The Role of International Agreements in Achieving Food Security: How Many Lawyers Does It Take to Feed a Village?

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ABSTRACT

This Article discusses how international agreements impact the ability of science and technology to enhance food security. International agreements, domestic laws, and regulations have the power to promote scientific research and the adoption of new technology through effective, efficient, and predictable science-based regulatory systems, or to impede development and adoption of new technology by miring it in burdensome or unnecessary regulations. This Article examines the disparate impacts of international agreements on food security through a case study of agricultural biotechnology. In particular, the Article looks at the principles and guidelines for risk assessment developed by the Codex Alimentarius Commission and the Cartagena Protocol on Biosafety to the Convention on Biological Diversity. The Article concludes that agreements related to biosafety and sustainable development may have impacts beyond their stated objectives that can negatively impact efforts to achieve food security. By ensuring that a wider range of interests are considered in the development of these agreements, the final agreements will better reflect the economic and social realities of all the parties.

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Science and technology have an important impact on the quality, quantity, and availability of food in the developing world with regard to the "four food groups": food security, food safety, food policy, and food defense. While the main impact of science and technology is at the local level, many of the policies and rules that promote or stifle technological development are established at the international level. This Article will discuss how international agreements impact the ability of science and technology to enhance food security in the developing world.

According to the African Union (AU) report, *African Common Position on the Review of the Millennium Declaration and the Millennium Development Goals,* "[t]he acquisition and use of science and technology is critical in raising food production and extending productive opportunities outside the traditional land resources and in ensuring food availability, affordability and stability of access."[1] International agreements and domestic laws and regulations have the power to promote scientific research and adoption of new technology through effective, efficient, and predictable science-based regulatory systems, or to impede development and adoption of new technology by miring it in burdensome or unnecessary regulations. If the policymakers and the lawyers can achieve the right balance—between innovation and safety on the one hand, and productivity and the environment on the other—then new technologies will reach the farmer. With that and a little luck, food security will increase.

Of course, achieving the appropriate balance is not easy. International agreements can facilitate access to and adoption of new

1. African Union, *African Common Position on The Review of the Millennium Declaration and The Millennium Development Goals*, at xvii (May 2006), *available at* http://www.africa-union.org/root/AU/Conferences/Past/2006/December/MDG/AU%20Report_no_ hypen1.pdf [hereinafter *African Common Position*].

technology by promoting a domestic regulatory environment conducive to technology development and commercialization. Alternatively, international agreements can slow the introduction of technologies by establishing barriers to development, commercialization, and trade in new products.

Predictable, science-based regulatory systems that balance the need for technological innovation with the important goals of biosafety and sustainable development are critical components of the economic development framework for the acquisition and use of science and technology that policy makers in developing countries must address to achieve their food security goals.[2]

The question is: how can international agreements promote advances in agricultural productivity and quality while maintaining appropriate concern for biosafety and the sustainability of food producing habitats?

This Article approaches this question through a case study of one of the newest and perhaps most controversial technologies that could be available to farmers in the developing world—agricultural biotechnology. The Article will examine how international agreements have facilitated the adoption of or created barriers to the adoption of the technology.

I. THE CASE OF AGRICULTURAL BIOTECHNOLOGY

Agricultural biotechnology, or modern biotechnology,[3] allows scientists to select individual genes from one organism and insert them into another, including genes from unrelated species. After the genetic transfer, the resulting bioengineered plants or organisms, sometimes referred to as genetically-enhanced (GE) or genetically-modified organisms (GMOs), are able to express a new trait such as resistance to certain pests or herbicides.[4] In 2006 alone more than

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2. U.N. Univ. Inst. of Advanced Studies [UNU-IAS], *Trading Precaution: The Precautionary Principle and the WTO*, at 2 (Nov. 2005) (*prepared by* Sabrina Shaw and Risa Schwartz).

3. Modern biotechnology refers to "*in vitro* nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or fusion of cells beyond the taxonomic family that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection." Cartagena Protocol on Biosafety to the Convention on Biological Diversity, art. 3, Jan. 29, 2000, *available at* http://www.cbd.int/doc/legal/cartagena-protocol-en.pdf [hereinafter CPB].

4. Debra M. Strauss, *The International Regulation of Genetically Modified Organisms: Importing Caution Into the U.S. Food Supply,* 61 FOOD & DRUG L.J. 167, 167 (2006); Food & Agriculture Organization of the U.N. [FAO], *The State of Food and Agriculture, 2003–2004: Agricultural Biotechnology: Meeting the Needs of the Poor*, FAO Agriculture Series (SOFA), No. 35, at 8 (2004), *available at* ftp://ftp.fao.org/docrep/fao/006/y5160e/y5160e01.pdf [hereinafter SOFA].

250 million acres of biotech crops were planted in twenty-two countries around the world, including developing countries such as South Africa, Brazil, China, and India.[5] More than ninety percent of the farmers using the technology are in the developing world.[6]

Despite the promise of the technology, the regulatory systems needed to commercialize these products constitute major hurdles for developing countries. These countries often lack the regulatory frameworks and technical capacity necessary to evaluate the environmental safety and food safety of the crops.[7] International bodies that establish global standards for the assessment of bioengineered crops provide developing countries with models for reviewing new crops and reassure export markets of the products' safety.[8]

By facilitating the adoption of domestic regulatory systems for the review of bioengineered crops, international agreements can have a direct impact on the dissemination of the technology to farmers. The Codex Alimentarius Commission (CAC) provides such a globally-recognized model for food safety reviews of bioengineered plants.[9]

A. *Facilitating Science and Technology: Codex Alimentarius Commission*

The Codex Alimentarius Commission was created in 1963 by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) to develop food standards, guidelines, and texts.[10] The CAC is founded on the principle of science-based decision making in standard settings.[11]

In 2003 the CAC adopted two key texts that relate to biotech crops: (1) *Principles for the Risk Analysis of Foods Derived from Modern Biotechnology* (the "Principles") and (2) the *Guideline for the*

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5. Clive James, *Brief 35: Global Status of Commercialized Biotech/GM Crops: 2006*, International Service for the Acquisition of Agri-biotech Applications, ISAAA Brief No. 35-2006, at 4 (Jan. 18, 2007), *available at* http://www.isaaa.org/resources/publications/briefs/35/executivesummary/pdf/Brief%2035%20-%20Executive%20Summary%20-%20English.pdf.

6. Countries commercially producing biotech crops include: United States, Canada, Mexico, Honduras, Colombia, Brazil, Argentina, Paraguay, Uruguay, Spain, France, Germany, Czech Republic, Portugal, Romania, Slovakia, Iran, South Africa, China, Philippines, Australia, and India. *Id.*

7. SOFA, *supra* note 4, at 4.

8. *See, e.g.*, Food and Agriculture Organization of the United Nations World Health Organization [FAO/WHO] Food Standards: Codex Alimentarius, http://www.codexalimentarius.net (last visited Sept. 19, 2007) (discussing the purpose of the Codex Alimentarius Commission).

9. *Id.*

10. *Id.*

11. FAO/WHO, *Understanding the Codex Alimentarius*, at 21 (2006), *available at* ftp://ftp.fao.org/codex/Publications/understanding/Understanding_EN.pdf.

Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants (the "Guideline").[12] The Principles represent a global consensus on the relevant factors that should be taken into account when conducting a risk analysis of biotech foods. The Guideline represents the relevant factors in assessing the food safety and nutritional aspects of biotech foods.[13]

The Guideline and the Principles, together, serve as a framework for developing countries considering laws or regulations for the approval of biotech crops. As a result, developing countries are better positioned to take advantage of biotechnology to address their food security needs.

B. *Biosafety: Cartagena Protocol on Biosafety to the Convention on Biological Diversity*

The Cartagena Protocol on Biosafety (CPB), which became effective on September 11, 2003, is a multilateral environmental agreement that seeks to regulate the safe transfer, handling, and use of "living modified organisms" (LMOs) in order to limit the impact of LMOs on biodiversity.[14]

The CPB seeks to ensure an adequate level of protection for LMOs that might have adverse effects on biodiversity.[15] While the Codex texts provide a path to approval for bioengineered plants by establishing a global standard for the food safety assessment of these

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12. FAO/WHO, Codex Alimentarius Commission [CAC], Joint FAO/WHO Food Standards Programme, *Foods Derived from Biotechnology*, at iii (2004), *available at* ftp://ftp.fao.org/docrep/fao/007/y5819e/y5819e00.pdf. Historically, new varieties of food plants have not been regularly evaluated for toxicity or allergenicity or nutritional composition prior to marketing. *Id.* at 12. "New varieties of corn and soya, potatoes and other common food plants are evaluated by breeders for agronomic and phenotypic characteristics." *Id.* Generally, however, "foods derived from such new plant varieties are not subjected to the rigorous and extensive food safety testing procedures . . . that are typical of chemicals . . . or pesticide residues that may be present in food" and which are now common for foods derived from modern biotechnology. *Id.*

13. CAC, *Principles for the Risk Analysis of Foods Derived From Modern Biotechnology*, CAC/GL 44-2003, § 2, ¶ 7 (2003), *in* FAO/WHO, *supra* note 12, at 2; CAC, *Guideline for the Conduct of Food Safety Assessment of Foods Derived From Recombinant-DNA Plants*, CAC/GL 45-2003, § 3, ¶ 18 (2003), *in* FAO/WHO, *supra* note 12, at 11.

14. *See* CPB, *supra* note 3, art. 1.

> In accordance with the precautionary approach contained in Principle 15 of the Rio Declaration on Environment and Development, 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 living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.

15. *Id.*

crops, the CPB is primarily concerned with regulating the transboundary movement of LMOs that have been approved in the country of export,[16] not with establishing a regulatory framework for ensuring the biosafety of products under development.[17]

While parties to the CPB are required to establish a biosafety system, there are no guidelines within the Protocol that would help countries establish a system for reviewing products for environmental safety.[18]

1. View from Africa

Thirty-seven African countries have ratified or acceded to the CBP.[19] However, only one country, South Africa, has commercialized any biotech products.[20] Some countries have cited the CPB in making decisions to ban bioengineered products or impose moratoria on biotechnology research.[21]

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16. The environmental focus of the agreement limits its application to only those genetically modified organisms that have the ability to propagate in the environment, such as seeds and microorganisms, and excludes biotech foods that have been processed in such a way as to eliminate their viability in the environment. In addition, the agreement distinguishes between LMOs that are destined for introduction into the environment, which receive heightened scrutiny for environmental impact through more detailed documentation requirements, and those LMOs destined for food, feed, or for processing (LMO-FFPs), which are subject to more limited documentation requirements. CPB, *supra* note 3, arts. 4, 18.

17. Secretariat of the Convention on Biological Diversity and the U.N. Environment Programme, *Biosafety and the Environment: An Introduction to the Cartagena Protocol on Biosafety*, at 5 (June 2003), *available at* http://www.cbd.int/doc/press/presskits/bs/cpbs-unep-cbd-en.pdf. Recognizing the need for such guidance, the parties to the CPB have set up an Ad Hoc Technical Group on Risk Assessment to identify existing guidelines and standards for parties. *See* Conference of the Parties to the Convention on Biological Diversity Serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety, Curitiba, Braz., Mar. 13–17, 2006, *Risk Assessment and Risk Management (Articles 15 and 16)*, ¶¶ 2–3, UNEP/CBD/BS/COP-MOP/3/9 (Jan. 17, 2006). The Technical Group reported at the last Meeting of the Parties in 2006 that there already existed a great deal of information relevant to risk assessment of LMOs. *Id.* ¶ 16. However, the group also pointed out that there were limitations in the accessibility and usefulness of existing information to support risk assessment. *Id.* ¶ 17. The Technical Group nevertheless concluded: "At this time, further generic guidance that is applicable to all assessments of risk as outlined in annex III of the Protocol (e.g., all types of organisms, traits, and all types of hazards) is not a priority." *Id.* ¶ 14.

18. *See generally* CPB, *supra* note 3, art. 18 (outlining specific requirements for biosafety systems without including implementation guidelines).

19. United Nations Environment Programme [UNEP], *African Environment Outlook 2: Our Environment, Our Wealth*, at 321 (2006), *available at* http://www.unep.org/DEWA/Africa/docs/en/AEO2_Our_Environ_Our_Wealth .pdf.

20. *Id.* at 323.

21. The International Union for Conservation of Nature and Natural Resources (IUCN) passed a resolution calling for the moratorium on environmental releases of GMOs at the third IUCN World Conservation Congress in Bangkok, Thailand. *Id.* at

While the preamble to the CPB acknowledges "modern biotechnology has great potential for human wellbeing if developed and used with adequate safety measures for the environment and human health," the agreement itself is designed to avoid harm to biodiversity, not to facilitate transfer of technology to developing countries.[22] Article 22 states, "The Parties shall cooperate in the development and/or strengthening of human resources and institutional capacities in biosafety, including biotechnology to the extent that it is required for biosafety, for the purpose of the effective implementation of this Protocol, in developing country Parties."[23]

The Report of the High-Level African Panel on Modern Biotechnology of the AU and the New Partnership for Africa's Development (NEPAD) called attention to the opportunity cost to developing countries posed by focusing on potential risks to the exclusion of benefits:

> Pre-emptive laws that focus on risks can hamper Africa's capacity to harness emerging technologies to meet its needs. Focusing on technological risks can overshadow the possible benefits of an emerging technology, which are often difficult to predict. Strict, risk-focused regulatory regimes may hinder the technology transfer, adoption, development, and potential benefits of emerging biotechnologies. Biosafety policies and laws need to be harmonized using national practices as a basis . . . . *On the whole, adopting laws that pre-empt* technological opportunities should be pursued with caution.[24]

2. Raising the Regulatory Bar: Science-Based Decision Making Versus the Precautionary Principle

The CPB draws on the "precautionary principle" as the basis for regulating the movement of LMOs. The precautionary principle is referenced in a number of multilateral environmental agreements (MEAs), though there is no single definition.[25] However, the CPB has

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320. With the exception of Japan, the Netherlands, and Sweden, most IUCN state-members sponsored. *Id.*

22. CPB, *supra* note 3, pmbl.

23. *Id.* art. 22.

24. African Union, *Draft Report of the High-Level African Panel on Modern Biotechnology of the African Union (AU) and the New Partnership for Africa's Development (NEPAD)*, at 53 (July 14, 2006), *available at* http://www.nepadst.org/sanbio/pdfs/abp_july2006.pdf [hereinafter AU Biotechnology Report] (emphasis added).

25. There are two commonly used definitions. The first is found in the *Bergen Ministerial Declaration on Sustainable Development*:

> In order to achieve sustainable development, policies must be based on the *precautionary principle.* Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

a much lower threshold for taking action than suggested by most definitions of the precautionary principle. The CPB states that precaution may be justified when there are "potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity."[26] By setting a low threshold for action, the agreement increases the regulatory burden on those countries that wish to have access to the technology.

According to a report of the United Nations University Institute of Advanced Studies (UN-IAS), "Predictable regulatory frameworks that encourage technological innovation and facilitate international trade are important components of economic development, particularly for developing countries."[27] The lack of a single agreed definition of the precautionary principle in MEAs or in domestic law creates the potential for abuse of the principle for protectionist ends.[28] Furthermore, strict application of the principle, even with the best of intentions, can lead to hardship among developing countries. The UN-IAS report makes this point: "While many developing countries support the precautionary principle in MEAs as well as in domestic policymaking, the application of the principle can have negative consequences for these countries."[29]

There is no disagreement among the international community about the need to regulate biotechnology at some level, as with any new technology. However, the UN-IAS report points out that "[t]he exact level of caution and the specific procedural, administrative and legal consequences flowing from different standards is the subject of intense debate, political activity and legal dispute."[30]

U.N. Conference on Environment and Development, May 8–16, 1990, *Bergen Ministerial Declaration on Sustainable Development in the ECE Region*, ¶ 7, U.N. Doc. A/CONF.151/PC/10 (Aug. 6, 1990), *reprinted in* [1990] 1 Y.B. Int'l Envtl. L. 429, 431. The second is found in Principle 15 of the *Rio Declaration on Environment and Development*:

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

U.N. Conference on Environment and Development, June 3–14, 1992, *Rio Declaration on Environment and Development*, at 6, U.N. Doc. A/CONF.151/26/Rev.1 (Jan. 1, 1993).

26. SABRINA SHAW & RISA SCHWARTZ, TRADING PRECAUTION: THE PRECAUTIONARY PRINCIPLE AND THE WTO 4 (UNU-IAS 2005).

27. *Id.* at 2.

28. *See id.* (linking a misunderstanding of the precautionary principle with protectionism).

29. *Id.* at 1.

30. *Id.*

II. ONE SIZE DOES NOT FIT ALL WHEN IT COMES TO REGULATIONS

Developing countries do not face the same choices as the developed world. On one hand, developing countries are home to great biodiversity and need to protect this natural resource for future generations.[31] On the other hand, developing countries are faced with great hunger and malnutrition and must take action to increase agricultural productivity simply to keep up with growing populations, particularly in sub-Saharan Africa.[32] Consequently, developing countries have the most to gain from strong regulatory systems that protect biodiversity and the most to lose from overly burdensome regulations that keep new technologies from reaching farmers.

According to the AU-NEPAD Report, "The evolution of regulatory systems has been largely influenced by international debates that are often not directly associated with the technological needs of the continent."[33] The UN-IAS report went even further, stating:

> From an exporting perspective, precaution is certainly an issue of relevance for developing countries for whom the economic costs of applying the precautionary principle are a genuine concern. Developing countries fear the potential impacts on trade from precautionary measures in developed countries, which may be disguised protectionist trade measures that negatively impact their exports. Concerns also have been expressed by developing countries that the application of precautionary measures, which are not sufficiently supported by scientific evidence, threaten economic interests, distort trade, increase transaction costs and divert resources from addressing the environmental issues at stake.[34]

As efforts continue to reinvigorate the Doha Round of negotiations within the WTO, the real possibility of lower agricultural tariffs and subsidies in developed countries exists.[35] There are differences of opinion as to how much this will benefit developing countries.[36] There are likely to be some winners and some losers as countries adjust to the new trade regime, just as there were at the end of the textile quota system last year.

One likely outcome of any trade deal in the WTO—in the absence of tariffs, export subsidies, and trade-distorting domestic supports—is that countries will seek new ways to protect domestic agricultural

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31. Thomas A. Kursar et al., *Securing Economic Benefits and Promoting Conservation through Bioprospecting*, 58 BIOSCIENCE 1005, 1005 (Dec. 1, 2006).

32. John W. Mellor, *The Right to Food: Action to Address the Hunger Problem: The Policy Variables Needed to Address the Hunger Problem*, 30 HOW. L.J. 269, 272 (1994).

33. AU Biotechnology Report, *supra* note 24, at 4.

34. SHAW & SCHWARTZ, *supra* note 26, at 10.

35. Susan Schwab, *USTR Schwab Reaffirms U.S. Commitment to Successful Trade Talks*, WALL ST. J., June 29, 2006, at A14.

36. *Id.*

products. One important method that will remain available to them will be enhancing sanitary and phytosanitary requirements.[37] If countries succeed in inserting the precautionary principle into this trade agreement, the burden of proof will shift from governments establishing the measure to those seeking access to the markets.

While each government has a right under the WTO to set its own level of protection for food safety,[38] the requirement that they be able to provide a science-based justification for their measures is very much in the interest of developing countries.

Developing countries are becoming aware of the limitations of the one-size-fits-all approach to regulations—at least when developed countries define the size. The place where the size of regulations has traditionally been defined internationally for food safety is the Codex Alimentarius Commission.[39]

The role of developing countries in the CAC has historically been one of accepting international standards and incorporating them into domestic regulations, either wholesale or by reference.[40] More recently, developing countries have become aware of the importance of providing input into the development of the standards so that they better reflect their own needs.[41] Given the number of developing countries in the CAC, they have a tremendous capability to shape the decisions of the organization. These countries are just beginning to exert their influence in this international body.[42]

The African Union has identified several pillars of strategic action necessary to ensure economic progress for member countries.[43] Given that the list includes science and technological development

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37. "Sanitary and phytosanitary requirements include, inter alia, regulations intended to protect human or animal life or health in a government's territory from risks arising from the presence of a contaminant or toxin in a food or beverage." Pep Fuller & Thomas O. McGarity, *Beyond the Dirty Dozen: The Bush Administration's Cautious Approach to Listing New Persistent Organic Pollutants and the Future of the Stockholm Convention*, 28 WM. & MARY ENVTL. L. & POL'Y REV. 1, 20 n.117 (2003).

38. Agreement on the Application of Sanitary and Phytosanitary Measures arts. 2.1, 5.1, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, Legal Instruments—Results of the Uruguay Round, 33 I.L.M. 1125 (1994).

39. Lawrence O. Gostin, *Pandemic Influenza: Public Health Preparedness for the Next Global Health Emergency*, 32 J.L. MED. & ETHICS 565, 566 (2004).

40. Marsha A. Echols, *Focus on Biodiversity for Food Security: Expressing the Value of Agrodiversity and Its Know-How in International Sales*, 48 HOW. L.J. 431, 442 (2004).

41. *See* Jose E. Alvarez, *The New Dispute Settlers: (Half) Truths and Consequences*, 38 TEX. INT'L L.J. 405, 425 (2003) (observing that developing countries are now complaining that the international standards are insufficiently flexible to accommodate both rich and poor nations).

42. China recently flexed its muscles in the CAC by taking over the chairmanship of two committees at the Commission meeting in Geneva in July 2006. *Food Safety: Commission Adopts New Standards on the Maximum Allowable Levels of Contaminants and Food Additives*, 2006 SCI. LETTER 643, 643.

43. *African Common Position*, *supra* note 1, at 105.

and the removal of trade barriers, the international bodies in which these issues intersect become even more critical.[44]

III. CONCLUSION

There is a push by some countries, including those in Europe, to incorporate the precautionary principle into the jurisprudence of the WTO. The most recent attempt occurred in the *EC-Biotech* case decided last year.[45] However, in a world in which the days are numbered for traditional trade barriers, such as tariffs and subsidies, there will be increased pressure for countries to take advantage of the SPS Agreement for protectionist ends. This may not be the best time to weaken the standards for scientific evidence necessary to support measures under that agreement.

As lawyers go about drafting international agreements and balancing the benefits of new technologies with the risks to people and to the environment, they should remember that there is not a single "right" balance between scientific progress and environmental protection for all people in all places at all times. What constitutes a serious threat in one country may be a mere nuisance in another. An action that is cost-effective for one country may be cost prohibitive for another. The AU-NEPAD report states: "Emphasis should be put on maximizing the [benefits] associated with new technologies while reducing their negative impacts. Equally important is a consideration of the long-term implications of non-adoption of emerging technologies."[46]

Given the different purposes of the international agreements that impact science and technology in the developing world, it should be no surprise that some of them have contributed to increased agricultural productivity while others have made that goal more difficult to achieve. By recognizing that agreements related to biosafety and sustainable development may have impacts beyond their stated objectives, the lawyers drafting them can ensure that a wider range of interests are considered, and that the final agreements better reflect the economic and social status of all the parties.

So, how many lawyers does it take to feed a village? All of them—working together.

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44. *Id.*

45. Panel Report, *European Communities—Measures Affecting the Approval and Marketing of Biotech Products*, WT/DS291/R, WT/DS292/R, WT, DS293/R (Sept. 29, 2006), *available at* http://www.wto.org/english/news_e/news06_e/291r_e.htm.

46. AU Biotechnology Report, *supra* note 24, at 4.