of risk assessment. Ibid.}
making is premised on risk assessments “carried out in a scientifically sound manner” and generated with the use of “scientific evidence.” These decisions may be reviewed where additional “scientific or technical information” becomes available. Moreover, the “exchange of scientific, technical, environmental and legal information” regarding LMOs is to be facilitated through use of the BCH and capacity-building is to be used to assist with “scientific and technical training” and “the enhancement of technological... capacities in biosafety.”

Questioning Objectivity

Despite attempts by drafters of the Protocol to portray risk assessment as an objective exercise, considerable research has demonstrated that science itself is a value-laden process. The assessment of risk is impacted by a multitude of factors including previous regulatory experiences, culture, historical circumstance, the political environment, economic interests and social context. Risk assessment is “far from a one-size-fits-all scientific endeavor” because “different social systems....tolerate different structures and sources of risk.” For example, risk assessments in industrialized countries are often based on the potential impacts of agricultural biotechnology as compared to “an implicit standard of ‘acceptable risk’” that is measured by the existing “industrial-scale, chemical-based agriculture.” Accordingly, biotechnology is viewed

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645 Ibid., Article 15(1).
646 Ibid., Article 12(2)(b).
647 Ibid., Article 22(2).
648 Zakri, supra note 625 at 1; Clark Miller, “Extending Assessment Communities to Developing Countries” (1998) at 12, 26, online: Global Environmental Assessment Project <http://www.ksg.harvard.edu/gea/pubs.htm>; Winickoff et al., supra note 136 at 106.
649 Philipp Aerni, “Public Attitudes towards Agricultural Biotechnology in Developing Countries: A Comparison between Mexico and the Philippines” (STI Research Report, 2001) at 8.
650 Winickoff et al., supra note 136 at 93.
651 Ibid. at 97.
652 Zakri, supra note 625 at 2.
as hazardous only insofar as it has a greater adverse impact than existing agricultural methods.\(^{653}\)

It cannot be presumed that scientific knowledge can simply be shifted from one culture or country to another with no ill-effect. The values and presumptions that infuse science “can lead to ineffectual (or even damaging) policies or social conflict when knowledge is transferred from one context to another.”\(^{654}\) As one commentator observes:

> It is impossible to tell a person what risks they should be concerned about, unless one knows something about the value they put on those risks, as well as the potential benefits, including the extent of both beneficial and adverse outcomes, their likelihood of occurring, and their distribution among the population.\(^{655}\)

The manner in which specific cultural, political and socioeconomic environments impact science and risk assessment is evidenced by examining the transatlantic GM debate.\(^{656}\) In the United States, the regulatory system for GMOs is premised upon an examination of the “objective characteristics” of the substance, “irrespective of the method by which it is developed.”\(^{657}\) This risk assessment strategy is referred to as substantial equivalence; crops that are substantially equivalent to their non-GM relatives

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\(^{653}\) Ibid.

\(^{654}\) Miller, supra note 648 at 26.


\(^{656}\) Gupta, “Advance Informed Agreement”, supra note 638 at 272-273. The manner in which similar scientific information can result in different evaluations of risk, even among scientists from similar cultures, is evidenced by discussion surrounding recent litigation about a new Monsanto GM corn product in Germany. The corn has been approved in Canada, Australia, Japan and the U.S. Yet a scientist from the relevant French government agency and another who conducted a risk assessment for Germany both stated that research on the new GM corn variety revealed significant adverse health impacts. The German scientist concluded that the variety should not be licensed. The EU had not yet offered its approval. “Genetically modified corn concerns” The Globe and Mail (22 June 2005), online: The Globe and Mail <http://www.theglobeandmail.com>.

do not attract additional regulation.\textsuperscript{658} The impact of this method of regulation is to minimize the novelty of GM technologies.\textsuperscript{659} In contrast to the \textit{product} focus of the U.S. system, EU regulations focus on the \textit{process} by which a substance is created. Since LMOs are generated using a novel process, they are subject to specific regulations; these LMOs may pose unique risks to the environment or to human health “even if the product is ostensibly ‘equivalent’ to a non-GM product.”\textsuperscript{660} This regime requires a risk assessment and prior consent for each LMO intended for release;\textsuperscript{661} in addition, it requires the labelling of all LMOs and products thereof, regardless of whether the product contains DNA fragments.\textsuperscript{662} As will be discussed further below, this debate between the EU and the U.S. has been so contentious that it has resulted in the initiation of proceedings by the U.S. (along with Canada and Argentina) at the WTO. As one set of commentators point out, the presumption by many that there exists a “level of consensus on the meaning of sound science...is contradicted” by the very existence of these proceedings.\textsuperscript{663}

It is important to note that the two protagonists in this transatlantic dispute are, relatively speaking, fairly similar in culture, political orientation, level of development and socioeconomic structure. The differences that might exist in evaluations of risk and

\begin{itemize}
\item \textsuperscript{658} Newell & Glover, \textit{supra} note 52 at 7.
\item \textsuperscript{659} Applegate, \textit{supra} note 657 at 233. As a consequence, the U.S. “has neither engaged in any post-harvest testing of GM crops nor conducted any systematic testing of the ingestion of foods produced through genetic modification.” Winickoff \textit{et al.}, \textit{supra} note 136 at 102.
\item \textsuperscript{660} \textit{European Communities – Measures Affecting the Approval and Marketing of Biotech Products “Amicus Curiae Brief Submitted to the Dispute Settlement Panel of the WTO in the Case of EC: Measures Affecting the Approval and Marketing of Biotech Products” (30 April 2004) WT/DS291, 292 and 293 at 9 [Amicus Brief].}
\item \textsuperscript{661} Newell & Glover, \textit{supra} note 52 at 7.
\item \textsuperscript{663} Winickoff \textit{et al.}, \textit{ibid.} at 84.
\end{itemize}
regulatory choices made by European or North American countries and those of the South could be even more divergent.

These observations about the nature of science and risk assessments raise some concerns about the conclusions made by the Panel in the early stages of the Protocol’s negotiation. The Panel indicated that the “assessment and management of risks” arising from the use of LMOs is not significantly different “from that used in other technologies” and that risk assessment methods that are already in place are sufficient for the evaluation of LMOs.664 This was a significant conclusion; it gave credence to the idea of risk assessment as the foundation of biosafety within the Protocol and it downplayed any concern that genetic engineering posed unique risks. Yet, this conclusion was made on the basis of a limited set of information: the Panel considered “existing methods for and practices of risk assessment and management” with respect to LMOs.665 This existing knowledge and experience would have come almost exclusively from developed countries, with different capacities, concerns, environments, cultures and socioeconomic conditions than those of the developing world. Although the Panel recognized that risk assessment methods would have to take into account a greater range of environmental conditions in order to be useful in a greater number of states, the belief that scientific evaluation of LMOs is an objective, technical exercise precluded a consideration of other conditions that would vary between these two groups of states.666

664 Panel of Experts Report, supra note 435 at para. 64.
665 Ibid. at para. 83.
666 In addition to these problems regarding the information available to the Panel from external sources, the knowledge and experience of the Panel members themselves also posed problems. Although developing countries were represented on the Panel, they held a disproportionate number of seats given the percentage of the global population that they represent. Moreover, given that the determination of scientific principles involves political negotiation, the minimal capacities, experiences and resources of developing country representatives would have limited their influence in this exercise.
ii. Science and Risk Assessment in the Protocol

"Risks" and the Exporting State

Given these early negotiation dynamics, it is not surprising that concepts like "sound science" and "recognized risk assessment techniques" made their way into the final text of the Protocol. Yet, these concepts are misleading. As discussed above, science and risk assessment will always incorporate certain presumptions and values that are culture-specific. Thus the mention of "sound science" begs the question of "Whose sound science?"667

Moreover, as is apparent from the above descriptions of the different mechanisms utilized in the U.S. and the EU, no universal standards or methods for risk assessment have been established.668 Even a cursory comparison between the risk assessment procedures outlined in the finalized Protocol and those that were included in the original African Draft Protocol reveals a marked divergence in the content of information contemplated in each procedure.669

One significant consequence that arises from these observations stems from the fact that information within the biosafety regime will be transferred primarily from a small number of developed countries to a large number of developing countries. Under the Protocol, although the Party of import is responsible for ensuring that a risk assessment is undertaken, it may request that the exporter conduct the assessment. Given the minimal

667 Gupta, Global Governance, supra note 61 at 55.
668 Zakri, supra note 625 at 1; Amicus Brief, supra note 660 at 6; Report of the Sub-Regional Workshops for Anglophone Africa on: Risk Assessment and Management and Public Awareness and Participation (UNEP-GEF Project on Development of National Biosafety Workshops, November 2002) at 15, online: UNEP <http://www.unep.ch/biosafety/devdocuments.htm> [Anglophone Workshops]. It should be pointed out that the Panel indicated that “methodologies for risk assessment are well defined and therefore can be, and are, applied to the use and release of LMOs.” No further information is given regarding these “well defined” risk assessment procedures. Panel of Experts Report, supra note 435 at para. 64.
capacity of many developing countries to undertake assessments of this nature, it is likely that many will take advantage of this option. While this information is being portrayed as “objective” scientific and technical information it is, in fact, a product of the cultural, political and socioeconomic environment from which it originates. This environment and the values, assumptions and concerns that it supports, differ significantly from that which exists in the developing countries that are recipients of the information. In addition to this problem, the science-based Protocol fails to take into account the cultural, political and socioeconomic environments of importing (developing) states. This will be examined in greater detail below.

Public Participation and Risk

Given the value-laden nature of scientific information, risk assessment is viewed as incomplete and “scientifically and politically unreliable”\(^\text{670}\) if it doesn’t integrate society’s perceptions and views on risk. For this reason, public participation is considered an integral component of risk assessment,\(^\text{671}\) particularly in “new and contested risk situations” like that of agricultural biotechnology.\(^\text{672}\)

Yet, despite the importance of public participation in risk assessment, the Protocol does not provide for such a mechanism. Under the agreement, public participation plays a role in decision-making but not risk assessment; the public’s role in the mechanisms of the Protocol does not come into play until after a risk assessment is complete.\(^\text{673}\) This results from the fact that the Protocol is grounded in “sound science.” On this basis, “the

\(^{670}\) Winickoff et al., supra note 136 at 99.  
\(^{671}\) Ibid.; GM Science Review Panel, supra note 313 at 12.  
\(^{672}\) Winickoff et al., supra note 136 at 85.  
\(^{673}\) Moreover, this role is limited by the wording of Article 23. Public participation is limited to issues regarding “conservation and sustainable use of biological diversity, taking also into account risks to human health.” Thus, “the terms of the Protocol imply that there should be quite narrow limits on the scope for public participation to consider the socio-economic, ethical or religious implications of GMOs.” Dominic Glover, supra note 655 at 6-7.
specialised process of risk assessment” must take place before the public is consulted. Without relevant public input, risk assessments may contain a distorted or incomplete view of the cultural, political or socioeconomic perspectives that influence perceptions of risk. As noted by one set of commentators:

Scientific risk assessment necessarily involves the prior selection of the objects of analytic attention, reflecting what is collectively valued and thus worthy of possible protection. There is no guarantee that such technical practices of relative weighting reflect wider societal values and priorities, or even defensible approximations of those values, without adequate public consultation.

“Acceptable” risks

There are other ways in which a reliance on sound science within the Protocol precludes a consideration of the cultural, political and socioeconomic environments of importing (developing) countries. Under the Protocol, a risk assessment must be conducted before a decision on import can be made for an LMO intended to be introduced into the environment. In addition to the requirements in Article 15 that the risk assessment be “carried out in a scientifically sound manner” and that it be based on “scientific evidence,” Annex III of the Protocol lists the objective, general principles and methodology that are to be followed (or considered) in conducting the assessment. In the Annex, the Protocol again emphasizes that risk assessments are to be “scientifically sound” and a list of the “technical and scientific details” regarding the LMO that are to be taken into account is provided. Yet, despite this emphasis on the need for science to govern the risk assessment, many of the elements listed under the “Methodology” section of Annex III could not be thoroughly undertaken without a consideration of “non-scientific” information. For example, the risk assessment requires the identification of

674 Ibid. at 13.
675 Winickoff et al., supra note 136 at 99.
676 Protocol, supra note 5, Annex III at paras. 3, 9.
any potential adverse effects that the LMO may have on biological diversity in the receiving environment but also a “recommendation as to whether or not the risks are acceptable or manageable, including, where necessary, identification of strategies to manage these risks.”

A determination of whether the risks are “acceptable” or “manageable” necessarily involves a consideration of the political, cultural and socioeconomic environment into which the LMO is being transferred. Not only does this appear to be precluded given the emphasis on science-based risk assessments, but it is also unlikely that the risk assessor would have access to this type of information. Exporters certainly lack the experience to make what amounts to a political decision regarding the acceptability or manageability of LMO risks. In fact, it is questionable how well risk assessors in exporting countries would be able to evaluate even the “scientific” aspects of risk in developing countries, given the lack of experience with LMOs in those regions, their dramatically different climates and the different quantity and quality of genetic diversity present in the developing world. These factors impact the quality of the risk assessment that is undertaken and that is passed on to the relevant importing (developing) country as the basis upon which import decisions are made.

\[677\] Ibid., Annex III at para. 8(e).
\[678\] The fact that a decision setting out an acceptable level of risk is a political one was noted by several countries during the negotiation. See (2000) 9:137 Earth Negotiations Bulletin at 10.
\[679\] The “significant gaps in knowledge” that exist with respect to the “interaction between LMOs...and the environment” was recognized by the Open-Ended Ad Hoc Group of Experts on Biosafety. The group noted that these gaps exist because of the “relatively short period of experience with releases of such organisms, the relatively small number of species and traits used, and the lack of experience in a range of environments, specifically those in centres of origin and genetic diversity.” Report of Experts on Biosafety, supra note 444 at para. 11.
The Extent of Risks

An exclusive reliance on scientific considerations also affects the risk assessment procedure for LMOs intended for food, feed and for processing (LMO-FFPs). As described in an earlier chapter, the AIA procedure under the Protocol does not apply to LMO-FFPs. Instead, the exporting state is required to notify the BCH when a regulatory decision about the LMO has been made in its territory that might result in export of the LMO. The information the exporting state must provide to the BCH includes a risk assessment but since there is no importing state identified at the time the information is provided, the risk assessment is not specific to any particular importing country’s environment. Rather, it is intended that the risk assessment provided is the one that was completed by the exporting state’s regulatory authorities when domestic use of the LMO was being considered.

For the developed countries that advocated this alternate procedure, a risk assessment that takes into account the potential receiving environment is unnecessary given that LMO-FFPs are not intended for introduction into the environment. In other words, sound science dictates that these LMOs pose less of a risk and require less rigorous biosafety procedures. Yet, this conclusion ignores the socioeconomic and cultural realities of the developing countries likely to import LMO-FFPs. Many LMO-FFPs can function as seeds, and during the negotiations developing countries repeatedly warned exporting states that farmers within their countries may plant (rather than eat)

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680 It is worth noting that, under the procedure for LMO-FFPs, fewer pieces of information must be given to the BCH when giving notification of a domestic decision (as compared to information provided to an importing party under the AIA procedure). Governing Biotechnology in Africa: Toward Consensus on Key Issues in Biosafety (Draft) (Second Session of the African Policy Dialogues on Biotechnology, September 2004) at 26 [Governing Biotechnology in Africa].
these LMO commodities. The warnings of developing countries were not simply conjecture. In Mexico, the government has indicated that the planting of LMOs intended for consumption has resulted in contamination of traditional maize varieties in two regions of the country.

Since scientific reasoning prevails in the Protocol, the less rigorous procedure for LMO-FFPs was adopted. As a result, developing countries wishing to import LMO-FFPs do not have access to a risk assessment that outlines the risks posed to their environment by the LMO-FFP in question. Rather, these countries only have available to them a risk assessment detailing the risks posed by the LMO-FFP in the exporting state. These assessments would be premised on the environment, scientific and technical capacity and concerns of another (usually developed) country.

**Risk Management**

The inadequacy of information in risk assessments is particularly problematic for developing countries given that the Protocol makes importing states responsible for risk management within their territories. This was something that was advocated by developed countries. The relevant provisions of the agreement state that:

16(1) The Parties shall...establish and maintain appropriate mechanisms, measures and strategies to regulate, manage and control risks identified in the risk assessment provisions of this Protocol associated with the use, handling and transboundary movement of [LMOs].

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682 ETC Group, “Genetic Pollution in Mexico’s Center of Maize Diversity” (2002) 8:2 Backgrounder, online: <http://www.etcgroup.org>. An article in the influential journal *Nature* also reported the contamination. See D. Quist and I. Chapela, “Transgenic DNA Introgressed into Traditional Maize Landraces in Oaxaca, Mexico” (2001) 414:6863 Nature 541. After a campaign launched by biotech advocates in an attempt to discredit the report, Nature “took the highly unusual step of disavowing the Chapela and Quist article.” Soon thereafter, however, the Mexican government again confirmed that contamination existed in its native plants. (ETC Group, *ibid.*)
(2) Measures based on risk assessment shall be imposed to the extent necessary to prevent adverse effects of the [LMO] on the conservation and sustainable use of biological diversity, taking also into account risks to human health, within the territory of the Party of import. 683

With inadequate information, developing countries' ability to properly manage risks is diminished. The obstacles they face in this regard are compounded by their limited experience with LMOs and their insufficient biosafety capacity. Given this predicament, it is disappointing that risk management mechanisms have been identified as one of the areas in which capacity-building projects have proven deficient. 684 This may be linked to the fact that industry groups have promoted capacity-building projects focusing on issues relating to transboundary movements since that is the "primary business of the Protocol and the core of the obligations countries have undertaken." 685

This perspective ignores the onerous domestic obligations imposed under Article 16 and the challenges faced by developing countries in meeting those obligations.

iii. Capacity Building

"Objective" Capacity Building

Scientific information is also passed to developing countries through the capacity building mechanism. Article 22 of the Protocol states that Parties "shall cooperate in the development and/or strengthening of human resources and institutional capacities in biosafety"; in particular, the article mentions "scientific and technical training in the proper and safe management of biotechnology," the "use of risk assessment and risk

683 Protocol, supra note 5.
management” and “the enhancement of technological and institutional capacities in biosafety.” As with other forms of information share under the Protocol, the information provided under the capacity-building provision will be passed (primarily) from developed to developing countries. The capacity-building provision is unique, however, in that it also engages international organizations and specifically facilitates “private sector involvement.”

The involvement of developed countries, international organizations and industry in passing scientific information to developing countries is problematic for the reasons outlined in the previous section of this chapter. Although presented as objective, scientific and technical, such information incorporates presumptions and values about risk that may not match those of the recipient states.

In the case of capacity-building, however, it is not just the difference in cultural, political or socioeconomic perceptions of risk between the giver and the receiver of information that poses the problem. The purpose of capacity-building is to build the foundation for future biosafety institutions and mechanisms within the developing country. In other words, the impact of the information provided under this mechanism is much greater than simply influencing a decision on the import of a particular LMO. The information passed under capacity-building programs will have an important role in the development of biosafety (and possibly biotechnology) throughout much of the developing world. As a result, the fact that many capacity-builders have specific views

686 Protocol, supra note 5, Articles 22(1), 22(2).
687 As mentioned earlier, developing countries did not want this phrase regarding the private sector included in the capacity-building provision.
688 For example, the FAO indicates that it provides “objective, science-based information on agricultural biotechnology” to ensure that “member countries and their citizens” have access to “balanced and unbiased information on the potential benefits and risks of biotechnology.” FAO, State of Food and Agriculture, supra note 143 at 101.
on the merits of biotech and the manner in which it should be regulated that are not always consistent with those of the South raises the concern that independent, informed decision-making by the developing world may be inhibited.

As outlined earlier, biotech advocates have strong views about the merits of agricultural biotechnology for developing countries. This includes not only individual countries, like the U.S., but also international groups and organizations involved in capacity-building like the World Bank, UNIDO and the FAO. These advocates believe that the benefits of biotech far outweigh the risks. For them, the need for developing countries to adopt agricultural biotechnology is not a debatable point – it is an assumed fact. The U.S. Under-Secretary for Economic, Business and Agricultural Affairs has

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689 Commentators have raised some concerns about the influence of institutions (with pro-biotech perspectives) on domestic regulations and potential conflicts of interest with respect to implementation of the Protocol; however, none of the concerns raised deal with the role played by biotech exporters and the biotech industry in capacity-building. For example, one writer raises the issue of the potential impact of international information institutions (like the Global Biodiversity Assessment mechanism, which contains a very optimistic view of the role of agricultural biotechnology in developing countries) on funding organizations like the GEF, UNDP, World Bank or UNEP. He notes that “[t]o the extent that domestic decisions are taken with a view to the availability of foreign funding, some impacts of international information institutions on shaping the domestic debate can thus be assumed.” Frank Biermann, “Big Science, Small Impacts – in the South? The Influence of International Environmental Information Institutions on Policy-Making in India” (1999) at 15-16, online: Global Environmental Assessment Project <http://www.ksg.harvard.edu/gea/pubs.htm>. A representative of UNEP has raised the issue of the potential conflict of experts asked to assist governments with decision-making if their research is being funded by the biotech industry. Anglophone Workshops, supra note 668 at 21. Moreover, developing countries have expressed concern about the role of exporting states (particularly the U.S.) in funding international organizations like the FAO. Just after the negotiations, these countries noted that the funding role played by the U.S. “reduces the likelihood that international instruments will address concerns regarding socio-economic impacts that the trade in GMOs may have on their countries.” Peter Newell, “Globalisation and the International Governance of Modern Biotechnology Mapping Paper” (undated) at 13, online: Globalization and Poverty <http://www.gapresearch.org/governance/biotech.html> (referencing an interview with the leading spokesperson for G77 + China group, ICCP2, Nairobi, 2001).


691 See Chapter 2.

692 Not surprisingly, the view of industry is similar with respect to the need for developing countries to adopt agricultural biotechnology. In the description of the role of industry in capacity building, the Global
noted that “US foreign policy is...devoted to a longer-term struggle to gain world acceptance of agricultural biotechnology products.” This outlook is not conducive to creating an enabling environment in which developing countries can make their own independent and informed decisions about the merits of biotechnology.

The views of the U.S., industry and international organizations on the merits of agricultural biotechnology impact their approach to the interpretation and implementation of the Protocol. For example, the pro-biotech views of capacity-builders influence their perspective on the “scientific” elements of the agreement. Early in the negotiations the Biotechnology Industry Organization, along with several other industry associations, advocated a regulatory regime that focuses on product over process (and therefore minimizes the novelty of LMOs) and that was premised on the standard of substantial equivalence. This concept as a means of “scientific” risk assessment has also received the blessing of the FAO, the World Health Organization (WHO) and the OECD. Moreover, even the precautionary principle does not always receive support from those engaged in capacity-building. At a subcommittee meeting in the U.S. House of

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693 Agriculture and Biotechnology in US Foreign Policy, Statement by Alan P. Larson, Under Secretary for Economic, Business and Agricultural Affairs, to the Commodity Club of Washington DC, 10 April 2002, available at http://www.state.gov cited in Mackenzie, supra note 50 at 37. The address to the Commodity Club by the Under Secretary dealt with issues related to capacity-building in developing countries. He mentioned the potential of biotech products to promote sustainable development and food security and noted that there “are encouraging signs that developing countries...understand the role that agricultural biotechnology can play in their poverty alleviation and overall economic growth strategies.” Moreover, he discussed U.S. biotech “outreach” programs and U.S. intervention in the regulation of biotech in certain countries (he mentions China specifically, an issue that is discussed in greater detail in Chapter 4 of this thesis). (Ibid.)

694 This was at BSWG-1. See (1996) 9:48 Earth Negotiations Bulletin at 7 (Biotechnology Industry Organization, the Japan Bioindustry Association, the Green Industry Biotechnology Platform and the Senior Advisory Group on Biotechnology).


696 Newell, supra note 689 at 7.
Representatives, the Monsanto’s Vice President for Product and Technology Cooperation of Monsanto stated that:

[T]he so-called precautionary principle...fails to recognize the greater risks and harm that will certainly be caused by moving more slowly than is warranted by careful analysis of risks and needs. The opportunity cost for developing countries to forgo much needed benefits for the principle of precaution at any price is too great a price to pay – and certainly not necessary to ensure safety.  

Another concern regarding the perspective of capacity-builders stems from the discussion above regarding the subjective elements of scientific information being transferred to developing countries. One way in which the value-laden nature of scientific knowledge can be managed so as to avoid adverse effects in the recipient country is to “pay attention to the existence of critical communities who can evaluate the tacit values and biases embedded in assessment processes against the realities of local conditions.” In other words, there is a need for “scientific skepticism” in recipient (developing) countries. As one commentator notes: “When knowledge claims move from one context to another, they are...often subjected to the least critical review – especially in developing countries. The results can be disastrous.” Generally, the means of ensuring skepticism or critique of this sort are not transferred along with scientific knowledge; capacity needs to be developed in this regard. Given the

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697 U.S., Subcommittee on Research, supra note 298 at 143 (Dr. Robert B. Horsch). This hearing focused on the topic of “Plant Biotechnology Research and Development in Africa: Challenges and Opportunities.” The overview provided at the beginning of the hearing (which provides a framework for the discussions to follow) mentions many of the capacity-building programs (referred to as “outreach” programs) sponsored by U.S. agencies including those of USAID, the NSF and the USDA. The hearing also dealt with such issues as biosafety, trade concerns and regulatory barriers that have “precluded Africa from benefiting from biotech.” (Ibid.)

698 Miller, supra note 648 at 28.

699 Ibid. at 34.

700 Ibid. at 35.

701 Ibid.
perspective of most capacity-builders, it is far from clear that the knowledge and skills necessary for the development of “scientific skepticism” will be a priority.

The view of capacity-builders on the merits of agricultural biotechnology also precludes them from engaging in a broader inquiry about the impacts of this technology.\(^\text{702}\) For example, the FAO\(^\text{703}\) has noted that developing countries should have “the knowledge and skills necessary to make their own decisions about the use of biotechnology.”\(^\text{704}\) Yet, in the same report it advocates a system of “science-based” regulation.\(^\text{705}\) In this vein, the FAO\(^\text{706}\) discusses its role in assisting member countries by providing “science-based guidance and standard-setting.”\(^\text{707}\) Given the importance of socioeconomic considerations to developing countries, which is discussed in greater detail below, the two propositions of the FAO appear incompatible. The only way to

\[^{702}\text{Their perspective on the merits of agricultural biotechnology also influences their view on the relationship between the Protocol and the SPS Agreement. For example, both Australia and the U.S. have stated that the Protocol should be implemented in a manner that ensures consistency with the WTO Agreements. Hillman, supra note 621; U.S. Statement, supra note 621. Industry representatives and members of the Miami Group have argued that the precautionary principle in the Protocol doesn’t go further than what is permitted under the SPS Agreement. Gupta, “Advance Informed Agreement”, supra note 638 at 276 (referencing an interview with Miami Group Delegates, in Montreal, January 2000).}\]

\[^{703}\text{The FAO notes in its report that it plays a role in capacity-building in its member states. This includes assisting in the development of “legal and regulatory frameworks in harmony with international obligations”. The organization is also involved in information dissemination. FAO, State of Food and Agriculture, supra note 143 at 101.}\]

\[^{704}\text{Ibid. at 5.}\]

\[^{705}\text{ Ibid. The focus on science-based regulation is repeated in various statements by other capacity-builders. See e.g. U.S. Statement, supra note 621.}\]

\[^{706}\text{Other capacity-builders also ignore developing country concern with the socioeconomic impacts of biotechnology. In a document outlining its support for capacity-building, the GEF identified one of the “key social issues” of agricultural biotechnology as the “concerns of...the private sector...on trade and economic related issues.” The document notes that farmers and the general public are also concerned about “trade and economic related issues.” GEF Support for Capacity-Building, UNEP/CBD/BS/COP/MOP/I/INF/19 (2004) at 14, online: Convention on Biological Diversity <http://www.biodiv.org/doc/meeting.aspx?mtg=MOP-01&tab=1>.}\]

\[^{707}\text{FAO, State of Food and Agriculture, supra note 143 at 101. In its “Statement on Biotechnology”, the FAO notes that it is “aware of the concern about the potential risks posed by certain aspects of biotechnology.” It states that these risks “fall into two basic categories: the effects on human and animal health and the environmental consequences.” FAO, “FAO Statement on Biotechnology”, online: FAO <http://www.fao.org/biotech/stat.asp>.}\]
reconcile them is to assume that it is the FAO, not the developing country itself, which
should deem what “knowledge and skills” are “necessary” for decision-making.

These issues regarding the views of capacity-builders are particularly important
given that these companies and states have a considerable amount to gain from the spread
of agricultural biotechnology to the South. As summarized by one group of Earth
Negotiations Bulletin staff writers at the end of BSWG-5, “[s]ome developing country
delegates believed the interest in trade and the desire to attain unfettered access to the
markets of developing economies may provide the only incentive for the developed
countries to negotiate this protocol.” As a result, “a number of delegates” referred to
the draft Protocol’s text as a “biotrade” agreement that “would facilitate the trade of
LMOs” rather than the protection of biodiversity. Similarly, one commentator notes
that the Protocol “reads in places rather more like an investment agreement for
biotechnology, confirming the entry and exit options of MNCs, than an environmental
accord.”

The fact that many developed states, companies and international organizations
have particular views on the merits of agricultural biotechnology and an interest in its
spread to the developing world raises concerns about their influence in the design and
implementation of capacity-building programs. These concerns are heightened given the
inadequate representation of developing countries on many bodies responsible for
designing and managing capacity-building. For example, the National Biosafety

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708 As pointed out by one representative speaking on behalf of a number of NGOs, caution should be
exercised not to put “the foxes in charge of the hen house.” Report of the Open-Ended Expert Meeting on
Capacity-Building for the Cartagena Protocol on Biosafety, UNEP/CBD/BS/EM-CB/1/3 (2001) at 10,
710 This comment was made at the end of BSWG-6 when the Protocol’s text was close to its final form.
711 Newell & Glover, supra note 52 at 16.
Framework project, which is the largest of the UNEP-GEF capacity-building projects, is directed by a “technical Steering Committee” established by UNEP and the GEF Secretariat. The committee is comprised of representatives from international organizations involved in capacity-building (the GEF, UNEP, UNIDO, FAO, the World Bank, etc.) and the ICCP Secretariat, but has no place for a representative with a developing country perspective.\footnote{UNEP/GEF Building Capacity for the Implementation of the Cartagena Protocol on Biosafety (2002) at 20, online: UNEP <http://www.unep.ch/biosafety/> [UNEP/GEF Building Capacity].} Coordination Meetings, which assist with implementation of an action plan drawn up by the Parties to facilitate capacity-building,\footnote{Action Plan for Building Capacities for the Effective Implementation of the Cartagena Protocol on Biosafety, Annex I, COP-MOP Dec. BS-1/5 (2004), online: Convention on Biological Diversity <http://www.biodiv.org/doc/meeting.aspx?mtg=MOP-01>.} are attended by more than 30 participants. Of these participants, six represent the developing world. The remaining members represent international organizations involved in capacity-building, industry and developed countries; eight members are from Europe alone.\footnote{Report of the Coordination Meeting for Governments and Organizations Implementing or Funding Biosafety Capacity-Building Activities, UNEP/CBD/BS/CM-CB/1/5 (2005), Annex 3, online: Convention on Biological Diversity <http://www.biodiv.org/doc/meeting.aspx?mtg=BSCMCB-01> One of the main issues on the agenda of the meeting was consideration of the draft report on the biosafety capacity-building needs and priorities of countries – a topic for which developing country input seems particularly relevant. (Ibid. at 2.)} As noted by two commentators in a joint paper, “[a]lthough some coordination and cooperation occurs, present approaches suggest that capacity-building initiatives flow from the mandates of particular international organisations.”\footnote{Mackenzie & Newell, supra note 48 at 21.}

The Long Road Ahead

In addition to concerns about the “objectivity” of information being passed to developing countries through capacity-building programs, another problem is the vast amount of work that must be undertaken to build the capacities of these states. Generally, developing country experience with biosafety and biotechnology issues is minimal at
best. Developing countries’ lack of resources even impacts their ability to take part in capacity-building workshops intended to assist them. Developing countries also lack essential capacity and infrastructure for enabling public access to information and participation in decision-making. They mention that a primary obstacle to ensuring public participation and awareness is a high illiteracy rate among their populations. Additional problems arise because the great majority of farmers in the developing world are based in rural areas. Furthermore women, who produce between 60 and 80% of food in the majority of developing countries, face unique obstacles to acquiring information. For these reasons, it is not surprising that in many developing countries, knowledge of GM issues is minimal. This problem is heightened for those segments of the population that do not speak English. Accordingly, a considerable amount of work is needed to generate levels of “legal literacy” such that individuals have an understanding of biosafety-related issues including awareness of benefits and risks, potential types of regulation and decision-making procedures.

716 Governing Biotechnology in Africa, supra note 680 at 12-13, 37-38; GEF Support for Capacity-Building, supra note 706 at 15.
717 Anglophone Workshops, supra note 668, Annex III.
718 Ibid. at 31; Glover, supra note 655 at 20.
Even where basic impediments like illiteracy or isolation in rural areas are not the problem, another impediment to public access to information and informed participation exists.\(^7^{23}\) The BCH, which is the most complete source of publicly available information about the mechanisms of the Protocol, is housed on the internet. This tool is unavailable to the great majority of the developing world population. In 2002, 10 out of every 1,000 people in low income countries were users of the internet; if extended to include middle income countries, the figure only increases to 50 out of every 1,000.\(^7^{24}\) This is particularly problematic as the public is a valuable source of information to countries making decisions about the import of LMOs. Without adequate infrastructure in this regard, governments have insufficient access to this important source of information.

The enormous amount of work that is needed to build capacities in developing countries is even more overwhelming given the relatively limited budget dedicated to these programs. Currently, the largest capacity-building program is conducted and funded by UNEP-GEF. Its total budget is $38.4 million.\(^7^{25}\) This provides the National Biosafety Framework project, a component of the UNEP-GEF program that assists countries with the development of frameworks for implementation of the Protocol, with a budget of only $400,000 per country.\(^7^{26}\) Concern has been expressed that the limited budget of this program has resulted in a “harmonized” approach to capacity-building.

\(^7^{23}\) Glover also notes that the success of public participation will also depend on whether the relevant country has a “culture or tradition of public participation, linked to democratic, transparent and accountable government.” Glover, supra note 655 at 20.

\(^7^{24}\) The comparable figure for high income countries is 364 out of every 1,000 people. World Bank, Development Indicators, supra note 147 at 296.


projects, such that “standardised ‘toolkits’” are being used in place of the development of programs specifically tailored to local environments.\(^{727}\)

Recognizing that capacity-building is a longer-term process and that decisions would have to made about LMOs in the short term, developing countries (and NGOs)\(^{728}\) repeatedly requested that a moratorium on the trade of LMOs be imposed.\(^{729}\) As one commentator notes, “there appears to be a significant mismatch between timeframes for capacity-building for implementation and enforcement of risk assessment and risk management mechanisms, and those for the entry of GMOs into the marketplace and into the field.”\(^{730}\) Despite their insistence, and the obvious logic behind a moratorium given developing country vulnerability to the risks of LMOs, developed countries would not support it. Instead, a roster of experts was created, in part, to provide developing countries with the assistance and information they would need to make decisions about the import of LMOs while capacity-building programs were put into place.\(^{731}\) Although this is a slight improvement over the alternative of having developing countries fend for themselves, it is hardly a suitable substitute for local capacity.\(^{732}\)

\(^{727}\) Glover, supra note 655 at 12.

\(^{728}\) Switzerland also suggested that capacity building should precede implementation of the Protocol. (1996) 9:48 Earth Negotiations Bulletin at 5.


\(^{730}\) Mackenzie & Newell, supra note 48 at 15.


\(^{732}\) It is worth noting that WWF International has called for the COP-MOP to make information regarding each person on the roster (including their experience, past and present affiliations and funding) publicly available and to include individuals from civil society on the roster. Compilation of Submissions on Capacity-Building, supra note 685 at 16-17.
B. Non-Scientific Information

i. The Importance of Socioeconomic Information

From the start of negotiations, developing countries emphasized the importance of socioeconomic considerations to decision-making about agricultural biotechnology use in their territories. These comments continued throughout the negotiation. References to socioeconomic impacts and the potential adverse effects of biotechnology on social and economic welfare were also made repeatedly throughout the *African Draft Protocol* submitted to COP-3. Socioeconomic impacts were given higher priority by developing countries than some of the other significant elements of the *Protocol*, including the precautionary principle. Concern about these impacts was of such import to developing countries that it became a central component of the discussion surrounding numerous provisions within the draft *Protocol*, including the statement of the agreement’s objective, the risk assessment provision and the Preamble.

Developed countries resisted the inclusion of socioeconomic considerations within the *Protocol* and argued that they were more appropriately dealt with in domestic policy and legislation than in an international agreement. Yet as one activist astutely

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733 In some cases, developing countries called for social impact assessment within the *Protocol*. See e.g. (1996) 9:48 Earth Negotiations Bulletin (Sri Lanka).
734 See Chapter 3.
735 Supra, note 493. See e.g. the Preamble, Articles 1, 2, 4, 10. Article 12 even provides for financial and technical assistance to be provided to a party adversely impacted by import substitution.
736 In response, developing countries pointed out that an attempt to consider socioeconomic concerns domestically could be challenged under the WTO regime. Gupta, “Biosafety Regime”, *supra* note 73 at 216.
737 Aarti Gupta, “Framing ‘Biosafety’ in an International Context: The Biosafety Protocol Negotiations” (1999) at 16, online: Global Environmental Assessment Project <http://www.ksg.harvard.edu/gea/pubs.htm>. The U.S. delegation at the Ex-COP even argued that socioeconomic considerations were “non-negotiable” because they were outside the scope of the Jakarta mandate; he blamed developing countries for trying to overturn that mandate. Rafe Pomerance, Head of US Delegation to Ex-COP, Press Conference, 19 February 1999 cited in John Vogler & Désirée McGraw, “An international environmental regime for biotechnology” in Alan Russell & John Vogler, eds., *The politics of biotechnology: Investigating global futures* (Manchester: Manchester University Press, 2000) 123 at 131. Yet the Jakarta mandate states specifically that the BSWG is to “consider the inclusion” of
points out, socioeconomic considerations of Northern countries were behind developed country objections to the regulation of commodities via the AIA procedure.\(^{738}\) The same could be said more generally of developed country concerns about the impact of the Protocol’s provisions on liberalized trade.

During the negotiation, developing country delegates outlined some of the specific socioeconomic issues with which they were concerned, including dependence on the developed world,\(^{739}\) loss of exports,\(^{740}\) changes in existing socioeconomic patterns,\(^{741}\) effects that are “contrary to the...ethical and religious values of communities,”\(^{742}\) and impacts on employment, means of livelihood\(^{743}\) and culture.\(^{744}\) They also expressed a need for additional information about these potential impacts.\(^{745}\) This culminated in the adoption of a provision within the Protocol that encourages the Parties “to cooperate on research and information exchange on any socio-economic impacts of [LMOs], especially on indigenous and local communities.”\(^{746}\)

Developing country concern about the socioeconomic impacts of LMO use did not arise in a vacuum. As noted earlier in this thesis,\(^{747}\) the developing world had decades of experience with the social and economic effects of modern technology and Northern-inspired policies designed to improve agricultural productivity. The Green Revolution provides a telling example. Although its policies resulted in significantly larger yields in socioeconomic considerations in its elaboration of the Protocol. Decision 11/5, supra note 451, Annex at para. 2(b).

\(^{738}\) Stabinsky, supra note 34 at 279.
\(^{740}\) See e.g. African Draft Protocol, supra note 493, Article 7(3), Annex 2 at para. 7(d).
\(^{741}\) Ibid., Annex 2 at para. 7(a).
\(^{742}\) Ibid., Annex 2 at para. 7(f).
\(^{743}\) Ibid., Annex 2 at para. 7(d).
\(^{745}\) See Chapter 3.
\(^{746}\) Protocol, supra note 5, Article 26(2).
\(^{747}\) See Chapter 2.
many parts of the developing world, the Green Revolution adversely impacted the socioeconomic environment in developing countries to the detriment of many.

Even more compelling is evidence beginning to emerge regarding the socioeconomic impacts of the Gene Revolution. During the negotiations, the German Working Group on Biosafety summarized a report of the German Parliament which dealt with, *inter alia*, the socioeconomic impacts of biotechnology in the developing world. The report found that “only large farming operations might stand to benefit from GMOs, while 75% of the developing world’s farmers, who are smallholders, would not.”

More recently, the experience of Argentina has demonstrated the potentially adverse socioeconomic impacts of the Gene Revolution.

In Argentina, herbicide-resistant varieties of soybeans became available in 1996 and gained popularity with farmers throughout the remainder of the decade. The adoption of GM soybeans took on such enormous proportions that by 2002, 99% of soybeans planted in the country were herbicide-tolerant.

A primary response to the introduction of GM soybean varieties into Argentina has been the expansion of soybean farming. Since the debut of commercially available GM soybean seeds, the total soybean acreage has increased dramatically and production has

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750 This likely had something to do with the fact that Monsanto, the producer of herbicide-resistant soybean seeds, made the crop available in Argentina without the added cost of a royalty fee (approximately 35% of the cost of the seed in the U.S.). Now that the crop has become ubiquitous, Monsanto is negotiating a royalty payment system with the Argentinean government. In fact, in 2004 Monsanto suspended seed sales until it could ensure a “fair return” for its producers. *Ibid.* at 3, 14.
752 For the three years prior to the introduction of GM soybean varieties, soybean acreage increased an average of 0.23 million hectares each year. For the period from 1997-1999, soybean acreage increased more than 2 million hectares each year (ten times the rate of the earlier period). *Ibid.* at 11.
more than doubled.\textsuperscript{753} The increase in total soybean acreage has meant the conversion of marginal lands, forest, pasture and fields planted with other crops into soybean farms.\textsuperscript{754} In each case there have been adverse impacts. The expansion of soybean crops onto marginal lands has meant a reduction in crop yield.\textsuperscript{755} Conversion of forest to agricultural land has resulted in the displacement of “rural and forest” peoples, “the loss of their livelihoods and cultures” and increased levels of violence as people struggle “to preserve their homes and homelands.”\textsuperscript{756} The use of pastures and other crop lands for soybean production has led to a reduction in the food security of Argentinean people.\textsuperscript{757} Traditional food crops are being replaced with soybeans, 90\% of which are exported from the country.\textsuperscript{758} During a period of record soybean exports in 2002-2003, almost half of the Argentinean population lived below the poverty line.\textsuperscript{759} Moreover, since the introduction of GM soybean crops, “the share of the population facing hunger has risen sharply.”\textsuperscript{760}

The conversion of croplands to soybean production (and the reduction in practices such as crop rotation)\textsuperscript{761} has had other significant effects. Greater reliance on a

\textsuperscript{753} Ibid. at 26.
\textsuperscript{754} Ibid. at 11, 20-21. Other lands, including savannahs and wetlands, have also been converted to soybean production. (Ibid. at 21.)
\textsuperscript{755} Ibid. at 11. At the time that GM soybeans were introduced into Argentina, soybean yields were on the rise (using methods such as “improved weed control, less soil erosion, and more timely completion of planting operations”). The use of marginal lands to grow soybeans has resulted in a decrease in yield, although this is still small enough to ensure a net overall increase in yield over the last decade. Over the last few years, however, evidence has begun to emerge in both Argentina and the U.S. that GM soybean varieties are producing smaller yields than their conventional counterparts. (Ibid. at 11, 12.)
\textsuperscript{756} Ibid. at 21.
\textsuperscript{757} Ibid. at 26.
\textsuperscript{758} Ibid. at 15.
\textsuperscript{759} Ibid. at 16.
\textsuperscript{760} Ibid. at 26. In 2002, a campaign was launched by a farmers’ association to encourage soybean producers to donate 0.1\% of the annual harvest to feed the poor (despite the fact that soybeans are not a regular part of the Argentinean diet). The campaign received only 988 tons of soybeans; major agribusiness firms (Cargill, Monsanto and Bunge) each contributed a mere 30 tons each. Ibid. at 28.
\textsuperscript{761} Ibid. at 20.
monoculture means an escalation in the use of a single herbicide, reduction in the quality of the soil and, consequently, greater need for fertilizer (which has both economic and environmental impacts).\textsuperscript{762} Furthermore, it has resulted in greater economic vulnerability of the country because Argentina is increasingly dependent on a single export.\textsuperscript{763} This is exacerbated by the fact that the expansion of soybean production has displaced many small to mid-size farmers and has failed to create replacement jobs in the production and processing sectors.\textsuperscript{764} Accordingly, there has been a net loss of jobs. In 2003, the Argentinean government finally recognized the significant social problems that have been created by the growth of the GM soybean industry and committed itself to making improvements.\textsuperscript{765} The lesson learned by the country of Argentina is one that should be acknowledged and contemplated by the entire international community.

ii. Socioeconomic Information in the Protocol

Despite the significance of socioeconomic considerations to developing countries, the Protocol does little to ensure that the developing world has access to this type of information. The information share provision that relates to socioeconomic information merely “encourag[es]” Parties “to cooperate on research and information exchange.”\textsuperscript{766} There is no information sharing or research that is compelled by the Protocol. Moreover, no particular mechanism was formulated in the Protocol to facilitate cooperation on this issue. Although the BCH and capacity-building mechanisms of the Protocol provide means by which the exchange of socioeconomic information between Parties could be facilitated, it does not appear that either mechanism is being used to any significant

\textsuperscript{762} Ibid. at 20.
\textsuperscript{763} Ibid. at 15. Since 1997, the export of soybeans has increased 125%. (Ibid.)
\textsuperscript{764} Ibid. at 27.
\textsuperscript{766} Protocol, supra note 5, Article 26(2).
extent for this purpose. The BCH is used primarily as a forum for the exchange of
“scientific, technical, environmental and legal information” on LMOs.\textsuperscript{767} The \textit{Protocol}
also provides that the BCH may be used to “[a]ssist Parties to implement the \textit{Protocol},
taking into account the special needs of developing country Parties.”\textsuperscript{768} Although this is
certainly a broad enough mandate to encompass the sharing of socioeconomic
information, a search of the BCH reveals that the Parties have not yet made significant
use of the site for this purpose.\textsuperscript{769}

The language of the capacity-building mechanism of the \textit{Protocol} is even more
restrictive. It focuses almost exclusively on scientific and technical training, risk
assessment and technological and institutional capacities. Although there is nothing in
the language of the provision that precludes the transfer of socioeconomic information,
particularly given its focus on the needs and requirements of developing countries,
socioeconomic considerations are not a significant element of capacity building
programs.\textsuperscript{770} When the issue of socioeconomic considerations is raised in the context
of capacity-building workshops or meetings, it is most often by the representative of a
developing country or an NGO.\textsuperscript{771}

One final point must be made about the socioeconomic information available to
developing countries under the \textit{Protocol}. In addition to their efforts to insert a provision

\begin{footnotes}
\item[767] \textit{Ibid.}, Article 20(1)(a).
\item[768] \textit{Ibid.}, Article 20(1)(b).
\item[769] The BCH contains a Biosafety Information Resource Centre that contains a “virtual library” of
information on the \textit{Protocol} and related issues. This resource was searched, along with the discussion
forums on the BCH. The remaining databases on the BCH contain information on specific topics only, for
example laws and regulations, national contacts, laws and decisions. The BCH website can be viewed at
http://bch.biodiv.org/.
\item[770] See e.g. UNEP/GEF Building Capacity, supra note 712; GEF Support for Capacity-Building, supra note
706; Capacity-Building (Article 22, Article 28), UNEP/CBD/ICCP/3/6 (2002), Annex I, online: Convention
\item[771] See e.g. Anglophone Workshops, supra note 668 at 4 (Namibia); Final Report of Anglophone Workshops
on Development of Regulatory Regime, supra note 690 at 10 (S. Africa); Compilation of Submissions on
Capacity-Building, supra note 685 at 16 (WWF International).
\end{footnotes}
in the Protocol dealing with socioeconomic considerations, developing countries argued vehemently for the inclusion of a liability scheme within the agreement.\textsuperscript{772} These two requests from the developing world were very much related: the issues of liability and compensation are socioeconomic concerns. Should something go amiss with the application of agricultural biotechnology in their territories, developing countries want to know who will be responsible, whether they will be entitled to compensation and if so, how that compensation will be determined.

Despite developing country efforts, a liability scheme was not completed before the Protocol was finalized. Instead, a provision on liability and redress was included in the agreement that leaves the issue to be resolved by the COP-MOP. The provision notes that the Parties should “endeavour” to complete the process within four years, but does not impose a definitive deadline. As a result, developing country Parties to the Protocol must engage in decision-making (for at least several years) without relevant information about the structure of a liability and compensation mechanism.

\textbf{III. Decision-Making under the Protocol}

This section considers the ways in which decision-making by importing (developing) countries is limited by the provisions of the Protocol. Decision-making powers are circumscribed by way of deference to the international trade regime, exclusion of socioeconomic considerations, the restricted scope of the agreement, the narrow content of health and environmental considerations and the position of exporting states outside the biosafety regime.

\textsuperscript{772} See e.g. (1998) 9:108 Earth Negotiations Bulletin at 12. The author of this summary notes that “most developing countries have supported such a provision and at BSWG-5 their position took on near militancy.” (Ibid.) See also Chapter 3.
A. The Conflict Between Trade Agreements and the Protocol

The relationship and potential conflict between the Protocol and the agreements of the WTO were contentious issues throughout the negotiation of the Protocol and continue to generate considerable interest from academics and practitioners. Many commentators argue that the Protocol and the WTO Agreements are incompatible. Even a recent joint WHO and WTO report notes that some aspects of the agreements are inconsistent.\footnote{See Robert Howse, “The WHO/WTO Study in Trade and Public Health: A Critical Assessment” (2004) 24 Risk Analysis 501 at 505-506. Note that the author of this article takes issue with the conclusions of the WHO/WTO study regarding the incompatibility between the Protocol and the WTO Agreements.}

The text of the Protocol inadequately addresses this potential conflict.\footnote{There are a couple of instances within the Protocol where it appears that trade agreements are given explicit supremacy over the biosafety regime. The first is in Article 2, where the general provisions of the agreement are outlined. This article provides that a Party may “take action that is more protective” of biodiversity than is provided for under the Protocol as long as the action is “in accordance with that Party’s other obligations under international law.” Supra, note 5. The impact of this provision is problematic in light of the reduced scope of the Protocol, which is discussed in greater detail below. The second provision that gives apparent priority to the trade regime is Article 26, which provides that the Parties “in reaching a decision on import under this Protocol...may take into account, consistent with their international obligations, socio-economic considerations.” (Ibid.) The issue of the conflict between specific provisions of the WTO agreements and the Protocol is beyond the scope of this thesis. Some commentary that discusses this subject is referenced in the literature review in Chapter 1.} After considerable debate, three clauses were inserted into the Preamble to deal with the relationship between the Protocol and other international agreements. The first clause notes that “trade and environment agreements should be mutually supportive.”\footnote{Protocol, supra note 5, Preamble.} The latter two clauses provide that the “Protocol shall not be interpreted as implying a change in the rights and obligations of a Party under any existing international agreements” and that “the above recital is not intended to subordinate this Protocol to other international agreements.”\footnote{Ibid.}

These provisions of the Preamble leave the relationship between the WTO Agreements and the Protocol unclear. The failure to resolve this issue puts importing...
(developing) countries in a particularly difficult position. Utilizing the provisions of the
Protocol to restrict or deny the importation of LMOs may make these Parties vulnerable
to a legal challenge by exporting states. As discussed in greater detail below, such a
challenge would likely be initiated at the WTO in accordance with its dispute resolution
mechanism. A WTO dispute is a costly and lengthy proceeding that requires the input of
considerable resources. Such resources are not always available to developing countries.
Moreover, a challenge of this nature would have the effect of removing the regulation of
LMOs from the biosafety regime and placing it within the context of the trade regime.
This is something that developing countries would loathe to see happen; their
determination to adopt the Protocol was motivated, in part, by a desire to avoid this very
result. It remains to be seen what type of impact the threat of such a challenge will
have on the decision-making of developing countries; however, at a minimum there is
considerable pressure for them to be conservative in their decisions and to interpret
ambiguous provisions of the Protocol in the most trade-friendly manner possible.

B. Other Restrictions on Decision-Making

i. Socioeconomic Considerations

The ability of importing countries to rely on socioeconomic considerations in
decision-making under the Protocol is severely constrained. Article 26 states that Parties
may consider socioeconomic considerations “arising from the impact of [LMOs] on the

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777 A summary of the negotiation by the Earth Negotiations Bulletin notes that “[s]ome developing
countries believe that, with the proliferation of trade rules, the option for countries with limited scientific
and technological capabilities to refuse imports of new technologies or products is limited.” (1998) 9:108
Earth Negotiations Bulletin at 12.

778 Although “[t]he prospect of a developed country bringing a case against a developing country in relation
to a biosafety measure may be slim”, Mackenzie notes that the “threat of WTO litigation is powerful.”
Mackenzie, supra note 50 at 43-44.
conservation and sustainable use of biological diversity.\textsuperscript{779} In other words, socioeconomic considerations of all kinds cannot be considered in isolation; the socioeconomic consideration must arise because of an environmental impact of the LMO.

Two significant problems are created by the inclusion of this language within the provision. First, the overwhelming majority of socioeconomic concerns related to the use of LMOs do not arise because of an impact on the environment. Concerns such as the cost of the new technology, the use of scarce foreign currency for its purchase, the accessibility of rural farmers to modified seed, the potential dislocation of traditional farmers, the impact on the size and ownership of farms and the technological dependence of the South do not arise because of an impact on the conservation and sustainable use of biological diversity. As a result, most of the socioeconomic issues with which developing countries are concerned are excluded from consideration under the Protocol.

The exclusion of direct socioeconomic impacts from decision-making under the Protocol may certainly be linked to its status as a subsidiary agreement of the Convention. The Convention is, after all, an environmental treaty aimed at the conservation and sustainable use of biological diversity. As will be evident from the discussion below, however, a failure to consider direct socioeconomic impacts may indeed have an effect on the environmental issues targeted by the Convention and the Protocol.

To the extent that importing countries will be unable to incorporate socioeconomic considerations into their decision-making, a second problem arises. Several potential adverse environmental impacts of LMOs do not arise directly; rather, they arise because of an intermediary socioeconomic impact caused by the use of biotechnology. For example, an increased reliance on monoculture and the associated loss of traditional

\textsuperscript{779} Protocol, supra note 5, Article 26(1) [emphasis added].
varieties are adverse environmental impacts that might arise from an increase in the commercialization of farming within a country. That this type of change in the nature and scale of farming can result from the introduction of a new agricultural technology was evident to many countries during the Green Revolution. Moreover, as described in greater detail above, the experience of Argentina illustrates the sequence of problems that can occur. The use of agricultural biotechnology in that country has resulted in a dramatic increase in the production and export of soybeans. This, in turn, has significantly impacted the environment through an increased reliance on monoculture, a decrease in the quality of soil, increased reliance on fertilizer and the conversion of forest, savannah and wetland into farmers’ fields. Accordingly, it is particularly problematic that the socioeconomic provision of the Protocol removes from consideration any of the adverse environmental impacts of agricultural biotechnology that might arise indirectly.

ii. Scope of the Protocol

As outlined earlier, despite developing country requests for the broadest possible agreement on biosafety, the finalized Protocol is quite restricted in scope. LMOs in transit and LMOs destined for contained use are both excluded from the Protocol.\(^\text{780}\) Moreover, pharmaceuticals are not covered by the agreement. Although this does not appear to impact the use of agricultural biotechnology, the distinction between the two types of LMO may not be that easy to make.\(^\text{781}\) The Protocol also excludes products of LMOs (referred to as “products thereof” throughout the negotiation). During the negotiations, a coalition of NGOs distributed a paper listing many of the LMOs that

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\(^{780}\) A discussion of some of the problems with the Protocol’s definition of contained use is provided in Gupta, “Biosafety Regime”, supra note 73 at 212-213.

\(^{781}\) Ibid. at 212.
would be excluded from the *Protocol's* AIA procedure as a result of its provisions on scope. The examples included:

- transgenic fish for aquaculture (since this was seen as contained use),
- any LMOs intended for greenhouse experiments, all modified fruits, vegetables and tubers intended for human consumption...transgenic soya and maize intended for animal feed, transgenic canola for processing (which the paper noted was banned in France and Greece), and all modified micro-organisms intended for sewage treatment, the production of food enzymes, for use in yogurt, or for use in the production of pharmaceuticals for humans.

As discussed earlier, the most contentious issue regarding the scope of the *Protocol* during negotiations was the decision to exclude LMO-FFPs (commodities) from the AIA procedure. Although this category of LMOs remains a part of the *Protocol*, it is exempt from the regulatory structure of AIA and is subject instead to a much less rigorous mechanism. In fact, there is no specific procedure that must be implemented into domestic regulations when it comes to the import of LMO-FFPs as long as states act consistently with the “objective of the Protocol.” The *Protocol* requires exporting states to notify the BCH of domestic decisions regarding an LMO that may be subject to export; that state must include additional information in the notification to the BCH as well. Importing states are not given any direct notice of a potential export. As noted by one commentator, “[t]his procedure leaves the onus of responsibility to initiate action to prevent harm...on importing countries, a scenario that developing countries had sought to avoid.”

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783 Gupta, *ibid.*
785 Gupta, “Biosafety Regime”, *supra* note 73 at 220.
iii. Conservation, Sustainable Use and Health Impacts

The objective of the Protocol is "to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of [LMOs]...that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health." Yet, nowhere in the Protocol are "adverse effects on the conservation and sustainable use" or "taking...into account risks to human health" described or defined in any greater detail. There are indications that some countries believe that this ambiguous language is to be interpreted narrowly. If this is the case, the basis upon which importing countries can make decisions regarding the import of LMOs is restricted.

The language "taking...into account risks to human health" was inserted into the Protocol as a compromise between states that wanted health considerations included in decision-making and those that did not. The negotiating parties gave no further indication as to the meaning of this awkward phrase. Yet, some states have made it clear that they view relevant health risks as those that arise indirectly. In other words, the health risk must arise because of an impact on the conservation and sustainable use of biological diversity. If this is the case, the health risks of LMOs that are frequently cited, including allergenic effects and potential toxicity, would be precluded from consideration by importing states.

Furthermore, the exclusion of LMO-FFPs from the more rigorous AIA procedure of the Protocol indicates that the health risks of LMOs were not given priority in the

786 See Hillman, supra note 621 at 211; Gupta, "Biosafety Regime", supra note 73 at 211 (referencing confidential interviews 1998-2000).
agreement. Developing countries raised concern about this matter during negotiations, but to no avail.\textsuperscript{787}

The language regarding potential adverse effects on the conservation and sustainable use of biological diversity poses additional problems for importing states. What constitutes an adverse effect? Given the limited interpretation of health impacts noted above and the very restrictive way in which socioeconomic considerations are contemplated in the Protocol, it is likely that environmental impacts will also be narrowly construed.\textsuperscript{788}

For example, direct impacts on the conservation and sustainable use of biodiversity may be said to arise if nearby plants are contaminated, “superweeds” are created or GM plants become increasingly invasive. But what about impacts like the development of herbicide resistance in insects or an increased reliance on herbicide?\textsuperscript{789} Are these impacts on the conservation and sustainable use of biodiversity? Are the impacts sufficiently

\textsuperscript{787} Gupta, “Biosafety Regime”, \textit{ibid.} at 213-214.

\textsuperscript{788} Support for this interpretation also comes from the \textit{Panel of Experts Report}, which lists the concerns raised by LMOs “[f]rom the perspective of the Convention.” The issues listed include direct impacts (stability of the inserted genes, impact on non-target species, potential for weediness of the LMO). There is one concern listed that is broad enough to encompass both direct and indirect effects (adverse effects on ecosystem processes), but in the context of the other items on the list, it seems appropriate to limit it to direct effects only. None of the potential indirect effects described earlier in this thesis, for example the promotion of uniform crop systems, a reduction in the use of traditional varieties or an increase in the use of herbicides, are listed here. \textit{Panel of Experts Report, supra} note 435 at para. 40. Moreover, the Panel notes later in its report that it is limiting itself to the “[p]otential primary effects” of LMOs, which it defines as “those that might result directly from the transfer of genetic material from the LMO to other organisms and from the LMO itself on other organisms.” The Panel describes secondary effects as “those that might arise from primary effects” and lists “broader cultural and socio-economic transformations” as included in this category. (\textit{Ibid.} at para. 66.)

\textsuperscript{789} Despite claims by many that the use of agricultural biotechnology will reduce the amount of pesticide sprayed on crops, a recent study focusing on the U.S. demonstrates that this is not the case. Although the first three years of commercial use of LMOs revealed a reduction in pesticide use (and resulted in many of the claims that this would be the long term impact), since 1999 total pesticide use on GM crops has increased. This is the result of an increase in the use of herbicide on herbicide-tolerant GM plants (the use of insecticide on Bt crops has actually dropped, but the increase in herbicide use more than accounts for the difference). Charles M. Benbrook, “Genetically Engineered Crops and Pesticide Use in the United States: The First Nine Years” (2004), online: Ag Biotech Infonet <http://www.biotech-info.net/>. An increase in the use of herbicide as a result of the introduction of herbicide-resistant soybeans has also occurred in Argentina. See Benbrook, “Argentina”, \textit{supra} note 749 at 32.
direct to fall within the *Protocol's* scope? Herbicide resistance in insects may arise because the use of herbicide-tolerant GM plants leads to an over-reliance on one particular herbicide. This is not a direct impact. Planting the herbicide-tolerant plant does not, in and of itself, pose a risk to the environment. It is the over-reliance on one particular herbicide (the one to which the plant is made resistant) that may lead to herbicide resistance in insects. Similarly, increased reliance on herbicides requires intervention (increased spraying), not simply the planting of a GM crop, in order to have an adverse impact on the environment (and, consequently, on biodiversity). As a result, it is likely that decision-making with respect to the environmental impacts of LMOs is also restricted under the terms of the *Protocol*.

C. Non-Parties to the *Protocol*

Perhaps the most significant constraint on the decision-making powers of importing countries is the fact that the major biotech-exporting states have not become Parties to the *Protocol.* In fact, none of the six Miami Group members have ratified the agreement. This has important consequences for developing country Parties who wish to rely on the mechanisms of the *Protocol* to ensure the safe transboundary transfer of LMOs into their territories.

Under international law, a treaty is binding only between the parties to it. This general rule is grounded in the fundamental notion of state sovereignty. The corollary to this principle, generally viewed as customary international law, is that treaties create

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790 As of 31 August 2005.
neither rights nor obligations for third party states without their consent.\(^\text{792}\) This consent must be given under certain conditions, as outlined in the provisions of the \textit{VCLT}. A right may be granted to a third party state if the parties to the treaty intend this result and the third party state consents, implicitly or explicitly, to it.\(^\text{793}\) Although this is the formal statement of the rule, there has been some disagreement among authorities, including some members of the International Law Commission, regarding the necessity of an act of acceptance by the state upon which a right has been conferred.\(^\text{794}\) Nonetheless, the ILC has stated that Article 36 of the \textit{VCLT} presumes the consent of a third party state in circumstances where a right has been granted to it by the provision of a treaty.\(^\text{795}\)

With respect to the imposition of obligations on a third party state, the circumstances that must be met are more rigorous. For such an obligation to be imposed, the parties to the treaty must intend that the provision establishes the obligation in question and the third party state must expressly accept the obligation in writing.\(^\text{796}\)

In the context of the \textit{Protocol}, importing countries cannot impose obligations upon exporting states unless the latter have given their explicit consent. From the limited information made available by the primary exporting states,\(^\text{797}\) it cannot be said that they


\[^{793}\text{VCLT, ibid., Article 36; Brownlie, \textit{ibid.} at 599.}\]

\[^{794}\text{Brownlie, \textit{ibid.}}\]

\[^{795}\text{This is the case as long as the third party state does not indicate the contrary and the treaty does not provide otherwise. Brownlie, \textit{ibid.} at 600; see also Aust, \textit{supra} note 792 at 208.}\]

\[^{796}\text{VCLT, supra note 792, Article 35.}\]

\[^{797}\text{Chile is a signatory to the \textit{Protocol} but has not yet ratified the agreement. It has no official statement outlining its position regarding the \textit{Protocol}'s obligations. Pablo Romero, General Consul of Chile, pers. comm., 10 May 2005.}\]
have consented to be bound to the terms of the Protocol.\textsuperscript{798} The government of Canada
has indicated “its support for the objective” of the Protocol and its commitment to
“creating the conditions that would allow Canada’s ratification” of the agreement.\textsuperscript{799} The
conditions that it lists are extensive and include “the need for clarification” on most of the
significant issues and mechanisms contained within the Protocol.\textsuperscript{800} Australia goes
further, acknowledging that if their “key trading partners become Parties to the Protocol,
Australian trade in LMOs would be affected...regardless of whether [they] become a
Party.”\textsuperscript{801} Yet this cannot be viewed as consent to be bound; for example, Australia
might simply be referring to the fact that imports into Australia would be affected given
that exporting Parties must abide by the objective of the Protocol. Moreover, Australia
notes in the same document that it is “assessing [its] interests in the Protocol” in an effort
to decide whether to sign the agreement.\textsuperscript{802} The U.S. has indicated that it “would like to
see the Protocol practically and effectively implemented” and that it will assist in
“forg[ing] a constructive process toward implementation.”\textsuperscript{803} These statements do not
constitute explicit consent to be bound by the agreement.

Perhaps a better indication of the intentions of the U.S. and the other major biotech
exporters may be gleaned from some of the activities they have undertaken since the
Protocol was finalized in January 2000. In 2002, for example, the U.S. shipped GM
food aid to six countries of Sub-Saharan Africa without first obtaining their

\begin{itemize}
\item \textsuperscript{798} Some commentators make reference to the fact that the U.S. agreed to be bound by the Protocol during
the negotiations; however this promise has not been reiterated in official statements. See e.g. Glass, \textit{supra}
note 729 at 511.
\item \textsuperscript{799} “Canada’s Position on the Ratification of the Cartagena Protocol on Biosafety” (18 November 2003),
\item \textsuperscript{800} \textit{Ibid.}
\item \textsuperscript{801} Hillman, \textit{supra} note 621.
\item \textsuperscript{802} \textit{Ibid.}
\item \textsuperscript{803} U.S. Statement, \textit{supra} note 621.
\end{itemize}
authorization. When these countries objected, the U.S. refused to assist in meeting their concerns by milling the food. This behaviour by the U.S. hardly seems consistent with either the objective of the Protocol or the principle of informed consent that the U.S. has openly advocated.

As mentioned earlier, in 2003 the U.S., Canada and Argentina submitted claims to the dispute resolution mechanism of the WTO arguing that the EU’s “de facto moratorium” on the import of LMOs was an infringement of their rights under the trade regime. The U.S. alone demanded $1.8 billion in damages for loss of exports to the EU. The conflict revolves around interpretation of provisions within the SPS Agreement that deal with “scientific justification” and “risk assessment.” Although the precautionary approach is enshrined within the Protocol’s decision-making procedures, the EU is being forced to justify its measure in a WTO tribunal. Moreover, the claimants have maintained the proceeding despite the fact that the EU has enacted new GM legislation, has “begun to receive new GMO applications” and has issued one approval for consumption of a GM corn variety.

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805 The EU objects to the characterization of its regulations as constituting a de facto moratorium. See Amicus Brief, supra note 660 at 10.

806 A panel has now been formed to settle the conflict. WTO, European Communities - Measures Affecting the Approval and Marketing of Biotech Products - Constitution of the Panel Established at the Requests of the United States, Canada and Argentina - Note by the Secretariat, Doc. 04-0987 (5 March 2004), online: World Trade Organization <http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds291_e.htm>.


809 Winickoff et al., ibid. at 89-90.
This proceeding provides some evidence that exporting states will protect their trade interests through recourse to WTO dispute resolution.\textsuperscript{810} Even more significant, however, is the fact that U.S. trade officials "believed such a challenge...was necessary to discourage other countries, especially those in the developing world, from adopting the European regulatory approach."\textsuperscript{811}

More recently, the U.S. along with Canada and Mexico signed a trilateral agreement on documentation requirements for LMO-FFPs.\textsuperscript{812} This arrangement permits shipments of commodities that may contain up to 5\% LMO content without requiring documentation. During the negotiation, many regarded this pact as "running counter to the spirit and intent of the Protocol, and, importantly, as having the adverse potential to start a domino effect across the American continent if other countries follow suit."\textsuperscript{813} Despite these protests, however, the U.S. stated that it believes the agreement is consistent with the Protocol's requirements and that its involvement demonstrates a "willingness to work constructively towards a practical and workable implementation of the Protocol."\textsuperscript{814}

Finally, reports have been made regarding tactics being used to influence the development of biotechnology policy in some developing countries. One commentator notes that "countries are coming under pressure...from countries seeking to secure

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{810} In fact, some of the primary biotech exporting states have noted that implementation of the Protocol within a country must be done in a manner consistent with that state's WTO obligations. This implies that, even in situations where both exporter and importer are Parties to the Protocol, WTO obligations must be respected. See e.g. Hillman, supra note 621.
\item \textsuperscript{811} Pew Initiative on Food and Biotechnology, "U.S. v. EU: An Examination of the Trade Issues Surrounding Genetically Modified Food" (2003) at 11, online: Pew Initiative on Food and Biotechnology <http://pewagbiotech.org/resources/issuebriefs/europe.pdf> [emphasis added].
\item \textsuperscript{812} Documentation Requirements for Living Modified Organisms for Food or Feed, or for Processing (LMO/FFPs), Canada, United States of America, Mexico, October 2003, online: Agriculture and Agri-Food Canada <http://www.agr.gc.ca/itpd-dpci/english/topics/bsp_trilateral.htm>.
\item \textsuperscript{813} (2004) 9:289 Earth Negotiations Bulletin at 11.
\item \textsuperscript{814} U.S. Statement, supra note 621.
\end{itemize}
\end{footnotesize}
reflection of their own regulatory models elsewhere.\textsuperscript{815} As an example, she refers to the expression of concern by the U.S. to China over the introduction of new agricultural biotechnology regulations in that country. The U.S. influence “result[ed] in a change to interim regulations to avoid disruption of US agricultural exports.”\textsuperscript{816} Other examples of bilateral pressure being exerted on countries while they “prepare national GMO regulations” include Bolivia, Sri Lanka and Croatia.\textsuperscript{817}

Since the biotech-exporting states are not bound by any of the provisions of the Protocol, their participation in the decision-making mechanisms of the agreement is voluntary. This enables the exporters to engage in the aspects of the Protocol that offer them benefit (e.g. capacity-building) without the need to abide by restrictions that are unfavourable to them.\textsuperscript{818} In most instances, it will be the WTO agreements that bind both parties engaged in the transboundary transfer of an LMO that may be invoked if an exporting state feels that its rights have been breached. In this way, the decision-making powers of importing states under the Protocol are significantly constrained.

IV. Conclusion

For importing (developing) countries, the Protocol fails to live up to early expectations that it would provide a means of enabling informed decision-making regarding the use of agricultural biotechnology in their territories. Instead, the provisions of the Protocol unduly restrict the quality and quantity of information available to these

\textsuperscript{815} Mackenzie, supra note 50 at 37.
\textsuperscript{816} Agriculture and Biotechnology in US Foreign Policy, Statement by Alan P. Larson, Under Secretary for Economic, Business and Agricultural Affairs, to the Commodity Club of Washington DC, 10 April 2002, available at http://www.state.gov cited in Mackenzie, \textit{ibid.} at 37.
\textsuperscript{818} This is already the position in which the biotech industry finds itself. For example, during negotiations on liability the Global Industry Coalition argued that since the Protocol and the Convention are agreements between states, liability should rest with them. Newell & Glover, \textit{supra} note 52 at 22.
states and the nature of decision-making powers granted to them. This is of particular concern given developing countries’ limited experience with biosafety issues, their vulnerability to the risks of agricultural biotechnology use and the significance of informed decision-making to their economic and social well-being. As noted by the African delegates\textsuperscript{819} to the FAO negotiations on the International Undertaking for Plant Genetic Resources, “Western science” will only be able to play a role in the improvement of agricultural production in the developing world if it is able to “address the real needs of [African] people.”\textsuperscript{820} These needs cannot be met if the opportunity and means of making informed decisions are not enabled for these individuals and their governments.

\textsuperscript{819} With the exception of the South African delegate.
\textsuperscript{820} “Nature’s Harvest”, supra note 367.
CHAPTER V - CONCLUSION

The adoption of the Cartagena Protocol on Biosafety in January 2000 was a significant achievement for the many parties involved in its negotiation. The states, international organizations, industry groups and non-governmental organizations that met numerous times over the course of four years faced many difficult obstacles to the completion of the first legally binding agreement on biosafety. Vast differences in experience, knowledge and resources set the delegates apart and contributed to the broad range of opinions and demands outlined by various stakeholders throughout the negotiation. The conflicts that emerged between the parties were sometimes incapable of resolution; at one point they resulted in the collapse of negotiations and a significant delay in the conclusion of the Protocol. As a consequence, some conflicts were left to be worked out at a later date. Negotiations between states to finalize the details of the agreement will continue in various fora throughout the next several years.

The Protocol was an initiative of developing countries, who fought hard to bring the agreement to fruition. Yet this thesis has argued that the Protocol does not adequately address developing country concerns because the mechanism of informed decision-making upon which it is based is flawed. The Protocol is premised on a narrow conception of developing country interests and, as a consequence, provides inadequate information and insufficient decision-making powers to decision-makers in importing (primarily developing) states.

In analyzing the development and implementation of the Protocol, this thesis attempted to elaborate upon developing country interests and to outline some of the cultural, social, economic and historical grounds upon which they are based.
Accordingly, it began with a consideration of some of the myriad circumstances and events that have shaped developing country attitudes toward biotechnology and biosafety. These circumstances include decades of experience with the development, trade and food security policies of developed countries. These policies have created and exacerbated conditions that contribute to the poverty and food security woes that plague the developing world. Developing countries have made attempts to strengthen their export sectors but have been frustrated in their efforts by import tariffs, depressed commodity prices and distorted competition resulting from developed country subsidies. Their debts have grown enormously, foreign agricultural aid has decreased, and developing countries have been left with fewer resources to feed their own populations. Moreover, food aid policies intended to assist developing countries have prioritized developed country interests over developing country needs.

The perspective of developing countries has also been shaped by the experiences of the Green Revolution. This program, which was sponsored by private foundations, international organizations and developed countries in the 1960s and 1970s, is still promoted today as an effective means of combating food insecurity in the developing world. Yet, although the Green Revolution was successful in raising yields and increasing food production, it did not lay "the spectre of famine to rest" as predicted by one of its most ardent advocates.\(^\text{821}\) In fact, increases in yield during the Green Revolution were not always associated with improvements in food security. This was due, in large part, to a mistaken belief that the technology was neutral. In other words, there was a failure to recognize that technologies impact, and are impacted by, the cultural and socioeconomic environment into which they are introduced. Many countries

\(^{821}\) Brown, \emph{supra} note 164 at 132.
learned that in order to evaluate the appropriateness of a technology, a broader context must be taken into account that extends beyond purely technical considerations.

This broader approach was adopted by developing countries during the negotiation of the Protocol. They sought an agreement that offered the maximum protection and choice to importing states. They wanted the Protocol to be as broad in scope as possible and, therefore, sought an agreement that covered all forms of LMOs, including products thereof, and that encompassed transboundary movements in addition to domestic handling and use. Developing countries wanted an agreement that was given precedence over the trade regime, maximized environmental protection, and permitted consideration of health and socioeconomic considerations in decision-making.

In contrast, developed countries sought a narrow, science-based Protocol that regulated transboundary movements of LMOs only. Although many developed countries advocated a precautionary agreement, the members of the Miami Group resisted this approach. The Miami Group also insisted that the Protocol be subordinate to the agreements of the WTO. For this group of states, the primacy of the liberalized trade regime was a high priority.

Given the differing perspectives of these two groups of states, it is not surprising that the negotiation of the Protocol was shaped, in large part, by conflicts between developing countries and the biotech-exporting states of the Miami Group. Their opposing views created significant obstacles to the completion of the agreement.

Early in the negotiations states were in general agreement that the Protocol should be premised on the notion of informed consent by importing states. For developing countries, calls for informed decision-making were premised on the unique circumstances
and challenges they face with respect to biosafety and agricultural biotechnology use in their territories. Moreover, independent and informed decision-making is necessary to ensure that developing countries have control over policy decisions that impact their economic and social well-being. Where this control is threatened, the welfare of their citizens may be adversely impacted.

Although developed countries initially supported this concept, informed decision-making was significantly eroded in the final text of the *Protocol*. Importing (primarily developing) states are provided with insufficient information and inadequate decision-making powers under the agreement’s regime. This restricted version of informed decision-making was, in part, the product of developed countries’ narrow views of “biosafety.” These countries regard biosafety as the technical aspects of ensuring that the environment (and to a lesser extent, health) is not adversely impacted by the use of biotechnology. In contrast, developing countries view biosafety as a much broader concept that encompasses a consideration of the merits of biotechnology use and the longer term social, economic and environmental implications of this technology.

Informed decision-making is constrained within the *Protocol* in numerous ways. The agreement is science-based and relies on the provision of “objective” scientific information as the basis for risk assessment. Yet this ignores the value-laden nature of scientific knowledge and fails to take into account the fact that information is impacted by the social, cultural and economic environment in which it is generated. This is particularly significant in areas where “scientific” issues are contested – as in the realm of agricultural biotechnology.
The value-laden nature of scientific knowledge is particularly relevant in the context of the *Protocol* because information will be passed primarily from developed to developing countries. Given the significant differences that exist between these two groups of countries, concerns arise that the transfer of scientific knowledge from one environment to another may have adverse effects.

Not only do the mechanisms of the *Protocol* ignore the values and assumptions inherent in scientific information, but they also fail to account for the social, political, economic and cultural environments into which information is being transferred. Public participation is not incorporated into risk assessment procedures, consideration of socioeconomic, political and cultural issues are excluded from a determination of the manageability of risks and importing states receive inadequate risk assessment information for LMO commodities. Moreover, the provision of information regarding the socioeconomic impacts of biotech use is not compelled under the *Protocol*. Despite these shortcomings in the risk assessment information received by importing states, these countries are made legally responsible for the management of risks within their territories.

Issues also arise with respect to the information provided under the capacity-building provision of the *Protocol*. This information is being provided by developed countries, international organizations and industry groups that have very specific views on the merits of agricultural biotechnology and the means by which it should be regulated. Moreover, these entities have a particular interest in the spread of agricultural biotechnology to the developing world. These views impact the manner in which developed countries, international organizations and industry groups approach the
interpretation and implementation of the Protocol. As a consequence, concerns arise regarding the impact that these views will have on capacity-building. These concerns are particularly acute given the significance of capacity-building to developing countries and the importance of capacity-building in shaping future biosafety policies and mechanisms within these countries.

In addition to the constraints on information provided under the mechanisms of the Protocol, the scope of decision-making by importing (developing) states is limited. One way in which decision-making is restricted is through deference to the trade regime of the WTO. This is accomplished through specific language in the text of the Protocol but also because biotech-exporting states remain outside of the Protocol’s regime. Decision-making is also constrained by the limited scope of the agreement, the effective exclusion of socioeconomic considerations (and, accordingly, indirect environmental considerations) and the narrow content that will likely be ascribed to health and environmental impacts.

From the start of the Protocol’s negotiations, developing countries desired what developed countries have already been able to exercise: a right to informed decision-making regarding the use of biotechnology within their territories. Yet the final text of the Protocol provides a constrained version of informed decision-making that leaves importing states with inadequate information and insufficient decision-making powers. Given the fact that the Protocol has only recently entered into force, the full impact of its regulatory mechanisms remains to be seen. Many significant factors, including the interpretation given to the Protocol’s text, the extent of participation by biotech-exporting states and the relationship between the Protocol and the WTO regime, will have
considerable influence on the future success of the *Protocol*. It is my hope that with an improved understanding of the issues at stake and the limitations of the *Protocol*’s text, those engaged in the implementation of the agreement will be able to better address the needs of developing states and the challenge of ensuring the appropriate and safe use of biotechnology to improve the well-being of their citizens.
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