

Of Plant Variety Protection, Agricultural Subsidies, and the WTO

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The World Trade Organization (WTO) representing the institutional evolution of the General Agreement on Tariffs and Trade (GATT) was established to fulfill its predecessor's failed objectives of curtailing barriers to international trade.¹ The WTO's predecessor, GATT, came into existence in 1947, when twenty-three nations agreed to "start an international organization to promote trade and arbitrate disputes."² In 1947, however, the needs of poor countries mattered little.³ Industrialized nations were rebuilding after World War II, and they "remained the economic masters of Asia, Africa, and Latin America."⁴

The 1993 Uruguay Round, which created the WTO, differed from GATT by promoting global inclusiveness and by promising "differential treatment" to developing nations commensurate with their levels of development.⁵ Similarly, the WTO's involvement in global trade extended to areas excluded by GATT, including investment, agriculture, textiles, intellectual property rights, and services. Furthermore, GATT's reincarnation as the WTO was fortified by the inclusion of an enforcement mechanism to help achieve the objectives of reducing barriers to international trade.⁶

International trade barriers are essentially national actions or inactions that create a distortion in the international trade in goods or services. Trade is distorted if prices are higher or lower than normal; if quantities produced, bought, and sold are also higher or lower than the levels that would usually exist in a competitive

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market.⁷ Every distortion carries global ramifications, but poorer nations are particularly affected from barriers that relate to agricultural trade. Broadly, barriers to trade in agricultural commodities originate from two issues: (1) agricultural subsidies and (2) lack of plant variety protection (PVP).

Subsidies are measures taken by national governments to protect local farmers from market forces or to ensure abundant availability of food. These seemingly local protective measures affect the trade of other nations by artificially interfering with the global market. The Agreement on Agriculture,⁸ along with the Agreement on Subsidies and Countervailing Measures,⁹ signed as part of the Uruguay negotiations, address the issue of reduction of barriers to agricultural trade from subsidies. Of all the WTO obligations, reducing barriers to agricultural trade by addressing state subsidies is unique in requiring substantial efforts from the developed world.¹⁰ While imposing requirements upon developed nations, reducing barriers to agricultural trade is distinguished in its ability to produce immediately perceivable benefits to poorer nations.¹¹ Hence, the outcome of the issue of agricultural subsidies reflects the WTO's ability to shepherd the powerful members among its ranks to fulfill their trade commitments.

The issue of protection of plant varieties generally mirrors the debate on trade barriers created from the lack of intellectual property rights—that is, the lack of intellectual property protection for innovations in plant breeding results in depriving the property holder of rightful royalties to which they would be entitled to otherwise. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), signed in 1994 as part of the agreements to be administered by the WTO, addresses the wider issue of reduction of barriers to international trade from lack of intellectual property protection.¹² As part of that wider system, the TRIPS Agreement embodies provisions for protection of plants varieties.

While PVP relates directly to the question of intellectual property protection over innovations in plants, the issue of agricultural subsidies, while lacking such a relation, bears critical relevance to the ability of nations to derive benefits from the introduction of an intellectual property regime. Thus, introducing plant-breeding rights (PBRs) provides only one facet of the analysis concerning the reduction of distortions to trade. But the discussion of intellectual property rights per se remains futile if divorced from the realities of the marketplace, which ultimately dictate the feasibility of the PVP regime.

While negotiations at the WTO have dealt with each of these issues individually, members cannot afford to ignore the combined effect of these policies on their agricultural trade. Thus, instead of dealing with intellectual property rights in exclusion, this chapter discusses how the WTO agreements work in tandem on trade relating to agricultural commodities. It highlights the interplay between intellectual property rights and other forces that affect the fulfillment of the proposed benefits from introducing such rights.

The chapter begins by discussing the WTO provisions relating to each of the agricultural trade barriers. It uses the subsidies issue to provide a contextual understanding of the larger market as it relates to international agricultural trade. It then outlines the concerns arising from a lack of PBRs, followed by an analysis

of the interaction between these two barriers on agricultural trade. In doing so, the chapter seeks to measure the WTO's ability to accomplish its objective of working toward the benefits of developing countries by using the narrow yardstick of how the organization handles issues relating to barriers that affect trade in agriculture.

AGRICULTURAL SUBSIDIES

Subsidies as a Trade Barrier

Government restrictions on international trade are imposed as taxes, duties, or subsidies. The word subsidy, in the agricultural context, encompasses any financial benefit that supports the income of farmers or the price of agricultural goods. Subsidies can be made either as a financial allocation by a government directly, or they may be allotted indirectly by any public body—whether they are transferred directly or through programs such as grants, loans, equity infusion, or loan and other guarantees that promise a financial benefit.¹³ Alternately, subsidies can be a financial benefit conferred either by writing off a debt, including tax credits, or by providing infrastructure and other indirect benefits.¹⁴ Thus, the term subsidy refers to any financial support that a government provides to offset or balance the losses that farmers and traders may suffer in the market of agricultural commodities.

In effect, subsidies mitigate or offset losses by supporting either the income of farmers or the price of the commodities they produce. For example, the Government of Timbatu may agree to subsidize individual rice farmers up to a minimum income of \$5,000 per annum for the sale of rice. The government subsidy compensates the difference between expected income of \$5,000 and the actual income that the farmer earns. Therefore, a farmer earning \$1,000 will be eligible for a subsidy of \$4,000 from the government. In the alternative, government subsidies may support shortfalls in commodity prices. If, for example, the Timbatu Government above subsidizes rice farmers up to \$5 per unit, the subsidy compensates the difference between the actual sale price per unit and the expected sale price of \$5. If the farmer sells rice at \$1 per unit, then the government will compensate the farmer with \$4 for each unit sold. In the same manner, the government may also pay the farmer \$5 for each unit of unsold rice. Similarly, governments may also specifically limit subsidies to designated geographic regions. Although all support programs work on the basic principle of insulating farmers from the risks of the market, the commonly found trade distorting subsidies are typically more sophisticated than the examples above. Such subsidies are fashioned in the form of government crop insurance, tax credits to promote the export of specific commodities, incentives to encourage the cultivation of specific crops, or loan guarantees to offset profits from lack of sales. Some governments may provide subsidies in the form of fiscal incentives like tax credits, or they may be allotted as goods and services other than general infrastructure.

The cushioning effect of agricultural subsidies induces farmers to produce the subsidized commodity, thereby leading to overproduction. The surplus from the excess production consequently drives down the general market price. Thus, by largely eliminating the risks from the market by ensuring a certain percentage of returns to the farmers, subsidies cause trade barriers. First, subsidies of an exporting country hurt the domestic industry of the importing country.¹⁵ As an illustration, suppose Timbatu, a country where the cost of production of wheat is a high \$8 per unit, compensates its wheat exporters up to \$5 per unit of wheat sold. Timbatu exports wheat to Utopia, where owing to the cost of production, farmers cannot break even unless they sell wheat at \$4 per unit cost. Timbatu's farmers and exporters can price their wheat anywhere between \$3 and \$3.99 per unit and still profit from Utopia's market despite cost of production being higher in Timbatu. Understandably, consumers in Utopia would prefer the imported wheat available at lower cost. Timbatu's artificially lowered prices thereby unfairly affect the sales of Utopia's farmers, even though the cost of production is lower in Utopia.

Second, subsidies affect the ability of rival exporters from nonsubsidizing countries to compete in other markets.¹⁶ In the example above, farmers from Pragnolia, a wheat exporting country that does not offer subsidies, cannot import to Utopia unless their cost of production is around \$3 or less. Even if the fair international price of wheat per unit is \$6, given the government's direct subsidy program, farmers from Timbatu can export wheat at a price of less than \$6 per unit (for as low as \$3 per unit) to create an artificial demand for their wheat. The immediate effect of such artificial price reduction will be felt by farmers from countries like Pragnolia intending to export to a country that imports from Timbatu. Notably, Pragnolia is prevented from competing fairly in the international market because its wheat, even if fairly priced, will be expensive both in Utopia's market and in the international market. In fact, Pragnolia's local market can also be flooded with the low-priced Timbatu wheat, thus displacing its farmers from wheat production. Pragnolia's economy, if dependent on wheat exports, would suffer because of Timbatu's subsidies. Hence, Timbatu's subsidies prevent farmers in other nations from fairly accessing the market without sustaining a loss until their own nations are able to match the artificially lowered prices. The only way Pragnolia's farmers can compete with Timbatu's farmers is if the Pragnolian government matches the Timbatu subsidies, thus starting a vicious cycle.

The consequence of the resulting cycle is that: On the one hand, the lowered cost of Timbatu wheat creates an artificial demand in the international market, which forces other producers to bring down their price either by seeking national subsidies or by selling at a loss. On the other hand, the subsidies, by insulating farmers from the risks of the market, gradually encourage overproduction of wheat in Timbatu. Excess supply of wheat in the international market drives the prices down further, affecting overall agricultural trade in the commodity. In order to remain competitive in the international market, in the example above, Timbatu's farmers must further reduce the price of wheat, and in turn, seek greater export

subsidies. Consequently, as prices decline, subsidizing governments are forced not only to maintain but to increase their rate of subsidies. Slowly, the decline of prices in the export market results in subsidies generating the third important barrier to trade by causing the international price of the commodity to plunge below local market price. Related to the example above, subsidies will ultimately cause the export price of Timbatu wheat per unit to be lower than the price of the same quantity of wheat in the local Timbatu market.

Subsidy Leading to Dumping

When a product's export price is below the sale price of the commodity in the national market, the seller is said to have dumped the product.¹⁷ That is, when the unit price of wheat in Timbatu, at \$10 locally, is more than the price in the rest of the world, Timbatu's farmers have dumped their goods in the export market. Government export subsidies inevitably cause sellers from the subsidizing nations to dump their goods in other countries. A market where overproduction results in excess supply leads to farmers or exporters selling at a lowered price in the international market to seek compensation from the export subsidies. Since the cost of the dumped goods is lower than the fair market price, dumping directly affects traders of the same commodity in the nonsubsidizing countries that are unable to match the subsidies. The artificially lowered prices distort domestic and world prices of that commodity, and affect farmers and traders of the commodity on a global scale. In the example above, the wheat dumped by Timbatu's farmers affect the marketability of the native wheat. That is, when Timbatu farmers sell their commodities at a lower price in the international market, other countries procure these commodities for their local use. Less expensive foreign wheat floods the markets of wheat importers like Utopia and other wheat producers like Pragnolia because it is cheaper than their own domestic wheat. Thus, dumping directly affects the livelihood of farmers, which in turn affects the economies of agrarian countries (nations with economies predominantly dependant on agriculture) where farmers comprise a sizable section of the population.

The drastic consequences of the national export subsidies of a country are felt by unrelated agrarian economies that are unable to match the incentives doled out by the subsidizing nations. Agrarian economies suffer because of the inability of farmers to make the expected returns despite the fact that consumers may benefit from the lowered prices. Fundamentally, dumping forecloses access to local as well as export markets for farmers in developing countries.¹⁸ Further, in driving developing country farmers out of their local markets, dumping shrinks the rural economy.¹⁹ A study by the Institute for Agriculture and Trade Policy reports widespread dumping by developed nations. For example, in 2003, the study outlines that wheat from the United States was exported at 28 percent below cost of production, soybean at 10 percent below cost of production, cotton at 47 percent below cost of production and rice at 26 percent below cost of production.²⁰

Unfortunately, since dumping is the consequence of the actions of individual actors, including farm producers and corporations, rather than governments themselves, the WTO's authority to regulate is minimal. The WTO deals with governments, and therefore, the only way the WTO can deal with dumping is by requiring the subsidizing country to reduce or eliminate the subsidy, provided the complaining country can prove injury or serious prejudice to its economy. Even though the burden may be high, this possibility of relief from dumping resulting from subsidies is paramount. Indeed, even those economists who argue that consumers in poorer countries benefit from dumped goods still conclude that subsidies are innately harmful.²¹

Assuming *arguendo* that the WTO may at some point deal effectively with agricultural subsidies and dumping, the organization still lacks the vision to manage the consequences that food importers will face. That is, when subsidies are actually lowered or dumping reduced, the prices of commodities that were previously dumped would raise affecting consumers in some food importing nations. Even countries that will benefit as food exporters may face short term increase in prices as they switch to becoming a food exporter.²² As many as forty-five least developed countries (LDCs), out of forty-nine, are net food importers, and as many as thirty-three LDCs are net importers of all agricultural products together.²³ While it is unfortunate that the WTO has been unable to effectively reduce subsidies, the greater tragedy is that the institution lacks a viable plan to help nations from the immediate after effects of reduction of subsidies for food importing nations. The only effort so far to address the issue is a special Ministerial Declaration setting out objectives and measures for the provision of food aid for agricultural development in import dependent countries.²⁴ The Declaration seeks to establish a "Committee on Food Aid" to initiate "negotiations to establish a level of food aid commitments sufficient to meet the legitimate needs of developing countries during the reform program," and to solicit developed country members to provide technical and financial assistance.²⁵ Additionally, the Declaration looks to the possibility of assistance from the International Monetary Fund and the World Bank to finance commercial food imports. At the core, the proposed solutions lack concomitant obligations, with the possibility of success dependent entirely upon either the negotiating skills of nations with the least bargaining power or, on the benevolence of richer nations.²⁶

The WTO lacks a long-term vision to cope with the food security issues of poorer nations because it harbors the institutional belief that its objectives of lowering trade barriers would be achieved in the unlikely event that subsidies are reduced. Other than offering possible solution options in the Ministerial Declaration, the WTO leaves the governments of the least developed countries to handle the actual security of their food supplies. While economists like Jagdish Bhagwati dismiss the matter on the grounds that poor nations are paying the price for decades of "not [being] interested in agricultural development,"²⁷ others, like Devinder Sharma, point out that "[g]ood economics would surely aim at pulling these countries out," rather than merely placing the blame on them.²⁸ Despite

the significance of the immediate consequences of reduction of subsidies on food importing nations, the issue is only one facet of the larger question of how the WTO will achieve its objectives in dealing with agricultural subsidies.

The Agreement on Subsidies and Countervailing Measures

Two agreements, the Agreement on Subsidies and Countervailing Measures (SCM Agreement)²⁹ and the Agreement on Agriculture (AOA),³⁰ were negotiated at the 1994 Uruguay Round with the understanding that a reduction of trade barriers in agricultural commodities will improve the economies of developing nations. The SCM Agreement deals with the spectrumwide issue of subsidies and counteractions to them in all areas of trade, including agriculture.³¹ The AOA deals specifically with support programs and subsidies for agricultural commodities.³²

The SCM Agreement was negotiated to streamline subsidies and other support systems across all areas of trade, and to regulate national counteractions against subsidies.³³ The Agreement states that subsidies which are specific to certain enterprises, and which operate to the exclusion of others, cause barriers to international trade.³⁴ These specific subsidies are classified by the agreement as nonactionable, actionable, and prohibited.

Nonactionable subsidies are those that are not specific, or when specific, are meant for purposes like research related activities.³⁵ Prohibited subsidies are those that are contingent upon either export performance or the use of domestic products over imported goods.³⁶ Such subsidies are prohibited by the SCM Agreement because they are specifically designed to distort international trade, and as a consequence, are likely to hurt the trade of other countries.³⁷ Subsidies with the potential to injure or seriously prejudice the domestic industry of another WTO member or affect the benefits accruing to other members are termed as “actionable.”³⁸ Actionable subsidies are not explicitly prohibited, but instead, are subject to permissible countervailing actions by the affected country.³⁹ Alternately, the affected members can use the WTO dispute settlement process to seek “withdrawal of the subsidy or the removal of its adverse effects” through the WTO dispute settlement process.⁴⁰ In order for action to be taken either by the complaining member or the WTO itself, the affected country must conduct its own investigation and prove that the subsidy has caused serious prejudice to its interests.⁴¹ Such prejudice can be proven by showing evidence of injury to a domestic industry, adverse effects on local or international markets, or nullification or impairment of expected benefits from the trading system.⁴²

Agreement on Agriculture

Agricultural subsidies are also subject to the terms of the AOA. Negotiated under the auspices of the WTO, the objective of the AOA is to “establish a fair and market-oriented agricultural trading system.”⁴³ Reducing agricultural support

protections was the chosen method to establish such a fair trading system.⁴⁴ In doing so, WTO members specifically agreed to take into account the “needs and conditions of developing country [m]embers” to structure an equitable reform programme “having regard to non-trade concerns, including food security and the need to protect the environment; having regard to the agreement that special and differential treatment for developing countries is an integral element of the negotiations.”⁴⁵ In annex 1 of the AOA, the Agreement discusses the measure of annual support that each member can provide for specific products.⁴⁶ Essentially, the Agreement outlines the extent of concessions, the commitments of members to reduce or streamline agricultural support programs for domestic and export markets, and the concessions geared toward enabling market access.⁴⁷

The AOA divides domestic support programs into three categories. “Green box” programs are the equivalent of the nonactionable subsidies,⁴⁸ and consist of programs that serve national objectives without distorting international trade.⁴⁹ Listed in annex 2 of the AOA, the nonactionable green box programs include those that cater to food aid, decoupled payments (payments that are not linked to production commitments), measures to improve research, quality, and inspection of food, general infrastructure allotments, rural development plans, programs for promoting the environment, and campaigns that foster regional assistance.⁵⁰ Both developing and developed nations can take advantage of the green box programs.⁵¹

Following green box programs are “blue box” subsidies, which include production-limiting programs. Blue box subsidies also encompass developmental measures in poorer countries and *de minimis* support programs that are exempt from reduction commitments under article 6 of the AOA.⁵² *De minimis* support programs are those where the support for the product does not exceed 5 percent of the total value of production for developed and 10 percent for developing nations.⁵³

Lastly, the trade distorting subsidies subject to reduction commitments are the “amber box” programs. Export subsidies, product-specific subsidies provided for producers of basic agricultural product, and non-product-specific support provided in favor of agricultural producers in general fall within this category if they do not qualify under the guidelines of the green or blue box programs.⁵⁴ WTO members employing nonexempt subsidies become subject to a maximum level beyond which these support programs cannot exceed. Subsidies that exceed maximum allowable levels become known as “red box,” or forbidden programs. Developed country members utilizing amber box subsidies agreed to reduce their base period support by 21 percent over six years, while developing country members pledged to reduce their use by 13 percent over ten years.⁵⁵

Due Restraint and Peace Clause

The highlight of the AOA, termed the “peace clause,” set out to “reduce the likelihood of disputes or challenges on agricultural subsidies over a period of nine

years.”⁵⁶ Detailed under article 13 of the AOA, the peace clause advocates due restraint during the implementation period, which extends to nine years from 1995.⁵⁷

The peace clause protects green box subsidies fully. Specifically, the clause provides that during the implementation period, green box domestic support measures cannot be subject to any countervailing action or other subsidy action under the SCM Agreement, nor can actions based on nonviolating nullification or impairment of tariff concessions be undertaken under the GATT.⁵⁸ Similarly, members are advised to show due restraint against initiating a countervailing duty investigation, beginning a nonviolation nullification, or impairing blue box domestic support measures. Moreover, subsidies supporting specific commodities are exempt from countervailing duty investigation by virtue of the peace clause, provided that the extent of support does not exceed 1992 levels.⁵⁹ WTO members are also required to exercise due restraint in bringing any countervailing measures investigation against export subsidies falling within either the prohibited red box category or the actionable blue box subsidies.⁶⁰ As long as the domestic red and blue box subsidies provided to individual products does not exceed the support levels provided in 1992, these measures are exempt from other subsidy action, nullification, or impairment action.⁶¹ Article 13 of the AOA, by protecting the subsidizing members against any actions by the affected countries, legitimizes support programs otherwise prohibited under the SCM Agreement for a period of nine years.⁶²

The peace clause expired at the end of 2004. With the expiration of the peace clause, countries had to negotiate toward fulfilling their commitments to reduce agricultural subsidies. Although the first set of negotiation modalities for a phased reduction of subsidies began in 2000, to date, no consensus in implementation has been reached, largely because richer nations, fearing political consequences, have refused to agree to any meaningful reductions in commitments. Members had a stalemate at the Fifth WTO Ministerial Conference in Cancun in 2003, where developing countries refused to move further unless the agriculture issue is resolved.⁶³ Even so, the WTO members returned for negotiations at the Sixth Ministerial Conference in Hong Kong, and decided to agree on modalities with respect to indirect subsidies like export credit guarantees by April 2006,⁶⁴ which is now yet another deadline that has passed without any commitments from the developed nations.

Developed nations want the developing nations to take the first step in reducing subsidies, while developing nations feel that they have already exhibited their commitment to the WTO by introducing TRIPS related measures. Meanwhile, developed nations continue to heavily subsidize agriculture to the detriment of the farmers of the developing nations. Developed nations, including the United States, spend an estimated \$300 billion per annum in subsidies.⁶⁵ The total amount of agricultural subsidies in developed countries represents approximately the gross national product of all of sub-Saharan Africa,⁶⁶ or six times the current annual level of development assistance that developed nations

provide to poor countries.⁶⁷ Developed nation subsidies affect \$40 billion worth of net agricultural exports per annum from developing countries.⁶⁸ In 1997, the loss to developing countries from agricultural subsidies of the developed nations amounted to \$24 billion.⁶⁹ Annually, Latin America and the Caribbean alone lose \$8.3 billion from loss of agricultural trade.⁷⁰ Asia's loss per annum is estimated at \$6.6 billion, and sub-Saharan Africa's at \$2 billion.⁷¹

Elimination of the subsidies of developed nations would triple net agricultural trade in developing countries. The estimated gain to all countries, both developed and developing, would be approximately \$100 billion if subsidies and tariffs in developed countries were eliminated.⁷² Furthermore, poorer nations, which typically borrow from institutions like the World Bank, are encouraged to eliminate subsidies as a precondition to release of funds. For example, India has reduced its subsidies to an annual sum of \$1 billion for its 110 million landholders, equivalent to just \$9 per year per farm.⁷³ International institutions, however, lack the influence in developed nations to compel similar or corresponding measures.⁷⁴ Thus, the United States and the European Union have, during the same period, managed to either maintain or increase their level of subsidies, thereby adding to the distortion in the international market.⁷⁵

Meanwhile, as nations stand off on the issue, dumping directly resulting from the subsidies of richer nations continues to devastate poorer nations. For example, Oxfam reports that EU subsidies have caused a decline in world sugar prices by 17 percent, which disproportionately affects smaller nations like Mozambique that would otherwise have benefited from the export revenues.⁷⁶ India, the world's largest dairy producer, does not benefit proportionally from its dairy production, since the EU subsidizes up to 60 percent of the world market price for whole milk powder and 136 percent of the international price of butter.⁷⁷

The TRIPS Effect

In stark contrast to this background of broken timetables, the WTO has largely been successful in implementing the TRIPS requirements. Considering that the TRIPS provisions largely benefited developed nations, the due restraint advocated in article 13 of the AOA⁷⁸ per se sounds lame, and serves to corrode the legitimacy and impartiality of the WTO process.⁷⁹ Theoretically, the implementation period under the AOA for developed nations was six years from 1995, while developing nations had an additional four years to reduce support programs.⁸⁰

Practically, however, developed nations were protected against any actions for a period of nine years by virtue of the peace clause, which essentially meant that the avowed objective of providing special treatment to developing nations was a mere one year. Thus, article 13 of the AOA stands as a reflection of the utter inability and impotence of the WTO system to treat parties in a manner that fairly accounts for the levels of economic development. The developed nations' annual subsidies of \$300 billion typify the grossly imbalanced international trade in agricultural commodities.⁸¹ Even as the WTO website touts the benefits of

eliminating subsidies in developing countries, the organization ignores inconvenient truths about the global market, including the fact that poorer economies will accrue the most benefits if developed nations streamline their subsidies.⁸² Unfortunately, it is this inability to deal with the entrenched economies of powerful countries that has resulted in lingering questions about the capability of the WTO to reduce trade barriers fairly.

Other issues also have a bearing on how subsidies affect poorer nations. Most developing nations have transitioned and moved to a patent system after the end of 2005.⁸³ The biggest impact of the transition is that developing countries will be unable to manufacture low-cost generic versions of patented pharmaceuticals. The cost of what is considered a cheap medication in the West is higher than the per capita income in most developing nations and well over the per capita income in any of the least developed nations.⁸⁴ Consequently, developing countries either have to declare several diseases as triggering a national emergency under the Doha Declaration, which in turn could lead to the WTO dispute settlement process, or they must find funding to create access to medication.⁸⁵

Ugandan President Yoweri Museveni captured the frustration of developing nations poignantly when he declared, “if there were no agricultural subsidies [in America and Europe] we would earn enough money to buy all the drugs we want.”⁸⁶ One way to create more income earning capacity in developing countries is to liberalize farm trading, which would benefit huge numbers of farmers in these nations, where large populations are dependant on agriculture.

Meanwhile, as part of adopting TRIPS, most nations have also adopted “plant breeder’s rights” at the end of 2005.⁸⁷ Introducing intellectual property rights in plants creates an opportunity to improve production by procuring hybrid varieties. While hybrid varieties are subject to the monopoly privilege of intellectual property rights, the provisions for plant variety protection were introduced with the understanding that hybrids could result in higher yields. Nevertheless, if markets remain distorted by agricultural subsidies, even with higher yields, developing nations will still be dumped out of international and national markets. Thus, freeing the trade barriers in agriculture could go a long way in restoring the credibility of the WTO as a fair and equitable forum.

PLANT VARIETY PROTECTION

Plant variety protection is the process of recognizing innovations in plant breeding by vesting monopoly rights on the plant breeder. The Wikipedia defines plant breeding as the “purposeful manipulation of plant species in order to create desired genotypes (genetic makeup) and phenotypes (structure and constitution) by different scientific processes.”⁸⁸ Plant breeding per se is akin to the process of evolution, wherein human beings have experimented for centuries to produce plants with traits that best serve human needs.⁸⁹ In modern times, plant breeding is practiced with specific objectives of either introducing or eliminating traits

that increase resistance to weather, pests, and which improve productivity of the resulting hybrid.

The hybrids' ability to eliminate traditional deficiencies in agriculture reduces unpredictability in farming. Farmers benefit from the increased yield of the improved varieties, while consumers benefit from the resulting diversity of plant breeds. The immense advantages of hybrids, both in terms of marketability and predictability of the yield, bear the greatest promise of eradicating global food insecurity. Viewed in the context of the developing world's lack of access to sufficient food, the hybrids could potentially serve to alleviate hunger by increasing food production.⁹⁰ Despite these benefits, the introduction of PBRs was one of the most contentious issues of the Uruguay negotiations. The following Section highlights the ramification surrounding the issue of PBRs and views it in the context of barriers from agricultural subsidies.

History of Plant Breeding

Historically, the idea of plant breeders' rights was conceived and furthered by the industry in the early 1900s.⁹¹ The first known bill to protect breeders' rights was introduced in the United States in 1904.⁹² Similarly, there was an attempt in 1911 to introduce plant variety protection in France, but the attempt failed.⁹³

During that time, in 1919, the United Kingdom's Patents and Designs Amendment Act reflected the general sentiment in Europe of restricting patentability of substances relating to food.⁹⁴ The Sargent Committee Report explained the reasons for restricting patenting of food substances by stating:⁹⁵

[D]uring the war it became apparent that Great Britain was suffering from a lack of medicine and drugs, many of which were the subject of patent rights in this country. On the other hand, it was found that in many European countries (e.g., France, Germany and Switzerland) such substances were not capable of protection under the patent laws of those countries. In this state of things it was considered expedient to modify to some extent the monopoly consequent on the existence of patent rights in regard to such substances.⁹⁶

Although the term "such substances" above refers to patents on drugs and medications, several European countries shared the underlying logic of this sentiment, and expanded the restrictions on protecting food related innovations by product patents.⁹⁷ Similar objections prevailed against protection of plant varieties to prevent monopolization over food.⁹⁸

It is likely that the plant breeding industry found the fear over food scarcity to be the appropriate juncture to lobby for more market power.⁹⁹ These efforts led to the establishment of several private seed research and testing stations.¹⁰⁰ Consequently, in the 1920s and 1930s, several countries attempted to introduce seed certification systems.¹⁰¹ For instance, Czechoslovakia introduced the Law on Recognition of the Originality of Types, Seeds and Seedlings in 1921.¹⁰² In

1930, Germany introduced the Seed and Seedlings Law,¹⁰³ embodying language closely resembling the 1961 International Union for the Protection of New Varieties of Plants (UPOV) Convention.¹⁰⁴ Although the legislation failed, it laid the foundation for substantial debate in Germany on the issue of plant breeding rights, including protection by patents.¹⁰⁵

At the exact same time, in 1930, the Townsend-Purnell Act (Plant Patent Act) introduced plant breeders' rights in the United States, but it confined protection to asexually reproduced varieties.¹⁰⁶ The legislation, which was extensively used by the American fruit tree breeders, set the platform for further protection of plant varieties in the United States.¹⁰⁷ In 2000, the Plant Variety Protection Act (PVPA) introduced protection for sexually reproduced plant varieties.¹⁰⁸ In 2001, the U.S. Supreme Court specifically allowed utility patent protection for species protected under the *sui generis* form of PVPA protection.¹⁰⁹ Thus, the United States has remained the forerunner in safeguarding breeders' rights by invoking various forms of protections including by both trade secret law and the law of contracts.¹¹⁰

Over the years, breeders have enjoyed increasing protection for their innovations. During the twenty-year term of protection, breeders enjoy extensive rights, including the right to privileged pricing over the seeds, and the prevention of "brown bagging," or the replanting of protected seeds, which forces farmers to buy the seeds every year. The protection regime has changed the contours of the industry within the developed nations by privatizing agriculture. Furthermore, private investment in agricultural research has even resulted in "seed wars," discussed in depth in Professor Keith Aoki's chapter in the patent volume. As a result, multinational conglomerates, rather than small farmers, dominate the agricultural sector of the developed nations. Therefore, it has been the breeders' lobby that has alerted the developed nations to the trade barriers that arise from lack of plant variety protection in the third world. Breeders allege that when farmers in developing nations infringe upon protected varieties by brown bagging, they deny them the rightful royalties associated with the market.

Concerns of Developing Nations

At Uruguay, the developed nations touted PBRs on the grounds that increased agricultural research can benefit the food shortage issues of developing nations by improving production. In advocating PBRs, the TRIPS objective was to increase innovation in plant breeding through private investments. Developing nations, however, had two major concerns, being the feasibility of a plant protection regime in developing nations, and the corollary effect of a PBR regime on biodiversity protection issues addressed in the Convention on Biological Diversity.¹¹¹

The concern over hastily introducing PBRs was prompted by the reality that the agricultural sector in developing nations operates differently in comparison with the counterpart in developed nations, owing to smaller land holdings and

labor-intensive agricultural practices.¹¹² These distinctions result in the prevalence of subsistence farming over farming for commercial export. Typically, farmers and traders from developing nations are considered to lack the ability to transition into a sophisticated market with players operating at different levels. In lay terms, small farms, minimal profits, and widespread illiteracy constrain these farmers' ability to navigate through the sophisticated licenses that characterize a protected regime.

Unfortunately, these differences in agricultural production result in developing nations facing a host of unique issues. Unlike the developed nations, agricultural output bears a close nexus to the economic conditions in developing nations. Indeed, the majority of the population in poorer countries depends on agriculture. Furthermore, most developing countries already face welfare issues on a scale unknown in the developed world. Thrusting a sophisticated system into this environment could lead to further degradation of the agricultural population. Hence, the potential for destabilization of their economies has rendered poorer nations skeptical about introducing any policy that might adversely affect agriculture.

Regrettably, there are few studies focusing on the effects of PBRs on developing nations. Poorer countries posit that lack of adequate research deprives them of information on the potential impact and socioeconomic effects of privatizing agriculture. Likewise, developing countries emphasize that the lack of specific studies has denied them the benefit of being pro-actively equipped to tackle issues that may result from introducing PBRs. For example, the introduction of the "Green Revolution," a movement to increase the yield per acre of certain crops like rice and wheat, fulfilled the promise of high yielding varieties.¹¹³ It resulted, however, in other social issues for developing nations. Studies conducted after the Green Revolution indicate the prevalence of social issues from landlords deriving more benefits than the peasants.¹¹⁴ Furthermore, small-scale farms suffered a variety of economic and social woes, including lower wages, displacement from the land, loss of employment, and higher rents.¹¹⁵ The studies also discovered a bias in the diffusion of improved varieties, which resulted in huge benefits to the large-scale farmers and meager benefits to the small-scale farmers.¹¹⁶ As a consequence, small-scale farmers received a disproportionately small share of the benefits from the new technology.

The possible negative social connotations of the Green Revolution were unknown prior to its introduction because of the lack of nation-specific studies in the developing world. Generally, the proponents of PBRs assume or assert that developing nations will benefit from their introduction simply because developed nations have benefited. Despite this rhetoric, models that have worked in developed nations do not necessarily enjoy equal success in the vastly different market models of the developing and least developed nations.

Further, developing nations remain unwilling to disrupt programs that provide for innovative plant breeding through government-funded public institutions. Current publicly funded research activities concentrate on staple food

crops, rather than on consumer-oriented research to achieve national goals such as access to food and the eradication of poverty. Private research and development (R&D) investments tend to cater to consumer foods rather than staple foods, because private investors will not benefit from PBRs unless the research is directed toward crops with the greatest profit potential. In addition, developing nations emphasize that private support could unduly influence a public R&D agenda. A shift in the goals of agricultural research may not cater to the welfare necessities of developing nations, even if agricultural production increases. Specifically, public research programs could be disproportionately leveraged toward private industry goals, rather than toward the broader interests of farmers or consumers.¹¹⁷

In any case, developing nations remain skeptical of PBRs' *ability to* singularly result in increased investments in food. Western economic studies, like the Butler and Marion report, concede that the resulting privatization from introducing PBRs cannot singularly trigger an increased R&D investment.¹¹⁸ Other studies have determined that R&D investments in agriculture depend on factors extraneous to breeding, like profitability of crops, market size, and capital intensiveness.¹¹⁹ Independent of other factors like fluctuation of supply and demand (e.g., changing acreage and increasing crop profitability), improvements in breeding techniques, and the use of computer-based systems for information processing and monitoring, studies remain inconclusive as to whether PBRs alone can contribute to agricultural investments.¹²⁰ Developing nations, therefore, underscore that internationally harmonized PBR regimes, if introduced, should incorporate flexibilities to balance local welfare issues.

International Obligations for Plant Variety Protection

In appreciation of the differences of WTO members' opinions on the PBRs issue, article 27(3)(b) of TRIPS states that "members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof."¹²¹ The minimum requirement of the article is for members to effectively protect plant varieties. TRIPS does not set any substantive standards for such protection, but merely requires members to provide any one of the three broad forms of the outlined protections, whether it be patents, a *sui generis* mechanism, or a combination of both patents and the *sui generis* mechanism.¹²² The plant varieties protection provision is unique, considering that TRIPS generally establishes minimum standards of protection. In effect, article 27(3) deviates from the other provisions of TRIPS in not harmonizing the plant variety regime. Harmonization requires a certain degree of uniformity that would be impossible to achieve considering the flexibility fashioned into the article. The flexibility in article 27(3) is meant to accommodate national priorities in protecting plant varieties by allowing members the luxury of determining appropriate national plant variety protection regime.¹²³ Countries that question the assertions of developed nations on the benefits of PBRs, or, alternatively,

the applicability of studies conducted in other countries, can tailor a protection regime for plant varieties on the basis of national requirements.

Additional flexibility in the article 27(3) language can be found in the use of the expression “an” effective sui generis system, as opposed to “the” effective system. The language implicitly allows nations to determine the type of sui generis system they will promulgate to protect plants.¹²⁴ Allowing members the choice of a sui generis system of protection provides the opportunity to promote innovative plant breeding while simultaneously preserving genetic biodiversity and traditional forms of farming.

Further, TRIPS implies effective protection of all plant varieties in leaving the term “plant variety” undefined. Overall, the TRIPS requirements for plant variety protection can be satisfied if the national system for plant variety protection possesses characteristics that generally apply for protecting real property. In broad terms, the ability to identify and protect creativity in plant breeding while also accommodating national goals forms the foundation of any effective protection regime for plants.¹²⁵

Sui Generis System

Broadly, a sui generis system refers to an alternate model of protection created outside the prevailing intellectual property regime. The term sui generis means “special, unique or interpretative.”¹²⁶ The option of incorporating a sui generis system was introduced specifically to enable developing nations to tailor their own regime. Partly, the idea of a sui generis system was introduced in the Uruguay negotiations because the EU was opposed to introducing a plant patent, whereas the United States and Japan favored protecting plants using patents. The EU protects plant varieties using a sui generis form of protection under the European Patent Directive on Biotechnology.¹²⁷ Internationally, the UPOV Convention is another sui generis model based on the European regime for plant protection.¹²⁸

Historically, the Convention developed out of a particular interest to develop seed trade and to promote “equity between breeders, authors and inventors.”¹²⁹ At the invitation of the French government, twelve Western European nations reached an agreement to specifically promote seed trade.¹³⁰ Further, the signatory nations envisioned the protection of breeders’ rights as a means to prevent monopolization of new plant varieties.¹³¹ The resulting UPOV Convention of 1961 was later subject to two major revisions, one in 1978, and another in 1991, each of which has increased the scope of breeder’s rights, as detailed below.¹³² Developed nations, particularly the United States, promote UPOV as the choice sui generis system.¹³³ Although TRIPS carefully avoids harmonizing the plant patent regime, the bargaining strength of the developed nations may have influenced the 1991 Position Paper of the UPOV Convention, based on an Intervention in the Council for TRIPS,¹³⁴ to boldly declare that

international harmonization in the protection of new varieties of plants is essential. The introduction of a system which differs significantly from the harmonized approach based on the UPOV Convention will raise questions with regard to the implementation of the TRIPS Agreement. . . . Should a country introduce a system not compatible with the internationally harmonized system based on the UPOV Convention, this might result in barriers to trade and the transfer of technology.¹³⁵

Even so, developing countries refuse to treat UPOV as either a mandatory or a model *sui generis* system. They base their repudiation on the belief that the UPOV is biased in favor of the commercial interests of industrial breeders and that the UPOV promotes genetic uniformity in agriculture.¹³⁶

An Introduction to UPOV

Eligibility. UPOV vests breeders' rights on uniform and stable varieties that are new and distinct.¹³⁷ A variety that is sufficiently uniform in its relevant characteristics fulfills the uniformity requirement,¹³⁸ while stability is satisfied so long as the relevant characteristics are not altered by propagation.¹³⁹ Article 6 of UPOV deems a variety as "new," provided that, "at the date of filing of the application for a breeder's right, propagating or harvested material of the variety has not been *sold* or *otherwise disposed of to others*, by or with the consent of the breeder, for purposes of exploitation of the variety."¹⁴⁰ Thus, novelty is determined solely by prior sale or disposal of the application material. Public knowledge does not preclude classifying a variety as new. Similarly, plants already cultivated, or those discussed either in reference collections or in publications can still qualify as new varieties. To that extent, varieties already known may still become eligible for protection by clearing the novelty standard. A commonly cultivated plant in remote parts of the world can be deemed "novel," provided it has never been disposed of or sold.

For example, the Tulsi plant is a commonly found herb in India. Owing to its abundant availability, the Tulsi plant is rarely sold, although it is commonly found in most backyards. Because of social faiths and beliefs, Tulsi plants and leaves are also commonly exchanged between people. Nevertheless, under UPOV, Tulsi may qualify as being novel. The fact that Tulsi is commonly exchanged between people will not bar the finding of novelty.

A variety fulfilling the novelty test must still be distinctive to be eligible for protection. Under article 7 of UPOV, a variety is distinct if "it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of filing the application."¹⁴¹ Distinctiveness is achieved provided the application material is distinguishable from a "variety whose existence is a matter of common knowledge" at the time of the application.¹⁴² Under article 14 of UPOV, a variety is "a matter of common knowledge" if it has been the subject "of an application for the granting of a breeder's right" or "has been entered in the

official register of varieties, in any country.”¹⁴³ Thus, the only feature required to qualify as distinctive under UPOV is the ability to distinguish from another variety either entered in the official register or for which an application has been made.

Surprisingly, common knowledge of the application material does not affect the distinctiveness of the variety. Thus, application material that is itself a matter of common knowledge, including by prior registry or application for PBRs, can nonetheless pass the test of distinctiveness provided the material is distinguishable from another that is a matter of common knowledge. The fact that the application material is indistinguishable from well-known or commonly cultivated materials is also not a bar to distinctiveness. Both commonly cultivated and well-known varieties that are indistinguishable from other widely known species will continue to qualify as “distinct” so long as close cousins of the varieties have not themselves become commonly known by process of registry or by application for breeders’ rights. As a consequence, the distinctiveness requirement in UPOV operates as a highly diluted version of the novelty and nonobviousness requirements of the utility patent system.

For instance, the Tulsi plant from the above example will also qualify as “distinctive” under article 7 of UPOV so long as it is distinguishable from a variety for which an application has been made or has been entered in the official register. Tulsi will pass the distinctiveness bar even if it is indistinguishable from a commonly cultivated and well-known Plant B, provided that no application for protection or registry has been made for Plant B. In essence, common knowledge, use, or even cultivation of the application material is not an impediment for qualifying as “new” and “distinct” under UPOV. Unfortunately, this diluted definition may result in both well-known varieties and those trivially different from them being considered distinct.

Interestingly, the criticism that UPOV currently skews in favor of breeders’ rights gains credence considering that the 1961 and 1978 versions of the convention had a broader scope for determining distinctiveness.¹⁴⁴ Mirroring the mandate of the current UPOV text, the 1978 UPOV Convention (UPOV 1978) also required that the new variety should be “clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge.”¹⁴⁵ Common knowledge, however, could be established by “cultivation or marketing already in progress.”¹⁴⁶

The perception of the 1991 UPOV Convention (UPOV 1991) being breeder friendly originated from the elimination of this clause, which had thereto constituted the most reasonable method of proving distinctiveness for nations that were adopting plant protections for the very first time. The danger with the 1991 version is that in countries that newly introduce plant variety protection regimes, commonly cultivated uniform and stable varieties of plants can become protected by clearing the diluted distinctiveness and novelty bar of UPOV 1991.¹⁴⁷ In essence, it could result in creating a private domain by drawing from the public domain.

Scope of Protection. Viewed in light of its highly diluted eligibility requirements, the scope of breeders' rights under UPOV 1991 is excessive. By virtue of article 14(5)(a), breeders' rights extend to both the protected variety and "varieties not clearly distinguishable" from the protected variety.¹⁴⁸ The rights conferred in the article afford breeders the rights over varieties that are clearly indistinguishable from the protected variety, harvested materials and produce made therefrom, thereby preventing brown bagging by farmers.

Moreover, article 14(5)(b) extends breeders' rights to "essentially derived varieties."¹⁴⁹ "Essentially derived varieties" are defined as those that are predominantly derived either from the initial variety, or from another variety that is predominantly derived from the initial variety and is clearly distinguishable from the initial variety.¹⁵⁰ Consequently, breeders' rights extend to clearly indistinguishable (by virtue of article 14(5)(a)) as well as over clearly distinguishable (when read with article 14(5)(b)) derivatives of the protected variety.

In essence, once the breeder arrives at a variety, UPOV 1991 rights protect all the derivatives of that variety, even if they are distinguishable from the initial protected variety. That is, a breeder's rights over Fruit X include rights over that fruit and over clearly indistinguishable and distinguishable varieties or derivatives of the fruit. Assume, for example, that Farmer, using an allowance for personal experimentation under article 15, derives Berry Y, which is clearly indistinguishable from Fruit X. Then, Farmer derives Pea Z from Berry Y. Even if Pea Z is clearly distinguishable from both Fruit X and Berry Y, breeders' rights under UPOV extend over both Berry Y and Pea Z, since both are derived from Fruit X. Thus, a breeder can claim rights over the experimented varieties of other farmers and breeders even if the varieties are clearly distinguishable from the protected variety.¹⁵¹

The broad scope of breeders' rights that currently exists under UPOV has resulted in a correspondingly narrow array of farmers' rights. Textually, UPOV 1991 circumscribed the rights of farmers by enumerating specific limitations to their rights. Under UPOV 1991, farmers are prevented from saving seeds or replanting protected varieties. Furthermore, article 15 limits the ability of governments to provide for farmers' rights. According to the article, governments can provide farmers' rights only "within reasonable limits and subject to the safeguarding of the breeder's legitimate interests."¹⁵² These limitations prevent governments from making concessions to farmers that would otherwise allow them to balance welfare with trade. Nowhere is such a balance more important than in third world countries where farmers generally belong to the poorer societal classes.

Exceptions to breeders' rights are detailed in article 15 of UPOV 1991, which discusses two types of exceptions: compulsory and optional.¹⁵³ The compulsory exceptions include acts done for private, noncommercial purposes and experimental purposes. Breeders, however, can override these exceptions by conditioning initial access to the protected variety on forfeiture of these rights. Furthermore, the broad ambit of breeder's rights result in limiting the scope of the

experimental use exception.¹⁵⁴ The above discussion highlights that breeders' rights under UPOV 1991 extend to varieties "essentially derived" either from the initial variety or its first generation.¹⁵⁵ Although acts done for experimental purposes do not amount to infringement, if the experimentation on a protected variety results in another variety, the breeder (of the protected variety) will obtain rights over that experimented variety even if it is clearly distinguishable from the protected variety. Notably, under UPOV 1978, breeders' rights precluded unauthorized production for commercial marketing, offering for sale, or marketing of protected plant varieties.¹⁵⁶ Even so, the treaty seemingly encouraged experimenting around the protected variety by specifying that "[a]uthorisation by the breeder shall not be required either for the utilization of the variety as an initial source of variation for the purpose of creating other varieties or for the marketing of such varieties."¹⁵⁷

Article 17 of UPOV 1991 provides an additional public interest exception. Unfortunately, the term "public interest" is not defined, nor does the treaty indicate who determines when "public interest" is affected. Thus, it remains unclear, whether a welfare issue concerning the detrimental effect on farmers could qualify as a public interest requirement on its own, especially if a substantial portion of the population is dependant on agriculture. Nonetheless, determining the limitations of breeders' rights and defining "public interest" is critical to avoiding the maladies that developing nations previously faced with the issue of pharmaceutical patents. On the basis of obstacles that the pharmaceutical patents dispute continues to present to developing nations, these nations have a potent interest in demanding term clarifications under UPOV.¹⁵⁸

PBRs in the Context of Agricultural Subsidies

The above discussion provides a perspective on the barriers affecting agricultural trade. The debate on the issues can be appreciated by understanding the effect on trade from each of these barriers. In 1997, for example, the U.S. Department of Agriculture's Economic Research Service (ERS) and Foreign Agricultural Service (FAS) estimated the cost of foreign trade barriers to U.S. agricultural exports at \$5.8 billion annually.¹⁵⁹ This sum included the impact on U.S. agricultural exports from both foreign agricultural subsidies as well as from lack of plant variety protection.¹⁶⁰ While acknowledging that lack of PBRs does impact trade, the effect seems miniscule, however, when juxtaposed with the amount of trade displaced by the \$300 billion in subsidies that is distributed within developed nations.

The effect on trade owing to the lack of PBRs has been minimal for two reasons. First, subsidies determine whether exports will occur, and so long as developed nations heavily subsidize their agricultural sectors, they easily displace both authorized and unauthorized protected varieties from the international market. Second, private market players do not operate in countries without plant

variety protection. Even in the few developing nations where such companies are established, their presence tends to be limited. Hence, the extent of losses from unauthorized reproduction is minimal.

Arguably, the preceding analysis discounts the international market for lost exports to the non-PBRs national markets. That is, the non-PBRs nations artificially prevent the demand in their markets from being reflected in the international market, thereby resulting in international trade distortions. Even assuming optimistically that introducing PBRs could translate into more developing nations markets, any benefits from the PBRs to the developing countries will be offset by subsidies. Thus, while the breeder may benefit from the new markets, the WTO objective of benefiting the developing nations will remain unfulfilled. The bottom line is that *creating intellectual property rights will not be beneficial if the markets remain artificially closed from subsidies*. The arguments regarding the advantages and disadvantages of introducing PBRs remain inconsequential until negotiations on agricultural subsidies are completed in a manner that compels developed nations to fulfill their obligations under the WTO agreements. Poorer nations cannot benefit from agricultural trade unless the subsidies that plague the markets are either reduced or eliminated.

CONCLUSION

One of the WTO's biggest failures has been its predisposition for treating all barriers to trade equally without adequately considering the extent of barriers on trade. This shortcoming has resulted in the WTO's inability to deal with agricultural issues that could have benefited the poorer nations by directly promoting more equal trading partners. Consequently, the WTO has been grossly unjust to the poorer nations whose real and developmental losses from subsidies easily overshadow the effects of other barriers to both agricultural and nonagricultural trade. The WTO has left the uncomfortable impression that its success lies in removing trade obstacles that are beneficial to the developed world at the cost of stripping poorer nations of measures that once contributed to welfare in their respective nations. In terming itself as a negotiation forum for nations, the WTO has enabled the better negotiators—the developed nations—to get the better of the poorer nations.¹⁶¹

NOTES

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2. Editorial, *About That Free Trade*, N.Y. Times, May 15, 2006, at A20.
3. *Id.*

4. *Id.*

5. Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Apr. 15, 1994, 33 I.L.M. 1125 (1994) [hereinafter Final Act].

6. *NAFTA and GATT Intellectual Property Issues*, Ladas & Parry Newsletters & Bulls., Dec. 1994, available at <http://www.ladas.com/BULLETTINS/1994/NAFTAGATT.html> (discussing disadvantages of GATT).

7. WTO, *Understanding the WTO—Agriculture: Fairer Markets for Farmers*, http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm3_e.htm (last visited Feb. 15, 2006)

[hereinafter WTO, *Understanding the WTO—Agriculture*].

8. Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410 (1994) [hereinafter AOA].

9. Agreement on Subsidies and Countervailing Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14 [hereinafter SCM Agreement].

10. *The Cancun Challenge*, *Economist*, Sept. 6, 2003, at 59.

11. See generally Editorial, *Napoleon's Bittersweet Legacy*, *N.Y. Times*, Aug. 11, 2003, at A14 (outlining the effects of subsidies on both developed and poor countries).

12. Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments—Results of the Uruguay Round, 33 I.L.M. 1197 (1994) [hereinafter TRIPS].

13. SCM Agreement, *supra* note 9, art. 1.

14. *Id.*

15. See ActionAid Int'l, *Farmgate: The Developmental Impact of Agricultural Subsidies* 3 (2002), http://www.actionaid.org/wps/content/documents/41_1_farmgate_media_briefing.pdf.

16. See *id.* at 3, 4.

17. See AOA, *supra* note 8; see also Press Release, Int'l Food Pol'y Research Inst., *Wealthy Countries' Trade Policies Sap the Economies of Developing Nations*, Aug. 26, 2003), available at <http://www.ifpri.org/pressrel/2003/pressrel20030826.pdf> [hereinafter IFPRI Press Release].

18. Inst. for Agric. & Trade Pol'y, *WTO Agreement on Agriculture: A Decade of Dumping* 5 (2005), http://www.globalpolicy.org/soecon/trade/subsidies/2005/02_dumping.pdf.

19. *Id.*

20. *Id.* at 4.

21. See generally Jagdish Bhagwati, *Reshaping the WTO*, *Far E. Econ. Rev.*, Jan./Feb. 2005, at 27, available at http://www.columbia.edu/~jb38/index_paper01.html.

22. *Id.*

23. *Id.*

24. WTO, *The Ministerial Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries*, http://www.wto.org/english/tratop_e/agric_e/ag_intro06_netfood_e.htm (last visited Jan. 12, 2006) [hereinafter Ministerial Declaration]; see also WTO, *Understanding the WTO—Agriculture*, *supra* note 7.

25. WTO, *Understanding the WTO—Agriculture*, *supra* note 7.

26. *Id.*

27. Bhagwati, *supra* note 21.

28. Devinder Sharma, *Bhagwati, Globalization, and Hunger*, Dissident, Mar. 29, 2005, <http://www.globalpolicy.org/soecon/trade/subsidies/2005/0329bhagwati.htm>.
29. SCM Agreement, *supra* note 9.
30. AOA, *supra* note 8.
31. SCM Agreement, *supra* note 9.
32. AOA, *supra* note 8.
33. WTO, *Understanding the WTO—Non-tariff Barriers: Red Tape, etc.*, http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm9_e.htm (last visited Mar. 10, 2006) [hereinafter WTO, *Non-tariff Barriers*]; SCM Agreement, *supra* note 9.
34. SCM Agreement, *supra* note 9, art. 2.2 (stating that subsidies need to be specific).
35. *Id.* art. 8.
36. *Id.* art. 3.
37. *Id.*
38. *Id.* art. 2.
39. WTO, *Subsidies and Countervailing Measures: Overview*, http://www.wto.org/english/tratop_e/scm_e/subs_e.htm (last visited Mar. 10, 2006).
40. SCM Agreement, *supra* note 9, art. 2.
41. *Id.* art. 5.
42. *Id.* art. 2.
43. AOA, *supra* note 8, pmb1.
44. *Id.*
45. *Id.*
46. *Id.* annex 1.
47. *Id.* art. 3–12.
48. See *supra* note 35.
49. AOA, *supra* note 8, annex 2.
50. *Id.*
51. WTO, Agriculture—Explanation of the Agreement—Domestic Support, http://www.wto.org/english/tratop_e/agric_e/ag_intro03_domestic_e.htm (last visited Mar. 10, 2006).
52. AOA, *supra* note 8, art. 6.
53. *Id.* art. 6(4)(b).
54. *Id.* art. 9.
55. *Id.*
56. WTO, *Understanding the WTO—Agriculture*, *supra* note 7.
57. AOA, *supra* note 8, art. 13.
58. *Id.*
59. *Id.*
60. *Id.*; see also WTO, Agriculture—Explanation of the Agreement—Other Issues, http://www.wto.org/english/tratop_e/agric_e/ag_intro05_other_e.htm (last visited Mar. 10, 2006) (discussing the Peace Clause).
61. AOA, *supra* note 8, art. 13.
62. WTO, *Non-tariff Barriers*, *supra* note 33.
63. See Robert E. Baldwin, *Failure of the WTO Ministerial Conference at Cancun: Reasons and Remedies*, World Econ., June 2006, at 677.
64. See Alan Matthews, *The Road from Doha to Hong Kong in the WTO Agricultural Negotiations: A Developing Country Perspective*, 32 Eur. Rev. Agric. Econ. 561 (2005).

65. ActionAid Int'l, *supra* note 15, at 1.
66. *Id.* at 2.
67. IFPRI Press Release, *supra* note 17.
68. *Id.*
69. *Id.*
70. *Id.*
71. *Id.*
72. Charity Wire, *Rich Nations Need to Work Together to Eliminate Crop Subsidies; Would Triple Agricultural Trade in Developing World*, <http://www.charitywire.com/charity28/03317.html> (Apr. 2, 2003).
73. See Devinder Sharma, *The Case for True Reform in Farm Trade*, India Together, http://www.indiatogether.org/agriculture/opinions/ds_tp.htm (Oct. 2001).
74. Oxfam, *Stop the Dumping!: How EU Agricultural Subsidies Are Damaging Livelihoods in the Developing World 3* (Oxfam, Briefing Paper No. 31, 2002), <http://www.globalpolicy.org/soecon/trade/subsidies/2002/10stopdumping.pdf>.
75. See, e.g., Wole Akande, *How Agricultural Subsidies in Rich Countries Hurt Poor Nations*, <http://www.yellowtimes.org/article.php?sid=791> (last visited May 15, 2006).
76. Oxfam, *supra* note 74, at 3.
77. *Id.* at 5.
78. AOA, *supra* note 8, art. 13.
79. TRIPS, *supra* note 12.
80. AOA, *supra* note 8.
81. ActionAid Int'l, *supra* note 15, at 1.
82. WTO, *Non-tariff Barriers*, *supra* note 33.
83. India and Brazil are examples.
84. See generally Srividhya Ragavan, *The Jekyll and Hyde Story of International Trade: The Supreme Court in PhRMA v. Walsh and the TRIPS Agreement*, 38 U. Rich. L. Rev. 777 (2004).
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86. Yves Engler, *Empire or Africa*, ZNet, <http://www.zmag.org/content/showarticle.cfm?ItemID=4510> (Nov. 16, 2003).
87. TRIPS, *supra* note 12, art. 27(3).
88. *Plant Breeding*, Wikipedia, http://en.wikipedia.org/wiki/Plant_breeding (last visited Apr. 5, 2006).
89. See generally *id.*
90. See Per Pinstруп Andersen & Rajul Pandya-Lorch, *The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation* 245–249 (2001).
91. Andre Heitz, *The History of the UPOV Convention and the Rationale for Plant Breeders' Rights*, in 1991 Seminar on the Nature and Rationale for the Protection of Plant Varieties Under the UPOV Convention 25–26 (1994).
92. *Id.*
93. *Id.* at 26.
94. N. Rajagopala Ayyangar, Report on the Revision of the Patents Law ¶8 (1959) [hereinafter Ayyangar Report].
95. Charles Sargant, Departmental Committee for Improvements to Patents and Designs 1931 (1929).

96. *Id.*; see Patents & Designs Amendment Act, 1919, §§ 38(A)–38(B) (Eng.); Ayyangar Report, *supra* note 94, at 31, 33, 34 (discussing the Sargent Report and detailing how section 38A of the Patents and Designs Amendment Act of England marked an introduction to restrictions on patent protections for food and introduced process patenting, while section 38(B)(2) introduced compulsory licensing of patents relating to food substances).

97. Ayyangar Report, *supra* note 94, at 38 (detailing that, as late as 1956, several European countries restricted patents on food products, specifically citing the laws of France, Switzerland, Belgium, and Sweden); Heitz, *supra* note 91, at 22 n.26 (highlighting that Germany excluded inventions relating to food as late as in 1967).

98. Heitz, *supra* note 91, at 23; see also Ayyangar Report, *supra* note 94 (quoting Lord Parker's address to the Chartered Institute of Patent Agents).

99. See Law on the Protection of New Plant Varieties, Law No. 70–489 of June 11, 1970 (Fr.), available at <http://www.upov.org/en/publications/npvlaws/france/france.pdf> (last visited Apr. 15, 2006).

100. Heitz, *supra* note 91, at n.28.

101. *Id.* at 24.

102. No. 128 of March 17, 1921. *Id.* at 24–25.

103. *Id.* at 25 (reporting that it was only in 1953 that Germany ultimately passed the Seed Law).

104. International Union for the Protection of New Varieties of Plants, Dec. 16, 1961, 33 U.S.T. 2703, 815 U.N.T.S. 89 [hereinafter UPOV 1961].

105. Heitz, *supra* note 91, at 25–26.

106. 35 U.S.C. §§ 161–168 (1930).

107. Heitz, *supra* note 91, at 23.

108. 7 U.S.C. §§ 2321–2583 (2004).

109. *J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 127 (2001).

110. Jay P. Kesan, *Intellectual Property Protection and Agricultural Biotechnology—A Multidisciplinary Perspective*, 44 *Am. Behav. Scientist* 464, 486–487 (2000).

111. *Id.* (manuscript at 47–49).

112. See Doha Declaration, *supra* note 85.

113. Stephen B. Brush, *Genetically Modified Organisms in Peasant Farming: Social Impact and Equity*, 9 *Ind. J. Global Legal Stud.* 135 (2001).

114. *Id.* at 147.

115. *Id.* at 148.

116. *Id.* at 147.

117. Cassandra Klotz-Ingram & Kelly Day-Rubenstein, *The Changing Agricultural Research Environment: What Does It Mean for Public-Private Innovation?*, 2 *AgBioForum* 24, 26 (1999).

118. L. J. Butler & B. W. Marion, *The Impact of the Patent Protection on the U.S.: Seed Industry and Public Plant Breeding*, 16 *Stud. Org. & Control U.S. Food Sys.* 117 (1985).

119. See, e.g., R.K. Perrin et. al., *Some Economic Effects of the US Plant Variety Protection Act of 1970* (1983).

120. Butler & Marion, *supra* note 118, at 117.

121. TRIPS, *supra* note 12.

122. *Id.* art. 27(3).

123. See Gerard Bodeker, *Traditional Medical Knowledge in Intellectual Property Rights & Benefit Sharing*, 11 *Cardozo J. Int'l & Comp. L.* 785, 790 (2003); Michael Halewood, *Indigenous and Local Knowledge in International Law: A Preface to Sui Generis Intellectual Property Protection*, 44 *McGill L.J.* 953, 965 (1999).

124. Bodeker, *supra* note 123, at 790; Halewood, *supra* note 123, at 965.

125. See the chapter by Keith Aoki and Kennedy Luvai in the patent volume.

126. GRAIN, *Beyond UPOV*, <http://www.grain.org/briefings/?id=127> (July 1999).

127. D. Leskien, *The European Patent Directive on Biotechnology*, 36 *Biotechnology & Dev. Monitor* 16 (1998).

128. UPOV 1961, *supra* note 104.

129. Heitz, *supra* note 91, at 34.

130. *Id.* at 33.

131. *Id.* at 34.

132. UPOV 1961, *supra* note 104; International Union for the Protection of New Varieties of Plants, Oct. 23, 1978, 33 U.S.T. 2703, 1861 U.N.T.S. 281 [hereinafter UPOV 1978]; International Union for the Protection of New Varieties of Plants, Mar. 19, 1991, S. Treaty Doc. No. 104–17 (1995) [hereinafter UPOV 1991].

133. GRAIN, *supra* note 126.

134. Int'l Union for the Prot. of New Varieties of Plants, *International Harmonization Is Essential for Effective Plant Variety Protection, Trade and Transfer of Technology*, <http://www.upov.int/en/about/pdf/international%20harmonization.pdf> (Sept. 19, 2002).

135. *Id.*

136. GRAIN, *supra* note 126.

137. See UPOV 1991, *supra* note 132.

138. *Id.* art. 8.

139. *Id.* art. 9.

140. *Id.* art. 6.

141. *Id.* art. 7.

142. *Id.*

143. *Id.* art. 14.

144. Compare UPOV 1961, *supra* note 104, art. 6(1)(a) (stating that the new variety must be clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge at the time when protection is applied for, and that common knowledge may be established by reference to various factors, including cultivation or marketing already in progress, entry in an official register of varieties already made or in the course of being made, inclusion in a reference collection, or precise description in a publication), and UPOV 1978, *supra* note 132, art. 6(1)(a) (copying the language of UPOV 1961, art. 6(1)(a)), with UPOV 1991, *supra* note 132, art. 7 (declaring that a plant variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application, but specifically detailing that the filing of an application for the granting of a breeder's right or for the entering of another variety in an official register of varieties, in any country, shall be deemed to render that other variety a matter of common knowledge).

145. UPOV 1978, *supra* note 132, art. 6(1)(a); UPOV 1991, *supra* note 132, art. 7.

146. UPOV 1978, *supra* note 132, art. 6(1)(a).

147. UPOV 1991, *supra* note 132, art. 6, 7.

148. *Id.* art. 14(5)(a).

- 149. *Id.* art. 14(5)(b).
- 150. *Id.*
- 151. See *id.* art. 14.
- 152. UPOV 1991, *supra* note 132, art. 15(2).
- 153. *Id.* art. 17.
- 154. *Id.* art. 15(1)(ii).
- 155. *Id.* art. 14(5).
- 156. *Id.* art. 5(1).
- 157. *Id.* art. 5(3).
- 158. See generally Srividhya Ragavan, *Dying to Dine: International Trade Barriers Affecting Food Rights* (2006) (manuscript at 20–21, on file with author).
- 159. Geoffrey S. Becker, *Agricultural Exports: Technical Barriers to Trade*, CRS Report for Congress, <http://www.ncseonline.org/NLE/CRSreports/Agriculture/ag-43.cfm> (last visited Mar. 24, 2005).
- 160. *Id.*
- 161. GRAIN, *supra* note 126.