

Feeding the World One Seed at a Time: A Practical Alternative for Solving World Hunger

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I. INTRODUCTION

¶1 One of the purposes for establishing international organizations was to eradicate human suffering witnessed during WWII. International conventions and declarations that have been established and agreed upon, relating to the right to food, call for states to consider substantial measures that would afford the hungry with means to feed themselves, but states have failed to live up to such measures.¹ Currently, over one billion people subsist on less than one dollar a day, and more than 800 million people do not have enough food to meet daily energy standards.² According to the Food and Agriculture Organization of the United Nations (FAO), “as many as 840 million people – a number that exceeds the combined populations of Europe the United States, Canada, and Japan— currently do not have enough to eat.”³ Hunger severely impacts the global community in numerous ways, and therefore urgent measures need to be taken by states who have agreed to abide by international covenants regarding the right to food.

¶2 To overcome the inadequacies of current foreign aid programs, in ways that address the basic food production challenges facing developing countries, the international community must embrace newly designed genetically modified agricultural seeds (GM seeds) to fill the void that current foreign food aid programs have been unable to fill.⁴ Genetically modified seeds would allow developing countries to compensate for the factors that impede successful harvests. These technologies would enable countries facing difficult circumstances of drought and pestilence to overcome such issues by inserting genetic modifications into seeds that enable such seeds to compensate for the

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¹ See *infra* section III (for an in-depth explanation of the international covenants and the obligations they impose upon member nations).

² MAHENDRA SHAH, MAURICE STRONG, FOOD IN THE 21ST CENTURY: FROM SCIENCE TO SUSTAINABLE AGRICULTURE, 21(1999).

³ *Id.*; see also JILL MACKEY, PLANT BIOTECHNOLOGY CAN ENHANCE FOOD SECURITY AND NUTRITION IN THE DEVELOPING WORLD: PART 1 (2004) (“nearly 30% of the world’s population suffers from some form of malnutrition, and in the developing world, 1 in 5 people (777 million) are chronically undernourished.”).

⁴ Genetically modified agricultural seed are those that have had genes from other plants, or organisms inserted into the genetic makeup of the plant to provide them a specific advantage such as: higher yields per acre; pest resistant; drought resistance; increased nutritional value; antibodies to diseases; and also genes can be inserted so that plants do not need fertilizers.

otherwise dire conditions. Such a strategy would allow impoverished regions to grow and subsist off of the food they produce, which is the purpose of foreign food aid, and the purpose of covenants that advocate for the elimination of international hunger.

¶3 Today, developed countries have an opportunity to do something for the world, a chance to save millions of lives that are lost to starvation each year. This paper proposes a "GM Seeds for Africa" program, which consists of the international community brokering a deal with agribusiness companies that produce GM seeds, to purchase subsidized GM seeds to be distributed to rural farming communities throughout Sub-Saharan Africa. The deal parallels AIDS vaccines for Africa programs that were established around 2001. The implementation of such a program would be the most efficient way of realizing the international community's dream of eradicating hunger and enabling hungry communities around the world to finally have sufficient amounts of food.

¶4 First, this paper provides a background discussion of the development and use of genetically modified foods, including a history on how genetically modified plants came to be traded in the international market place. The purpose of the discussion is to alleviate any contentions that genetically modified seeds are unhealthy, or not safe for human consumption. Secondly, an analysis of prior international covenants concerning the right to food will be identified and analyzed. A clear understanding of the right to food is a necessary precursor to understanding why supplying GM agricultural products is vital to achieving the international community's goal of providing a right to food to every person on earth. Thirdly, this paper will consider why GM seeds best address the inadequacies of the current foreign food aid programs. Providing these seeds allows states to live up to their mandate regarding foreign food aid. Lastly, this paper will advocate for states and international institutions to broker a deal with agribusiness companies that would allow those companies to provide GM seeds to developing nations at a reduced price.

II. BACKGROUND

¶5 In the current political debate regarding genetically modified (GM) agricultural products, arguments often ensue without adequately defining what a genetically modified product consists of. Nor do they describe the scientific process in which plants go through during genetic alterations. Consideration of the scientific processes that are involved in creating a GM product is essential if one is to logically determine whether GM products are in fact dangerous to humans, and furthermore whether or not GM products could be considered as a means to combat hunger.

¶6 Genetically engineered, or GM foods⁵ are products that have had their genetic makeup altered through the process of recombinant DNA, or gene splicing, which gives the product a specific desirable trait.⁶ The process of recombinant DNA occurs when

⁵ Different scholarly works have used the terms GM and genetically engineered products in the same manner. Other scholarly works have considered GM products to be those products that have been created through forced breeding techniques, and not created through forced genetic insertion from DNA from one plant to another, which is controlled in a laboratory. For the purposes of this Note, GM will refer to genetically altered, or genetically engineered agricultural products and not those which have undergone forced breeding.

⁶ Linda Bren, *Genetic Engineering: The Future of Foods?*, FDA CONSUMER MAGAZINE, Nov./Dec. 2003,

foreign deoxyribonucleic acid (DNA) is extracted from one cell and combined with another cell.⁷ Genetic modification of cells occurs through the injection of DNA into a cell, or by allowing bacteria to infect the cell.⁸

Genetically engineered plants, as discussed here, are created from very different procedures from plants that are altered through conventional forced breeding techniques. Genetically engineered (GM) plants are manipulated through inserting a DNA strand in order to ensure a specific outcome, or trait,⁹ whereas plants created through conventional breeding techniques involve processes that occur in nature such as mixing genetic material from different sexually compatible plant species.¹⁰ Conventional breeding is initiated in hopes of producing a plant with the advantageous characteristics of the two plants that were combined, which is also referred to as hybridization.¹¹ Traditional selection processes do not create new traits within a plant, but merely exploit dormant advantageous traits that have always been present within the species.¹² Furthermore, natural mutations of plants have occurred throughout time, which has allowed plants to adapt to harsh conditions that they would not have otherwise survived.¹³ Such natural breeding is familiar to most people under the rubric of natural selection or evolution.¹⁴

Two generations of genetically modified products have ensued since the invention of recombinant DNA processes. The first generations of GM seeds were designed to help farmers increase yields, without adding supplementary pesticide and fertilizer associated with conventional yield-increasing farming techniques, by creating plants that could resist pests and diseases and were able to tolerate herbicides used to kill surrounding weeds.¹⁵ First generation GM seeds enabled more plants to survive the growing process, which generated higher yields, and also enabled farmers to reduce costs otherwise associated with applying pesticides to crops.¹⁶

The second generation, or next¹⁷ generation, of GM products were created to benefit consumers by focusing on nutrition, taste and aesthetics.¹⁸ Second generation GM

available at http://fda.gov/fdac/features/2003/603_food.html.

⁷ Darren Smits & Sean Zabroski, *Trade and Genetically Modified Foods: GMOs: Chumps or Champs of International Trade?*, 1 *ASPER REV. INT'L BUS. & TRADE L.* 111, 112 (2001).

⁸ *Id.*

⁹ *Id.*

¹⁰ Biotechnology currently allows for genetic material from different species, plants and other families to be inserted into a specific plant, which provides that specific plant with the benefits of the inserted gene.

¹¹ MICHAEL HANSON, *GENETIC ENGINEERING IS NOT AN EXTENSION OF CONVENTIONAL PLANT BREEDING* (2000), <http://www.purefood.org/ge/hansenGEexpl.cfm>.

¹² *Id.*

¹³ *Id.* (“[C]onventional breeding develops new plant varieties by the process of selection, and seeks to achieve expression of genetic material which is already present within a species.” “Conventional breeding employs processes that occur in nature, such as sexual and asexual reproduction. The product of conventional breeding emphasizes certain characteristics.”).

¹⁴ See Sara M. Dunn, *From Flav'r Sav'r to Environmental Saver? Biotechnology and the Future of Agriculture, International Trade and the Environment*, 9 *COLO. J. INT'L ENVTL. L. & POL'Y* 145, 148-149 (1998) (“Historically, producers have also influenced natural selection favoring crops that were bred to enhance desirable traits such as higher yields or drought resistance.”).

¹⁵ Bren, *supra* note 6.

¹⁶ *Id.*

¹⁷ Research and development regarding the second generation of GM products is still taking place and some consider the second generation as the “next” generation, and occurring through the development of GM seeds that provide those crops with more nutritional value for the consumer.

¹⁸ Dunn, *supra* note 14.

modifications have allowed for an improvement in the nutritional value of certain fruits and vegetables, reduced allergens and toxins, have allowed for antibodies to diseases to be inserted into fruits and vegetables, and have improved the taste of certain fruits and vegetables.¹⁹ Currently, scientists are developing GM products that will reduce the bitterness in citrus fruits, reduce saturated fats in certain cooking oils (canola oil), and reduce the gassiness effect from beans. Scientists are also developing plants that produce antibodies to combat cancer and heart disease.²⁰

A. *History of GM Products and US GM Policy*²¹

¶10

Recombinant DNA processes were first developed in the 1970's by the United States agribusiness companies. Such efforts sparked public concern that these alterations would cause genetically mutated organism to be released into the atmosphere.²² By the 1980's GM products began to be ready for commercialization, so the United States Congress began to hold hearings regarding the technology involved in creating GM food products.²³ The hearings took place during the time when similar biotechnological revolutions were occurring throughout the world, an effort lead by US-based companies and science.²⁴ As the United States continued to develop GM processes and techniques during the Reagan administration and later in the first Bush administration, each administration established an evolving policy that aimed to ensure safety through three levels of regulation.²⁵ Governmental regulation of GM research continued into the Bush I administration, which created guidelines for GM research and productions, and also for developing further agency guidance and responsibility.²⁶ The United States continued the

¹⁹ *Id.*

²⁰ See P.C. Prakash, 126 *The Genetically Modified Crop Debate in the Context of Agricultural Revolution*, in *PLANT PHYSIOLOGY* 8-15 (2001), available at <http://www.plantphysiol.org/cgi/reprint/126/1/8.pdf>.

²¹ Since genetic modifications pertaining to agricultural products originated in the United States the historic section regarding GM products will focus on US history to the point in which they were introduced onto the public.

²² Emily Marden, *Risk and Regulation: U.S. Regulatory Policy on Genetically Modified Food and Agriculture*, 44 B.C. L. REV. 733, 736 (2003). (much to the skeptics dismay, the "Little Shop of Horrors" type plant creature were never created).

²³ *Id.*

²⁴ *Id.* at 737. (this period is referred to as the "green revolution," which experienced massive increases in global yields for agricultural products due to technological advances with seed hybrids and the increased use of fertilizers and pesticides. Although, this period did not use GM products, but relied upon fertilizers and pesticides to ensure that disease and pests would not destroy certain crops. US companies were the leaders in selling hybrid seeds to countries around the world, but GM seeds were not readily available at this time).

²⁵ *Id.* (The three policy steps initiated by the Bush Administration included; first US policy would focus on the products created by GM techniques, not the process required to create GMO products. Secondly, the US would only regulate verifiable scientific risks (scientific risk assessment), and lastly the policy applied current agricultural regulations and standards to GM products and processes.); see also, RANDY VINES, VIRGINIA COOPERATIVE EXTENSION, *THE REGULATION OF BIOTECHNOLOGY* (2002) (in 1986, the government created a "'Coordinated Framework for Regulation of Biotechnology' which established the policy that a product of biotechnology should be regulated according to its composition and its intended use, rather than by the method used to produce it.") (this report provides a useful background into the US policy development pertaining to GM products), available at <http://www.ext.vt.edu/pubs/biotech/443-006/443-006.pdf>.

²⁶ Marden, *supra* note 22 at 740. (in 1992, the Bush Administration created the "Exercise of Federal Oversight Within Scope of Statutory Authority: Planned Introductions of Biotechnology Products into the Environment," which provided governmental agencies that were overseeing GM research guidance, and

Regan/Bush policy throughout the Clinton administration, which included the period when GM products were introduced to the market for human consumption.²⁷

¶11 During the Bush I administration, regulatory responsibility was assigned to three governmental agencies, the Food and Drug Administration (FDA), the United States Department of Agriculture (USDA), and the Environmental Protection Agency (EPA). The FDA ensured that foods made from GM products were safe for human consumption.²⁸ The FDA has authority through the Federal Food, Drug, and Cosmetic Act (FD&C Act) to regulate foods (including food from bioengineered plants) for human and animal consumption.²⁹ The USDA's Animal and Plant Health Inspection Service regulates importation of products used through GM production and interstate movement of GM products, oversees the protection of conventional crops from hazards, and is responsible for issuing field test permits for GM products that have not hit the market yet.³⁰ Lastly, the EPA ensures pesticides used in conjunction with GM products are safe for human and animal consumption.³¹ Therefore, agency responsibility has divided GM product regulation into three categories: safe to eat [FDA], safe to grow [USDA], and safe for the environment [EPA].³²

¶12 In 1994, the flavor savor tomato, the first GM product was introduced to the United States market.³³ The tomato was approved by the FDA, which determined the genetic alterations that made the tomato longer lasting were "as safe as other commercial

also reiterated the Regan administration's policy that regulation should be limited to science based risk assessment). *See also* Exercise of Federal Oversight within Scope of Statutory Authority: Planned Introduction of Biotechnology Products into the Environment, 57 Fed. Reg. 6753 (OSTP 1992).

²⁷ *See generally* Marden, *supra* note 21.

²⁸ *See* Vines, *supra* note 25 (the charts report provides a synopsis of the FDA's role in regulating GM seeds and products).

²⁹ Bren, *supra* note 6. It is paramount to understand how agencies that oversee the research and development of GM products define a GM product. The FDA defines genetically engineered products as "foods produced from crops whose genetic makeup has been altered through a process called recombinant DNA, or gene splicing, to give the plant a desirable trait. Genetically engineered foods are also known as biotech, bioengineered, and genetically modified. [A]lthough, 'genetically modified' can also refer to foods from plants altered through other breeding methods."

³⁰ Marden, *supra* note 22; *see also*, <http://www.ers.usda.gov/Briefing/Biotechnology/glossary.htm>. The USDA defines genetic engineering as "a technique used to alter or move genetic material (genes) of living cells. Narrower definitions are used by agencies that regulate genetically modified organisms (GMOs), in the United States, under guidelines issued by the USDA's Animal and Plant Health Inspection Service, genetic engineering is defined as the genetic modification of organisms by recombinant DNA techniques.

³¹ Bren at 6; *see* <http://www.epa.gov/agriculture/ag101/cropglossary.html> (the EPA defines GM foods as those "plants that have had genes implanted to improve their performance by making them resistant to certain pesticides, diseases, or insects") (the EPA established several processes to regulate and oversee GM production. In 1992, the EPA published a policy statement including guidelines for foods developed using all methods of traditional plant breeding, including genetic engineering. The statement explained the types of questions that GM developers should strive to answer while assessing GM foods); *see also*, Bren, *supra* at 7 (Also, in 1994, the FDA developed a consultation process to assist GM developers in meeting federal safety standards pertaining to GM products made for commercial consumption, which is still utilized by the FDA today. During the initial steps of the process, FDA scientists advise companies, who are developing GM products, regarding the necessary tests, which would allow them to sufficiently meet federal safety standards. Then, the FDA consultation process has the companies send the results of the test into the agency for scientific evaluation of the tests).

³² These three agencies were responsible for testing the safety of GM products before they originally were allowed for consumer consumption, and still oversee which GM products are allowed for consumer consumption.

³³ Bren, *supra* note 6.

tomatoes.³⁴ Since then, over fifty GM food products have been deemed as safe as their non-genetically altered counterpart, by the EPA.³⁵ Currently, between 70 and 75 percent of all processed foods available in U.S. grocery stores contain ingredients from GM plants, and the majority of international food production utilizes GM products as well.³⁶

The success of the United States agribusiness industry has spawned an international consumption of GM agricultural seeds that are used to grow consumable foods, but some countries have been historically hesitant to accept GM products. The European Union has historically taken a strong stance against GM product growth within the region, and consumption of the goods despite the fact that the majority of foods grown around the world are made by GM seeds.³⁷ Despite arguments by European officials, in July 2003, the Codex Alimentarius Commission³⁸ established international guidelines for biotech food safety, which mirror the FDA guidelines, and deemed GM foods safe for world consumption.³⁹ Furthermore, in 2004, Europe began to open its borders to some forms of GM products by making available a GM tomato puree to European nations, and later approved the marketing of GM Soya and maize throughout Europe.⁴⁰ In 2005, the European Union licensed the growing of GM crops in Europe, which indicates that European officials deem the international support for the plants as evidence of their safety.⁴¹ Today, throughout Europe, the debate rages as to whether they ought to allow GM products to be consumed.⁴² The approval of GM products by the European Union signals that the staunchest opponents of GM foods are beginning to

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* (Also, in 2003, the USDA estimated that over 100 million acres of GM crops were planted in the United States alone.); Thailand: Twenty Percent Increase in GMO Fields, THAI PRESS REPORTS, March 29, 2005. (Since 1996, GM fields have increased by over 30 million acres world-wide, which involves over 10 million farmers in 18 countries; *see also* The GMO conflict: European Biotech Expert Helena von Troil Suggests the US- Europe Trade Dispute over Genetically Modified Products is a Cultural One, SOCIETY OF CHEMICAL AND INDUSTRY August 19, 2001 (In 2002, over 75% of the world's soybean production was made of GM products).

³⁷ Throughout the late Nineties and early twenty-first century, European officials argued that the effects of consuming and planting GM products was unknown, and therefore use regarding the products should be deterred until future research was conducted.

³⁸ Codex, the highest international authoritative body on food standards, is an entity of the World Health Organization (WHO), and the Food and Agriculture Organization of the United Nations, *see* http://www.codexalimentarius.net/web/index_en.jsp (the Codex homepage for more information on the organization) (last visited April 26, 2007). Codex is responsible for determining whether certain foods ought to be labeled as containing certain types of substances. The European Union has advocated for GM agricultural products to contain a label referring to the products' GM traits, *see* Lorraine Heller, Codex and the GM Trade Stalemate, FOOD NAVIGATOR, Apr., 25, 2007.

³⁹ http://www.fao.org/ag/AGN/food/risk_biotech_taskforce_en.stm (see the links to Codex assessments of GM products under the section "Codex principles and guidelines" on the webpage. Also, reports of Codex's GM assessments are available on the right side of the webpage).

⁴⁰ Giancarlo Moschini, Harun Bulut, Luigi Cembalo, *On the Segregation of Genetically Modified Conventional and Organic Products in European Agriculture: A Multi-Market Equilibrium Analysis* 56 J. OF AGRIC. ECON. 347, 348 (2005), available at http://www.card.iastate.edu/faculty/profiles/giancarlo_moschini/moschini-bulut-cembalo-jae.pdf.

⁴¹ Fight GM Now, UK NEWSQUEST REGIONAL PRESS, November 4, 2005.

⁴² *See* <http://www.i-sis.org.uk/KeepGMOOutOfEurope.php> (this website was formulated to advocate for the position that Europe ought not accept GM products); Agribusiness- MEPs Tighten GM -Free Definition, IRISH NEWS, March 3, 2007; Farmers' Fear, Food Future Genetically Modified, Business Daily, March 1, 2007; Italy Should Resist GMO but Keep An Open Mind, Minister Says, ANSA English Media Service, February 28, 2007.

accept the products as safe, and that the staunchest GM opponents cannot find reasons why GM seeds should not be utilized.⁴³

¶14 Opponents of GM products have continued to cling onto the EU's position against GM product as a reason to discount GM products. The anti-GM position has argued that since Europe does not believe the products are safe for human consumption, then the world should not advocate them for humanitarian purposes.⁴⁴ This argument essentially dictates that if we do not clearly know the potential harms, GM foods should not be used for humanitarian purposes.⁴⁵ In defense of GM products, scientists have reiterated the fact that all plants go through natural mutations and processes of natural selection. In this view, GM foods cannot be discounted since they share a common characteristic with plants in the natural order of changing their genetic makeup.⁴⁶ Another point indicating that opponents of GM products are running out of ideas as to why GM products should not be used for human consumption is that, in October 2005, for the first time since the GM debate began, the EU allowed certain GM products to be grown in Europe.⁴⁷ This development may tend to directly refute the European argument and the argument that GM products should not be used for humanitarian purposes.⁴⁸

III. INTERNATIONAL COVENANTS AND INTERNATIONAL AGREEMENTS ELUCIDATE THE RIGHT TO FOOD

¶15 The development and subsequent agreements of numerous international accords regarding the right to food⁴⁹ and the countless number of countries who have agreed to international accords concerning the right to food have arguably created an international right to food. A line of reasoning exists contending that the right to food has become an internationally established law due to the formation of international human rights treaties and international conventions that acknowledge the universal right to food and that create procedures to alleviate hunger worldwide.⁵⁰ By agreeing to such covenants, signatories agree to live up to the covenants' purpose and procedures, which suggests that such states accept the proposition that a right to food is a basic human right that every person ought to have. The right to food was initially considered in the Charter document to the United

⁴³ See Moschini, *supra* note 40.

⁴⁴ *Id.*; see also Fight GM Now, *supra* note 41 ("The European Commission with the active consent of the UK Government at Westminster has begun to licen[s]e the growing of genetically modified crops in Europe.").

⁴⁵ *Id.*

⁴⁶ See generally GEORGE KENT, FREEDOM FROM WANT (2005). (The FDA has indicated that GM products are no more dangerous than non-GM products).

⁴⁷ Moschini, *supra* note 40.

⁴⁸ It should be noted that Europe's allowance of GM crop growth is a new phenomenon and the author of this comment is simply surmising what the new implications signal. Also, it is not clear how many different GM crops will allow to be grown.

⁴⁹ The Right to food is an economic claim stating that every human being has the right to food and that government should strive to provide food to its citizens. See Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights: U.N. ECOSOC, 29th Sess., General Comment No. 15 at 1 U.N. Doc. E/C.12/2002/11 (2002) [hereinafter UNECOSOC] (The right to food is considered sufficiently fulfilled when "every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement.").

⁵⁰ *Infra* Section III of this comment.

Nations' numerous broad statements concerning human rights, and since then the right to food began to slowly cement itself into international human rights law through continual development in the following international covenants.⁵¹

¶16 The first international covenant to recognize food as a basic human right was the Universal Declaration of Human Rights (UDHR), which came into affect on December 10, 1948.⁵² The UDHR was the first international covenant to include food as a basic right that everyone ought to possess.⁵³ More importantly, the UDHR's proclamation that food must be considered a basic human right was an essential pillar for establishing the right to food as a basic human right under international law⁵⁴ The right to food came to life in Article 25 of the UDHR which stated that "everyone has the right to a standard of living adequate for health and well-being of himself and his family, including food..."⁵⁵ The inclusion of the right to food with other rights deemed essential human rights enabled later covenants to add substance to the notion that food ought to be considered as part of a person's well-being.⁵⁶

¶17 Amongst the international covenants recognizing the right to food, the International Covenant on Economic, Social and Cultural Rights (ICESCR) is the most comprehensive of all international accords recognizing a right to food.⁵⁷ The ICESCR is considered the "gold standard" of international agreements specifying an international human right to food because it is the first covenant to specifically states that people ought to have a right to food and people should not be left hungry.⁵⁸ Secondly, given that it specifies certain rights regarding food and is the first covenant to do so, it is important because of the overwhelming international support the Covenant has received.⁵⁹

¶18 Unlike other international agreements that merely elude to the fact that people should be afforded food, the ICESCR fashions specific steps that states should to follow in order to ensure that every person realizes "the fundamental right to freedom from hunger and malnutrition."⁶⁰ Several articles within the ICESCR recognize the right to food and specify steps that states agreeing to the Covenant should take to provide a meaningful right to food to their citizens. Specifically, part II of the ICESCR enumerates general state obligations regarding providing basic levels of food to its citizens, and the responsibilities that each state has to other states that cannot provide food to its people; part III details specific substantive rights that every human being is naturally entitled to, in which the right to food is expressly included; and part IV describes international

⁵¹ Smita Narula, *The Right to Food: Holding Global Actors Accountable Under International Law*, 44 COLUM. J. TRANSNAT'L L. 691, 705 (2006) (Narula provides an excellent summary of the process in which the right to food took in becoming apart of international law).

⁵² Universal Declaration of Human Rights, G.A. Res. 217A, at 71, GAOR, 3d Sess., 1st plen mtg., U.N. Doc A/810 (Dec. 10, 1948) [hereinafter UDHR].

⁵³ *Id.* art. 25 (emphasis added).

⁵⁴ Narula, *supra* note 51, at 705.

⁵⁵ UDHR, *supra* note 52, at art. 25.

⁵⁶ Narula, *supra* note 51, at 705,706.

⁵⁷ International Covenant on Economic, Social and Cultural Rights, G.A. res. 2200A (XXI), 21 U.N.GAOR Supp. (No. 16) at 49, U.N. Doc A/6316 (1966), 933 U.N. T. S. 3, entered into force Jan. 3, 1976 [hereinafter ICESCR].

⁵⁸ ICESCR, *supra* note 57, art. 11.

⁵⁹ <http://www.ohchr.org/english/countries/ratification/3.htm>. (currently one hundred and fifty parties have signed onto the ICESCR. Signatories are parties that are bound by the convention, or who have ratified the convention).

⁶⁰ ICESCR, *supra* note 57, art. 11.2.

implementations of the Covenant.⁶¹ Article 11(1) is critical to the recognition of the right to food because it specifies that the states signing onto the Covenant duly recognize the right to food, and states agree to take steps to ensure that such right becomes a reality:

“[t]he States Parties to the Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food... The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of the international cooperation based on free consent.”

ICESCR Article 11(1)⁶² The ICESCR not only establishes a strong basis for recognizing the right to food, and, more importantly, goes further than other international covenants that recognize the right to food by articulating food-based goals that are neither pervasive nor weak to the point that the goals are ineffective. Article 2(1) of the ICESCR states that:

“[e]ach State party to the present Covenant undertakes to take steps, individually, and through international assistance and co-operation, especially economic and technical, to the maximum of *its available resources, with a view to achieving progressively the full realization* of the rights in the present Covenant by all appropriate means, including particularly the full realization of the rights recognized in the present Covenant by all appropriate means, *including particularly the adoption of legislative measures.*”⁶³ (Emphasis added).

The ICESCR explicitly mandates that states who sign onto the Covenant take measures to provide the rights expressed in the covenant. So, states agreeing to the ICESCR have inferentially agreed to accept the right to food as a human right available to all people, and therefore have agreed to attempt to provide adequate amounts of food to their citizens.

¶19

Furthermore, the ICESCR specifically describes the responsibilities and duties that states agreeing to the Covenant ought to live up to. Articles 2(1), 11(1), and 11(2) establish the specific duties that states must uphold when accepting to ratify the Covenant, but in practice not all states have interpreted these articles as establishing specific mandates that require states to provide certain amounts of food.⁶⁴ However, these articles relating to state duties are considered by many experts to have established concrete international obligations to provide the right to food on the states that have signed the ICESCR.⁶⁵

⁶¹ See generally *id.*

⁶² ICESCR, *supra* note 57, art. 11, para. 1.

⁶³ *Id.* (indicates that states “recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing...”), Article 11, par 2 (“[R]ecognizes the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific program[is, which are needed”). [was emphasis added-mine??]

⁶⁴ *Id.* See Alston Philip Alston et al., *The Nature and Scope of States Parties’ Obligations Under the ICESCR*, 9 Hum. Rts Q. 156, 186 (1987).

⁶⁵ *Id.*

¶20 Even though the ICESCR specifies steps to make the right to food a reality, states have refused to accept the position that the ICESCR imposes an absolute duty on states to provide the right to food. Instead, states argue that the ICESCR merely imposes a duty to attempt to provide food because no specific amount of assistance is mandated by the ICESCR.⁶⁶ States advocating for this position argue that maintaining stringent regulations to ensure states provide certain levels of aid would lead to some states refusing to apply any of the ICESCR principles because states would not risk being viewed by the international community as not abiding by certain international agreements.⁶⁷ States also contend that the levels of foreign food aid that the ICESCR advocates is irrelevant given the inferior distributional powers of the countries that received the aid, and therefore the food aid does nothing to alleviate the hunger levels the ICESCR sets out to cure. However, this position could potentially undermine international commitments which they deemed much worse than having concrete mandates.⁶⁸

¶21 Under the ICESCR, it is true that states are not bound to provide minimum amounts of daily calories to its people, or to provide food to people around the world, but the Covenant does impose a duty to attempt to provide basic levels of food. The ICESCR explicitly asserts that states should take the appropriate steps to ensure the rights agreed upon within the Covenant are established, which still confers an obligation to provide some level of assistance rather than the non-committal positions that some states take.⁶⁹ Therefore, since a minimum duty exists to attempt to provide food, it is paramount that states who have signed on as signatories, or as parties, accept the international right to food. If not, state participation would be a mere mockery of the Covenant.

¶22 Unlike previous covenants relating to international human rights, the ICESCR imposes reporting requirement that parties signing onto the agreement must abide by. On May 28, 1985, the United Nations established the Committee on Economic, Social and Cultural Rights (CESCR) to directly oversee state implementation of the ICESCR.⁷⁰ The CESCR is composed of independent experts and state representatives who monitor state implementations of the ICESCR, through the reports received by each state signed onto the ICESCR.⁷¹ The CESCR Committee also publishes general comments that discuss the international status of certain issues under the ICESCR.⁷² State reports include the state's implementation of the Covenant, which is subject to compliance evaluation by the CESCR Committee.⁷³ The reports can indicate why the state is having difficulties complying with the ICESCR.⁷⁴ The conformity report process under Part IV of the

⁶⁶ David Marcus, *Famine Crimes in International Law*, 97 A.J.I.L. 245 (2003)

⁶⁷ *Id.*

⁶⁸ Alston, *supra* note 64.

⁶⁹ ICESCR, *supra* note 57, art. 11.

⁷⁰ UNECOSOC, *supra* note 49.

⁷¹ *Id.*

⁷² See Ellen Wiles, *Aspirational Principles or Enforceable Rights? The Future for Socio-Economic Rights in National Law*, 22 AM. U. INT'L REV. 35 (2006), *citing* ECOSOC, Comm. on Econ., Soc. & Cultural Rts., Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights: General Comment 12: The Right to Adequate Food, P 19, 6 U.N. Doc E/C.12/1999/5 (May 12, 1999) [hereinafter ICESCR Comment 12] (gives examples where a right to adequate food would have been violated)

⁷³ ICESCR, *supra* note 57, part IV.

⁷⁴ ICESCR, *supra* note 57, art. 17, para. 2.

ICESCR calls for submitting an initial report within two years of accepting the ICESCR, and every five years thereafter.⁷⁵ Once the Secretary General has collected the state findings they are then sent to the Economic and Social Council (ESC), which is responsible for reporting the progress of state parties regarding their observances of specific provisions under the ICESCR.⁷⁶

¶23

Besides the numerous international covenants accepting food as a basic human right, the right to food can be considered to have become apart of international human right law because of the numerous United Nations committees and conferences that have accepted the right to food and that focused on fighting hunger. After the ICESCR was established, the United Nations General Assembly continued to endorse the right to food as a human right through different UN conferences and the declarations that arose from such conferences.⁷⁷ On March 14, 1963, a United Nations Special Assembly on *Man's Right to Freedom from Hunger* issued a manifesto declaring that the freedom from hunger was an essential right to all humans, but the idea was not elaborated further.⁷⁸ In 1974, the United Nations, with the backing of the FAO, organized the World Food Conference and released a universal declaration proclaiming that "every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop their physical and mental facilities."⁷⁹ In 1984, the World Food Assembly, which is mostly comprised of nongovernmental organizations (NGOs), discussed and concluded that "the hungry millions are being denied the most basic human right—the right to food."⁸⁰

¶24

Recently, the United Nations has comprised a list of world harms that the UN perceives as being the most pervasive human rights violations in the world, which were initially discussed during the 1990 World Food Summit and were titled the *United Nations Millennium Development Goals* (MDGs).⁸¹ In 1990, the United Nations established the Millennium Development Goals (MDGs), which are a set of eight development goals that were agreed upon at several international conferences and world

⁷⁵ *Id.* (Since state are willing to report, and therefore willing to be bound by their commitment to uphold obligations created by ICESCR, then it can be inferred that by not complying to the ICESCR the Secretary General would have the power to dispel the non-complying state from the ICESCR).

⁷⁶ ICESCR, *supra* note 58, art. 18.

⁷⁷ George Kent, Children's Right to Adequate Nutrition, *citing Man's Right to Freedom From Hunger: A Report of a Special Assembly at the Headquarters of the Food and Agriculture Organization of the United Nations*, March 14, 1963 (S. Krishnaswamy, ed., 1963), *available at* <http://www.unu.edu/unupress/food/8F154e/8F154E0d.htm> (on March 14, 1963, a Special Assembly on Man's Right to Freedom from Hunger issued a manifesto declaring that the freedom from hunger was an essential right to all humans, but the idea was not elaborated further.) (in 1974, the World Food Conference released a universal declaration stating that every person had a right to be free from hunger and malnutrition).

⁷⁸ Kent, *supra* note 46, at 50.

⁷⁹ Universal Declaration on the Eradication of Hunger and Malnutrition, adopted by the World Food Conference, Rome, U.N. Doc. E/Conf. 65/20, at 1 (1974) (adopted by the World Food Conference) (the World Food Conference was convened under GA Res. 3180 (1973)) (the conference adopted the Universal Declaration on the Eradication of Hunger and Malnutrition as the official findings and agreements of the states partaking in the conference.); *see also* United Nations Food and Social Council, Preparations for the World Food Conference, E/Res/1840 (LVI) 15, May 1974 (1974).

⁸⁰ Kent, *supra* note 46, at 50-1.

⁸¹ *See* <http://www.un.org/millenniumgoals/> (for a list of the Millennium Development Goals and several documents created by the United Nations advocating for the realization of those goals).

summits in accordance with the United Nations throughout the 1990s.⁸² The first goal of the MDGs is to eradicate extreme poverty and hunger, by which the number of the world's hungry would be cut in half by 2015.⁸³ In 2000, during the Millennium Summit, all 189 UN Member States agreed to the Millennium Development Goals, which signified global recognition of a duty for state parties to provide certain basic human rights to its people and to promote certain basic human rights at an international level. These goals solidify that states are committed to accepting the right to food as an international human right and that those states are also willing to see the progressive realization of these agreements.

IV. ARGUMENT

¶25 International covenants involving the right to food have had been most successful in persuading states to provide foreign food aid, which has focused the world's attention on the right to food and international hunger levels. Since 1970, foreign food aid has assisted over 150 developing countries and transitional economies.⁸⁴ Specifically, in 2003, \$2.9 billion worth of food was distributed to 80 countries, and was donated by more than 13 different countries.⁸⁵ Foreign food aid has been the paramount international tool in combating global levels of hunger and malnutrition.⁸⁶

¶26 Foreign Food Aid has become such an important aspect of international governance that the UN has established a unit to specifically deal with food aid and food distribution. The World Food Programme (WFP) is a UN program created to assist states in providing foreign food aid by creating studies and reports regarding the success of foreign food aid, amongst other food related programs.⁸⁷ The WFP initially was a three-year experimental program that distributed foreign food aid to countries in need, but was forced to stay in operation in order to respond to several natural disasters.⁸⁸ Today, the WFP is considered the "food aid arm of the UN."⁸⁹

¶27 Despite the success of international covenants persuading states to help cure global hunger problem, the current structure of food aid programs has been ineffective in lowering international hunger levels. In order to truly live up to the intentions of international covenants purporting food to be an international human right, foreign food aid programs need to be revamped in order to meet the needs of the changing

⁸² <http://www.un-ngls.org/MDG/Q&A.htm>(for an explanation into what the Millennium Development Goals represent); *see also* <http://www.un.org/millenniumgoals/> (The Millennium Development Goals consist of eight goals which are to: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve material health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development. The Millennium Development goals also include 18 targets and 40 indicators that are found specifically within the eight development goals).

⁸³ *Id.*

⁸⁴ Sanjeev Gupta, et al., *Foreign Aid and Consumption Smoothing: Evidence From Global Foreign Aid*, FISCAL AFFAIRS DEPARTMENT OF THE INTERNATIONAL MONETARY FUND, 1 (2003).

⁸⁵ Annual Report, World Food Programme, 4 (2004).

⁸⁶ The United Nation's World Food Program history is available at:

http://www.wfp.org/aboutwfp/history/index.asp?section=1&sub_section=2

⁸⁷ *Id.*

⁸⁸ The United Nation's World Food Program Mission statement, *available at* http://www.wfp.org/aboutwfp/mission/index.asp?section=1&sub_section=6

⁸⁹ *Id.*

international community. The most logical change to the current foreign food aid programs is to move away from a top-down approach and instead provide the means to produce food to local rural communities in developing countries that depend on local food production for survival. Until recently, food production has been considered too costly for developing communities to grow high yielding harvests because such harvests previously required large amounts of costly pesticides and fertilizers to grown ample amounts of food. Today, tools are available that would allow developing countries to get around the impediments to successful harvests. Herein, the tool that would enable developing communities to grow sufficient amounts of food are genetically modified (GM) products. This section will describe the ways in which GM foods will help developing communities and suggest an innovative program to reinvigorate foreign food aid.

¶28 Current foreign aid programs are based upon top-down approaches that provide large portions of consumable crops to governments at national levels in an attempt to curb hunger in impoverished countries.⁹⁰ Top-down foreign aid programs do not attempt to alleviate long-term food deprivation issues within receiving countries, but rather attempt to provide short-term solutions to hunger and food deprivation.⁹¹ Due to the failure of foreign food aid to create long-term solutions to fighting hunger, the problem persists and in many rural developing countries the problem has become worse.⁹²

¶29 Specifically, many rural communities within Sub-Saharan Africa comprise the most food deprived communities in the world.⁹³ A report by the Food and Agriculture Organization of the United Nations (FAO) indicated that from 2000-2002 chronic hunger plagued over 852 million people worldwide and the number of people going hungry in Sub-Saharan Africa has increased by tens of millions.⁹⁴ Numerous United Nations reports have indicated that current international food aid programs fail to lower international hunger levels because those programs are short-term solutions and do not solve long-term food production issues, which is the root of hunger.⁹⁵ In order for states

⁹⁰ Foreign Aid and Consumption, *supra* note 84, at 4. (for an analysis of foreign food aid).

“Food aid is considered the main international safety net for many low-income countries. Food aid is meant to offset food shortages due to shortfalls in domestic food production or the volatility of global commodity prices. Such aid is provided both bilaterally and multilaterally, and is often drawn from food surpluses of donor countries. It is usually made available for free or on highly concessional terms. Food accounts for at least 60 percent of total expenditures among poor households in some countries, and, as such, food availability is critical for food security.”

⁹¹ Oxford International, *Food Aid or Hiding Dumping*, (Oxford Briefing Paper No. 71 2005) [hereinafter *Food Aid or Dumping*].

⁹² THE MILLENNIUM DEVELOPMENT GOALS REPORT, THE DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS OF THE UNITED NATIONS, 6, 2005 (Several areas in Latin America, North Africa, and West Africa have not witnessed an improvement in the number of people who lack sufficient amounts of food, and Sub-Saharan Africa, which already has the highest poverty rate on any region in the world, the amount of starving people between 1997 and 2002 has had an increase).

⁹³ Food and Agriculture Organization of the United Nations (FAO), *Food Supply Situation and Crop Prospects in Sub-Sahara Africa No. 2* (2005) [hereinafter *Food Supply in Sub-Saharan Africa*].

⁹⁴ <http://www.fao.org/newsroom/en/news/2004/51809/index.html> (out of 852 million that are starving 815 million of that figure came from developing countries); *see also* <http://www.un.org/millenniumgoals/> (see Millennium Development Goal number one); *FOOD SUPPLY IN SUB-SAHARAN AFRICA, supra*, note 93.

⁹⁵ *See* *The State of Food Insecurity in the World 2004: Monitoring Progress Towards the World Food Summit and Millennium Development Goals*, Food and Agriculture Organization of the United Nations (FAO), (2004); *see also* *The Millennium Development Goals 2005*; *see generally*, Pedro Sanchez. *Halving*

to attempt to solve the problem of hunger, new approaches to international food aid must be formulated that focus on long-term production issues rather than throwing large quantities of food at the problem and hoping that hunger problems magically disappear.

¶30 A solution to the inadequacies of top-down foreign food aid consists of providing high yield GM seeds to areas that have high percentages of malnutrition and hunger. This section proposes that a proactive approach that assists local agricultural production should be taken in order to decrease international hunger and to meet Millennium Development Goals. As an alternative to foreign food aid program, GM seeds technologies should be provided to rural communities within developing nations, specifically Sub-Saharan Africa, in order to allow impoverished rural communities to become self-sufficient and allow them to grow their own food by their own hands. Genetically modified agricultural seeds would greatly improve the availability of food because of their ability to yield more abundant crops and because of their additional nutritional benefits. Genetically Modified seeds are costly technology, and therefore countries need to negotiate with agribusiness in order to foster a subsidized foreign seed buying program that would allow impoverished countries to buy/obtain GM seeds to be used in rural farming.

A. *The Problem with Current Food Aid Programs*

¶31 Current foreign aid programs are based upon top-down approaches that provide large portions of consumable crops to governments at national levels in an attempt to curb hunger in impoverished countries.⁹⁶ Top-down foreign aid programs do not attempt to alleviate long-term food deprivation issues, but rather provide short-term solutions to hunger and food deprivation.⁹⁷ “Actually, food aid is often not provided at the right time, the right place, or in sufficient quantities” to solve hunger in the areas the aid is distributed.⁹⁸ Countries receiving food aid do not distribute food aid efficiently because of the lack of political infrastructure within those countries, and the lack of transportation funds required to ship food to the rural communities where a substantial number of the malnourished reside.⁹⁹ Furthermore, countries accepting aid become reliant on the next shipment of food aid to feed their people.

¶32 Top-down foreign food aid creates a circular dependence on food aid for recipient countries because current food aid programs do not improve food productivity. The idea that top-down foreign food aid is inconsequential to solving hunger issues is best illustrated by a Uganda representative of the Food and Trade and Nutrition Coalition during the 2004 World Food Day, who said, “[f]ood aid is a necessary evil; it should only be given for short periods to overcome disaster.”¹⁰⁰ The Ugandan representative was referring to the situation in Northern Uganda where people had lived for 18 years relying

Hunger- It Can Be Done, 64, UN Millennium Task Force on Hunger, (2005); *see generally*, Planting the Rights Seed: A Human Rights Perspective on Agriculture Trade and the WTO, 3D- Trade, Human Rights and the Economy: Action Update, (2005).

⁹⁶ Foreign Aid and Consumption, *supra* note 84, at 4.

⁹⁷ Oxford International, Food Aid or Hiding Dumping, (Oxford Briefing Paper No. 71 2005) [hereinafter Food Aid or Dumping].

⁹⁸ Food Aid or Dumping, *supra* note 97, at 2.

⁹⁹ Food and Trade Coalition, Dumping Food Aid: Trade Or Aid?, 6 (2006) [hereinafter Dumping Food Aid] (states that “80% of those suffering from hunger and malnutrition live in rural areas.”).

¹⁰⁰ *Id.* at 5; *see* Food Aid or Dumping, *supra* note 97, at 2 (for an in depth analysis of food aid).

on foreign aid in order to subsist, which has created a country-wide dependency on foreign aid.¹⁰¹ Throughout that period of aid, Northern Uganda did not improve agricultural production levels that would wean the country's dependency off of food aid. Instead, it has created a vicious cycle of dependency that, like many other countries in Sub-Saharan Africa, has disallowed the country from developing economically and socially, and forced the country into a position of an indeterminate state.¹⁰² Due to the failure of foreign food aid in creating long-term solutions to fighting hunger, extreme hunger levels continue to grow within Africa and other developing countries.¹⁰³

¶33 An argument could be fashioned that food aid dependency is inconsequential as long as those that are hungry receive enough food to live on. However, such an argument would fail because countries receiving aid do not have the distributional infrastructure to ensure that aid is sufficiently distributed to those who need the aid, which means food aid dependency does not lower international hunger levels.¹⁰⁴ In a speech discussing issues blocking the development of certain impoverished countries, the former UN Secretary-General, Kofi Annan has pointed out that "good governance is perhaps the single most important factor in eradicating poverty and promoting development."¹⁰⁵ Governance has become such a concern that certain international organizations have withheld aid until governments of recipient countries were able to prove that the governance would not be a hindrance to distributing the aid.¹⁰⁶

¶34 Top-down foreign food aid programs have failed to account for the fact that developing countries lack the governmental infrastructure to adequately distribute food at local levels.¹⁰⁷ The global production of food can sufficiently feed everyone on Earth,¹⁰⁸ if distributional infrastructures would allow for food to be distributed to malnourished communities. But due to transportation costs, infrastructure issues in developing countries and other economic factors, those foods will never reach the 852 million people who are starving.¹⁰⁹ Therefore, foreign food aid must be restructured in a manner that enables food aid to be provided to the communities that need such aid.

¹⁰¹ *Id.*

¹⁰² *See generally id.*

¹⁰³ The Millennium Development Goals Report, The Department of Economic and Social Affairs of the United Nations, 6, 2005 (Several areas in Latin America, North Africa, and West Africa have not witnessed an improvement in the number of people who lack sufficient amounts of food, and Sub-Saharan Africa, which already has the highest poverty rate on any region in the world, the amount of starving people between 1997 and 2002 has increased).

¹⁰⁴ *See generally* Kempe Ronald Hope, Sr., on behalf of, K. Y. Amoako, United Nations Economic Commission on Africa, The UNECA And Good Governance In Africa, Harvard International Development Conference (2003) (for an analysis of the governance issues that African states currently experience).

¹⁰⁵ *Id.* at 3.

¹⁰⁶ Regina Birner, commentary, *Governance That Matters For The Rural Poor* (2007), <http://www.ifpri.org/pubs/newsletters/ifpriforum/200603/IF14governance.asp> (last visited April 22, 2007); *see also* UN Jeffery Sachs, UN Millennium Development Project, *Investing in Development: A practical Plan To Achieve The Millennium Development Goals*, 137 (2005), *available at* <http://www.unmillenniumproject.org/documents/MainReportChapter10-lowres.pdf>.

¹⁰⁷ *Id.*; *see* Stefania Bianchi, *G8 Summit: GM Food Not A 'Miracle Solution' To Africa's Hunger*, IPS-Inter Press Service, July 1, 2005.

¹⁰⁸ Frances Moore Lappa et al., Institution for Food and Development Policy, *12 Myths about Hunger*, (Grove/Atlantic and Food First Books, 1998), *available at*

<http://www.foodfirst.org/pubs/backgrdrs/1998/s98v5n3.html> (website provides a summary of the twelve myths. See Myth 1 for the contention that enough food currently exists to feed everyone worldwide).

¹⁰⁹ *See* Dumping Food Aid, *supra* note 99; *see* World Health Organization, *Modern Food Biotechnology, Human Health and Development: An Evidence Based Study*, 34 (2005).

¶35 The problem with current foreign food aid programs does not merely concern accessibility to food, but the problem also concerns the inability of top-down foreign food aid programs to enable impoverished countries to become self sufficient.¹¹⁰ Logically, food security cannot be realized through top-down foreign aid because aid merely provides a momentary fix rather than providing for a long-term solution to curbing hunger. Rather foreign food aid programs ought to provide aid in a manner that fixes inefficiencies causing a lack of food within receiving countries. George Kent in his book, *Freedom from Want*, argues that “[i]n any well [sic] well-structured society, the objective is to move toward conditions under which all people can provide for themselves.”¹¹¹ Kent presents a poignant argument which infers that the focus of foreign aid must focus on solving long-term problems affecting impoverished countries. In the case of food aid, programs ought to be focused on solving the deficiencies that disallow countries from feeding the people within those countries.

B. A Practical Solution for the Deficiencies of Current Top-Down Foreign Food Aid Programs

¶36 In order to lower international hunger levels, a major tenure of food aid ought to focus on providing local communities with tools to create their own food.¹¹² Statistically, over two billion people living in rural areas rely on local agriculture to subsist on, which comprises 70% of the world’s poor.¹¹³ Also, eighty percent of those suffering from “hunger and malnutrition live in rural areas... [and] only 20% live in towns and cities.”¹¹⁴ In particular, three-quarters of Africa’s poor live in rural areas, and therefore if the international community’s goal is to cut hunger in half by 2010, then a community-based approach focusing on lowering food deprivation in rural farming communities would be the most efficient way to combat global hunger levels.¹¹⁵

¶37 Since top-down foreign food aid fails due to severe distribution problems, once the aid is provided to national governments, the only way to begin lowering international hunger levels is to establish programs that would increase food production at local levels within developing countries.¹¹⁶ More specifically, international responses to hunger must contain people-centered approaches that provide relief at the local level, rather than solely relying on nationally-based aid programs that have failed to decrease the international level of hunger.¹¹⁷ A report by the 2005 UN Millennium Project states that

¹¹⁰ See generally *id.*

¹¹¹ Kent, *supra* note 46, at 46.

¹¹² See generally, Padro Sanchez et. al, UN Millennium Project 2005: A Strategic Approach To Halving Hunger, (2005) [hereinafter A Strategic Approach To Halving Hunger].

¹¹³ *Id.*; see also Dumping Food Aid, *supra* note 99, at 6.

¹¹⁴ Dumping Food Aid, *supra* note 99, at 6.

¹¹⁵ See The UN Millennium Development Goals, available at <http://www.un.org/millenniumgoals/> (see Goal number one).

¹¹⁶ See Edgar Owens, The Future of Freedom in the Developing World: Economic Development as Political Reform, 51 (1987) (“creating economic and social rights for the world’s small farmers, is the first step in enabling countries to feed their own people. Where these rights have been created and small farmers have access to production resources, public organization, and law, very high farm production has been achieved.”).

¹¹⁷ Padro Sanchez, *supra* note 112, at 64 (for an in-depth analysis of the benefits of adopting a people-centered approach to combating hunger, globally). A people-based approach refers to the notion of making people self-sufficient through the ability to grow their own food. See also 3D (Trade, Human Rights,

“[t]he design of national hunger reduction strategies, with local communities at the center of the design and implementation, will provide the best means of enabling local people to identify and deal with local governance challenges.”¹¹⁸

¶38

Unlike top-down food aid that is distributed at national levels, people-centered local aid is capable of providing local governments with tools to solve long-term hunger issues in those particular communities.¹¹⁹ Also, Edgar Owens in his book, *The Future of Freedom in the Developing World: Economic Development as Political Reform*, indicates that:

“[c]reating economic and social rights for the world’s small farmers, is the first step in enabling countries to feed their own people. Where these rights have been created and small farmers have access to production resources, public organizations, and law, very high farm productivity has been achieved.”¹²⁰

By adopting a people-centered approach, local governments are able to allocate their resources in a manner that would best benefit their community, which, in theory, would be the most efficient way of improving food deficiencies.¹²¹

¶39

The Green Revolution proved that technological advances have the potential of exponentially increasing global food production.¹²² In Sub-Saharan Africa, the lack of Green Revolution technologies coupled with the region’s harsh climate and soil conditions has created an unfavorable food-producing environment.¹²³ However, agricultural technologies have been able to overcome similar conditions plaguing

Equitable Economy), *Planting the Rights Seed: A Human Rights Perspective on Agriculture Trade and the WTO*, 1, (2005) [hereinafter *Planting the Right Seed*] (the report by 3D describes the types of communities and people that make up the hungry in Africa and other countries. “Many of these are small-scale, subsistence farmers, and the vast majority produce food for local consumption. Agriculture is thus an activity of central importance.), see Food and Agriculture Organization (FAO), *Some Issues Relating to Food Security in the Context of the WTO Negotiations on Agriculture*, (2001). (arguing that rural farming communities ought to be improved in order to lower the national hunger level. “Developing the farm sector, particularly in countries where a high percentage of the population is engaged in agriculture, is an effective way to generate employment and reduce poverty, as well as to increase levels of health, nutrition and education.”).

¹¹⁸ *Id.*

¹¹⁹ See generally *id.*

¹²⁰ Owens, *supra* note 116 at 51; see generally Hernando De Soto, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*, (2000).

¹²¹ *Id.*

¹²² See Michael R. Taylor & Jerry Cayford, *American Patent Policy, Biotechnology, and African Agriculture: The Case for Policy Change*, 17 Harv. J. Law & Tec 321, 328 (2004), citing Gordon Conway, *The Doubly Green Revolution: Food For All In the 21st Century* (1999). (“[t]he Green Revolution promoted the use of irrigation, fertilizers, pesticides, high-yield varieties, and the greater efficiencies of monoculture and large farm size. The results included dramatic increases in productivity, but also fertilizer and pesticide runoff into surface waters, greater soil erosion, and other economic costs.”).

¹²³ *Id.* at 329, citing Andersen et al., *World Food Prospects: Critical Issues For the Twenty-First Century* (1999), available at <http://www.ifpri.org/pubs/fpr/fpr29.pdf> (Taylor indicates that natural resources, productive farming methods, and market outlets for surplus production are all necessary elements of a successful agricultural system. Taylor goes onto describe the conditions affecting developing countries’ agricultural systems.)

agricultural systems in other countries, which have created workable food-producing environments.¹²⁴

¶40 The most logical solution to solve for the inefficiencies that plague Africa's farming system is to provide biotechnology, in the form of GM agricultural seeds, to rural communities throughout Sub-Saharan Africa.¹²⁵ The recent biotechnological advancements in GM seeds allow rural farmers to plant GM seeds without becoming reliant on pesticides and other farming additives that would substantially increase production costs of agricultural goods, which would make agricultural production too costly to engage in.¹²⁶ By developing traits within GM seeds for drought resistance, pest control, a lack of nutritional value, disease resistance, and improved yields, GM seeds enable farmers in Africa to grow crops that can withstand the harsh environmental of Africa.¹²⁷

¶41 GM agricultural seeds have several traits that make them highly advantageous to developing rural communities. The advantages that GM seeds bring to rural farming communities can be divided into production advantages and nutritional advantages. Production advantages include improvements in the planting process of GM crops such as: higher yields per acre; less fertilizers, herbicides, and insecticides required to grow fertile plants; drought resistant seeds; and significantly less amounts of water to grow crops. These traits improve rural farmers' ability to produce successful crops.¹²⁸ Increased nutritional value is another advantage of GM seeds. Genetically Modified seeds can be designed to reduce post harvest losses; add nutritional value not otherwise found in such crops; and add vaccine delivery traits to combat disease.¹²⁹

¶42 Genetically modified agricultural seeds can be utilized to solve several problems that contribute to the issue of hunger in developing countries. Firstly, GM seed technologies would improve crop yield production, in general, because GM seeds produce crops with higher yields per acre. Higher crop yields produce higher gross amounts of food that would then be available to the community for consumption, which is a positive step towards lowering malnutrition within a community. According to the UN Millennium Project Task Force on Hunger, statistics indicate that the number of people undernourished falls when food production rises, and "[r]aising agricultural productivity where yields are low has the potential to reduce hunger and poverty by directly increasing access to food for producer households and communities."¹³⁰

¶43 Secondly, GM technologies allow for foods to be grown with less water than conventional agricultural seeds, which allows countries with water scarcity issues to use

¹²⁴ *Id.*

¹²⁵ *Supra* Section II(For an explanation of GM agricultural seeds).

¹²⁶ FAO, Food Supply Situation and Crop Prospects in Sub-Sahara Africa, 1(2004), *available at* <ftp://ftp.fao.org/docrep/fao/007/j3766e/j3766e00.pdf>. ("The potential uses of modern biotechnology in agriculture includes: increasing yields while reducing inputs of fertilizers, herbicides and insecticides; conferring drought- or salt-tolerance on crop plants; increasing shelf-life; reducing post harvest losses; increasing the nutrient content of produce; and vaccine delivery.")

¹²⁷ *Id.*; *see* Taylor, *supra* note 122 at 330.

¹²⁸ Leading Scientists Debate the Merits of Biotechnology www.foodfirst.org/media/news/2000/biotechdebate.html; *see also* Peter Rosset, Anatomy of a 'Gene Spill: Do We Really Need Genetically Engineered Food?', FOOD FIRST BACKGROUNDER, vol. 6, no. 4 (2000), *available at* <http://www.foodfirst.org/pubs/backgrdrs/2000/f00v6n4.html>.

¹²⁹ *Id.*

¹³⁰ Pedro Sanchez. *Halving Hunger- It Can Be Done*, UN Millennium Task Force on Hunger, 104 (2005).

water elsewhere.¹³¹ CGIAR Chairman Ismail Serageldin, chairman of the World Commission on Water, said “[t]he shortage of fresh water is looming as the most serious obstacle to food security, poverty reduction, and protection of the environment [.]”¹³² Providing GM technologies to rural communities would remove some of the strain that those communities would otherwise feel when deciding between whether to water crops for food, or using water for other community-based issues.

¶44

Thirdly, GM technologies allow for genes to be added to foods that increase their nutritional value, which helps combat malnutrition issues within rural communities.¹³³ The majority of the world’s poor live in communities that have inadequate amounts of proteins, calories, and micronutrients within their food sources.¹³⁴ Inadequate nutritional levels has mostly affected children who because of vitamin A deficiencies in their diets are falling victim to serious health risks, such as irreversible blindness.¹³⁵ The diets of individuals residing in developing nations typically consist of one or two staple crops, which leads to those individuals not receiving the full spectrum of nutrients their bodies need.¹³⁶ Certain NGOs have declared that GM crops “can also be modified to included

¹³¹ Shah, *supra* note 2 at 21. The majority of developing countries facing food security issues are also faced with severe water crises.

¹³² *Id.* at 9 (“Given the complex and interlinked components of the overall challenge of feeding the world in the 21st century, it is clear that solutions that deal only with one part—with crop productivity, for instance, or land use, water conservation, and forest production—will not be sufficient. The issues are connected and must be dealt with as an interlocking, holistic system.”).

¹³³ PETER PRINGLE, FOOD INC., 28, (2003) (“Despite big improvements in global food supplies since the ‘60’s, more than two billion people, especially women and children, lacked sufficient vitamins and minerals in their diets, particularly vitamin A and iron.”); Kent, *supra* note 46 at 8 (“About 243 million adults in developing countries are severely undernourished, judged by a body mass index of less than 17 kg/m. This type of under nutrition may impair work capacity and lower resistance to infection.”).

¹³⁴ SUSTAIN, SHARING FOOD TECHNOLOGY TO IMPROVE NUTRITION, <http://sustaintech.org/technology/index.htm>; *see* INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, *What Meets The Eye: Images of Rural Poverty*, available at <http://www.ifad.org/events/ecosoc/book/book.htm> (groups living in communities with inadequate micronutrients account for one-fifth of the world’s population who suffer from disease and death).

¹³⁵ DEVINDER SHARMA, THE GREAT TRADE ROBBERY: WORLD HUNGER AND THE MYTHS OF INDUSTRIAL AGRICULTURE, GENE TRADERS: BIOTECHNOLOGY, WORLD TRADE, AND THE GLOBALIZATION OF HUNGER (2004), *citing* Sustainable Agriculture in the New Millennium: The Impact of Biotechnology on Developing Countries, Dr. Adrian Dubock, Brussels, May 28-31, 2000. (“[T]he levels of expression of pro-vitamin A that inventors were aiming at, and have achieved, are sufficient to provide the minimum level of pro-vitamin A deficiency affecting 124 million children in 26 countries.” “In 1990... several [vitamin A] aid programs were launched to distribute vitamin A capsules, to add iron to wheat flour, and to educate poor people about their diet. But Distribution was uneven and often impossible in remote areas. The UN’s Food and Agriculture Organization, the World Health Organization, and leading food research groups suggested that the real solution was to increase the amount of the missing nutrients in the staple crops.”) http://sustaintech.org/technology/micro_fort.htm (“Vitamins, as well as minerals such as iron, zinc and iodine play crucial roles in regulating human growth, physical and cognitive development, immune response and reproduction. Though needed by the body in only minute amounts, these micronutrients are critical to well-being and even survival, especially during childhood, and for women, the childbearing years. Chronic micronutrient deficiencies resulting from inadequate diets can seriously compromise physical and mental health, sometimes irreversibly.”); *see also* Bren, Linda, *Genetic Engineering: The Future of Foods?*, FDA CONSUMER MAGAZINE, November/December 2003, available at http://fda.gov/fdac/features/2003/603_food.html (malnutrition can also lead to lower birth rates for babies, weaker immune systems so that the AIDS virus can take form, and even conflict between hungry communities searching for food).

¹³⁶ Kent, *supra* note 46 (even if these foods were eaten three times a day, they would not provide adequate nutritional value and consequently people subsiding on these foods do become malnourished).

vitamins and nutrients that are severely lacking in the diets of poor people.”¹³⁷ Providing GM seeds to rural communities would help minimize the mortality rate caused by malnutrition and hunger because GM seeds have the capability of splicing nutrients, into the seeds, that would not otherwise be found in such foods. The above advantages present compelling reasons why food aid ought to focus on providing GM seeds to rural farming communities.

¶45 Twenty years ago, seeds from the Green Revolution would require large amounts of fertilizers, pesticides, and other additives to ensure high yield crops were realized, which dramatically increased the price of food production. Today, GM seed technologies allow for successful harvests to be produced in unfavorable climates without relying on large amounts of fertilizer and other additives that increase the cost to produce high-yield crops.¹³⁸ Many agricultural experts agree that providing biotechnology to rural African communities would increase the amount of food available for consumption at local levels, and thereby create food security for areas that typically experience a lack of food.¹³⁹ Also, several NGOs have concluded that providing GM seeds to rural farming communities would help to solving hunger problems in those areas.¹⁴⁰ Since international authorities on the subject of deterring hunger believe that providing GM products to local rural communities would be the best way to combat hunger, then international aid policies should initiate programs to provide these technologies to the rural communities in need.

C. Alternative Suggestions to Curb International Hunger: The GM Seeds for Africa Plan

¶46 Since the end of WWII, the international community has placed an emphasis on combating international hunger, but such attempts have failed to lower international

¹³⁷ FOOD FIRST, FOOD AID IN THE NEW MILLENNIUM: GENETICALLY ENGINEERED FOOD AND FOREIGN ASSISTANCE, 3 (2000), available at <http://www.foodfirst.org/node/304> (see Inappropriate Response to Hunger section).

¹³⁸ PLANTING THE RIGHT SEED, *supra* 119 (“Many of these are small-scale, subsistence farmers, and the vast majority produce food for local consumption. Agriculture is thus an activity of central importance.”), see FAO, SOME ISSUES RELATING TO FOOD SECURITY IN THE CONTEXT OF THE WTO NEGOTIATIONS ON AGRICULTURE, (2001). (“Developing the farm sector, particularly in countries where a high percentage of the population is engaged in agriculture, is an effective way to generate employment and reduce poverty, as well as to increase levels of health, nutrition and education.”)

¹³⁹ Taylor, *supra* note 122, at 329-30; Sarah A. Cline & Mark W. Rosegrant, commentary, *Global Food Security: Challenges and Policies*, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, December 12, 2003; see generally Shah, *supra* note 2, at 21 ; Louise O. Fresco, Food and Agriculture Organization, Genetically Modified Organisms in Food and Agriculture: Where Are We? Where Are We Going?, Keynote Address Conference on Crop and Forest Biotechnology in the Future, Sweden September 16-18, 2001.

¹⁴⁰ *Research and Impact: CGIAR & Agricultural Biotechnology* (2004), available at <http://www.cgiar.org/impact/agribiotech.html> (the Consultative Group on International Agricultural Research (CGIAR) is an NGO that advocates for the use of GM products in Africa. The organization contends that GM products are critical to improving food availability for rural agricultural communities in Africa. The organization’s main goal is to make agricultural production for developing countries more efficient through providing those countries with genetic and biotechnologies, which would produce higher yields and allow for improved agricultural managerial practices. Genes can be added to GM products that provide consumers antibodies to deadly diseases that are present in third world nations); see generally <http://www.fao.org/newsroom/en/news/2004/51809/index.html> (arguing that agricultural reform ought to focus on providing local agriculture with the means to improve food production. In 2004, the World Food Summit recommended that countries improve agriculture and rural development at local levels because over half of the starving people in the world rely on local agriculture for their source of food).

hunger levels. More recently, the United Nations' Millennium Development Goals have made eradicating poverty and hunger its number one goal, and has shifted a majority of the organization's efforts to meeting this goal.¹⁴¹ The United Nation's efforts to curb hunger are valiant, but even Kofi Annan, the former UN Secretary-General, recognizes that creative alternatives to combating hunger must be considered if the goal of eradicating hunger is to be realized: "[w]e will have time to reach the Millennium Development Goals.... only if we break with business as usual. We cannot win overnight. Success will require sustained action across the entire decade between now and the deadline."¹⁴² Business as usual consists of maintaining top-down food aid programs and hoping that developing nations somehow find the capability of distributing food to those in need, and hoping that developing countries can somehow reverse their agricultural production fortunes.

¶47 One suggestion that would get away from "business as usual" and attempt an innovative approach to halving hunger is a formulation of creative partnerships with agribusiness corporations to provide GM agricultural seeds to Sub-Saharan African rural farming communities. A plan between states and agribusiness could drastically decrease the number of people starving in Sub-Saharan Africa by providing them with the means to grow their own food, which would raise food availability throughout Sub-Saharan African countries.¹⁴³ This type of plan would consist of international organizations and countries coming together and bartering a deal with agribusiness corporations, who produce GM seeds, and creating a subsidized seed program called the "GM Seeds for Africa" plan.¹⁴⁴ Specifically, the "GM Seeds for Africa" plan consists of a partnership between states and agribusiness where states purchase GM seeds from agribusiness (seed producers) at a price lower than the market price for such seeds, and states distribute GM seeds to rural communities to use in their regular yearly harvest.

¶48 Practically, this type of plan would be the most efficient way to provide rural communities with the means to produce food for survival. Rural communities comprise the majority of Africa's hungry, so providing those communities with tools that can realistically help them grow food seems to be directly targeting the issue of access to food within those regions. The "GM for Africa" plan would provide numerous production and nutritional advantages to Sub-Saharan African countries that those countries would not otherwise be able to afford.¹⁴⁵ Unlike the impractical top-down

¹⁴¹ See <http://www.un.org/millenniumgoals/index.html> (this is the UN's Millennium Development Goals website that lists the goals and contains several Millennium Development Goals reports by different arms of the UN. Note the various organizations and committees the United Nations has created to produce reports on meeting the goals and obstacles that might disallow such goals to be met. The goal concerning eradicating poverty and hunger is located on the left side of the webpage and is under the number one goal). (last visited April 25, 2007).

¹⁴² <http://www.un.org/millenniumgoals/index.html> (last visited April 25, 2007).

¹⁴³ See Section 2 (for reasons why GM foods would benefit Sub-Saharan African countries and the rural communities within those countries).

¹⁴⁴ For the purposes of this comment, the program advocated will be dubbed the "GM Seeds For Africa" program, or plan.

¹⁴⁵ *Id.* This paper will not venture into the realm of international patents and several international exceptions to patents when dealing with developing nations. For more information on this subject see Michael R. Taylor, Jerry Cayford, *Symposium: Biotechnology Patents and African Food Security: Aligning America's Patent Policies and International Development Interests*, 6 Minn. J.L. Sci. & Tech. 277 (2004); see also Robert E. Robertson, *Information on Pricing of Genetically Modified Seeds in the United States and Argentina*, Before the Comm. on Agric., House of Representatives June 29, 2000 (for a background

foreign food aid programs that have not succeeded in lowering international hunger levels because they fail to feed the world's hungry, the "GM Seeds for Africa" plan would pickup where top-down food aid programs failed by: (1) increasing crop production, which would provide the communities most vulnerable to hunger increased amounts of food; and (2) enabling rural farming communities the means to produce their own food on a yearly basis.

¶49 Leading academics in the research field have advocated for programs similar to the "GM Seeds for Africa" plan. Michael R. Taylor and Jerry Cayford argue that the most logical way to provide innovative seed technology to rural farmers in Africa would be through a combined public and private cooperation channel.¹⁴⁶ Taylor and Cayford recognize that the private sector does not have the economic incentive to provide GM products to a group that lacks strong buying power and the public sector lacks the patent rights and the means to produce necessary GM products for rural farmers in developing nations.¹⁴⁷

¶50 This proposition seemingly aligns the interests of both states¹⁴⁸ and agribusiness. Firstly, states benefit because the program gets them closer to their goals of eradicating hunger by 2015 because GM seeds would increase the amount of food available for production in those states. Secondly, agribusiness would be able to develop seeds for a region that it would not otherwise have an economic incentive to invest into, and in turn put more pressure on European countries to open their borders to GM seeds and foods, which is a market that agribusiness has attempted to gain access to for some time.¹⁴⁹

¶51 History indicates that the "GM Seeds for Africa" plan can be done. The "GM Seeds for Africa" plan is similar to programs that provided AIDS medication to Africa at extremely low prices, in which governments and international organizations lobbied pharmaceutical companies to provide expensive lifesaving AIDS medication to African countries.¹⁵⁰ In attempting to curb international hunger through creative solutions, states

and reasons why African farmers cannot afford GM agricultural seeds and the other patent issues surrounding GM seeds) (Farmers within the United States are not allowed to reuse GM seeds due to patent concerns, and also have to pay a patent fee \$6.50 per bag (year 2000 fee) in order to grow the crops); *See also*, DEVINDER SHARMA, THE GREAT TRADE ROBBERY: WORLD HUNGER AND THE MYTHS OF INDUSTRIAL AGRICULTURE, GENE TRADERS: BIOTECHNOLOGY, WORLD TRADE, AND THE GLOBALIZATION OF HUNGER, 68 (2004) (Biotechnology companies do not allow purchasers of GM seeds to re-use those seeds for the next planting season, but instead farmers must purchase entirely new seeds); *see also* FAO, SOME ISSUES RELATING TO FOOD SECURITY IN THE CONTEXT OF THE WTO NEGOTIATIONS ON AGRICULTURE, (2001). (arguing that rural farming communities ought to be improved in order to lower the national hunger level. "Developing the farm sector, particularly in countries where a high percentage of the population is engaged in agriculture, is an effective way to generate employment and reduce poverty, as well as to increase levels of health, nutrition and education."). *See generally* Haley Stein, (Comment) *Intellectual Property and Genetically Modified Seeds: The United States, Trade, and The Developing World*, 3 NW. J. TECH. & INTELL. PROP. 160 (2005) (for an analysis of intellectual property rights of genetically modified agricultural seeds and the US policy regarding such property rights).

¹⁴⁶ Taylor & Cayford, *supra* note 122, at 23.

¹⁴⁷ *Id.* at 336 ("[i]f the benefits of cutting-edge advances in seed technology based on modern biotechnology are to reach the vast majority of African farmers, they will have to be provided for the foreseeable future primarily through public and public-private cooperative channels.").

¹⁴⁸ "States" refers to the countries and international organizations interested in meeting the UN Millennium Development Goals, and who wish to curb international hunger.

¹⁴⁹ Also, biotechnology companies have been attempting to break into new markets within developing countries in order to provide the European Union with more reasons to open its borders to GM seeds and produce.

¹⁵⁰ *See* Raymond W. Copson, FOREIGN AFFAIRS: DEFENSE, AND TRADE DIVISION, *AIDS in Africa*,

should consider the problem of AIDS in Africa and how the United Nations brokered a deal with the pharmaceutical industry, which made AIDS vaccines affordable for developing nations.¹⁵¹ In 1999, an international debate over patent and trademark rights for AIDS vaccines took shape, which parallels the current issue of hunger and the suggestion of providing GM seeds to developing countries. During the height of the AIDS epidemic, pharmaceutical companies were not willing to donate AIDS vaccines to developing nations, did not want to lower prices for the drugs, nor did the companies allow foreign companies to produce generic drugs to treat AIDS victims.¹⁵²

¶52 In 2001, the United Nations negotiated an agreement with pharmaceutical companies that provided AIDS medicines for African countries at reasonable prices. The deal brokered by the United Nations called for pharmaceutical companies to slash prices for AIDS vaccines in Africa by as much as 70%, and also allowed for pharmaceutical companies that did not have patent rights to certain AIDS drugs to produce those drugs under a generic label, which would be distributed strictly to African countries.¹⁵³ The outcome of the deal resulted in significant amounts of AIDS vaccines becoming available in Africa and several generic brands that allow the vaccines to be affordable to people who otherwise would not be able to afford them.¹⁵⁴ Furthermore, the successful example of lowering the costs of AIDS medicines indicates that strategic partnerships, such as the “GM Seeds for Africa” plan have a realistic chance of being carried out, which would help curb hunger levels in one of the most pervasively malnourished areas in the world. Therefore, if international organizations are truly committed to move from making commitments to taking steps to end hunger, then the “GM Seeds for Africa” plan ought to be seriously considered.

V. CONCLUSION

¶53 The international community’s goal of eradicating international hunger will never be realized if the current foreign food aid structure is maintained. No longer can the

CONGRESSIONAL RESEARCH SERVICE, June 29, 2005 (provides a thorough background on the issue of AIDS in Africa and pertains to this paper by giving the reader an understanding as to how the subsidized AIDS vaccines deal was created and how it helped to solve the AIDS in Africa problem).

¹⁵¹ See *id.* (provides thorough background on the issue of AIDS in Africa and pertains to this paper by giving the reader an understanding as to how the issue of providing AIDS vaccines to solve for the issue of AIDS in Africa can be compared to the lack of food in developing nations and why GM products should be provided to those regions).

¹⁵² <http://www.globalissues.org/TradeRelated/Corporations/AIDS.asp> (American drug manufacturers went so far as to lobby the US government to threaten South Africa with trade sanctions for violating pharmaceutical trade patents); see also THE ASSOCIATED PRESS, *Pharmaceutical Company to Slash Cost of AIDS Drugs in Africa*, May 11, 2000 <http://archives.cnn.com/2000/WORLD/africa/05/11/aids.africa/> (The high costs of the vaccines were considered the main barrier in responding to the AIDS epidemic).

¹⁵³ *Id.*; see also, Leon Spencer, *AIDS in Africa: Affordable Access to Quality Medicine*, AFRICA ADVOCACY PUBLIC POLICY NEWSLETTER, Number 2, November 2001 (Shortly after May 2001, generic manufacturers began to supply AIDS vaccines at a fraction of the price that conglomerate pharmaceutical companies could provide the same product at).

¹⁵⁴ John Donnelly, *Africa May Skirt Patent to Get Drugs*, THE BOSTON GLOBE, August 25, 2001 (“[G]eneric drug manufacturers[] started a freefall in prices for AIDS medication in February by agreeing to sell a combination of AIDS drugs for \$350, while large pharmaceutical companies are offering \$1,000 combinations to the developing world. In the United States such medication costs \$10,000 and \$15,000 per year.”); see also Andrew Clark & Julian Borger, *Cheaper Drugs for Africa*, THE GUARDIAN, March 15, 2001, available at <http://www.guardian.co.uk/print/0,3858,4152510-106925,00.html>.

international community accept food dumping as a form of food aid that will eradicate hunger. If decreasing international hunger levels is truly the international community's goal, then food aid must enable recipient countries and communities to become self-sufficient. Since a vast majority of hungry and malnourished people throughout the world rely on local rural agriculture, improving the food producing ability within those communities would vastly increase the availability of food within those regions, and therefore directly combat international hunger levels. The matter of global hunger is not an easy problem to solve, but in order to put a dent in the staggering numbers of people starving international leaders must make changes to the current stagnant top-down foreign food aid programs.

¶54

Therefore, plans like the "GM Seeds for Africa" plan ought to be closely considered.¹⁵⁵ The ability of GM seeds to improve food growth in rural developing communities will help fill the void left by traditional top-down food aid programs, and will enable rural communities to finally become self sufficient. Lastly, if the international community is serious about decreasing global hunger, then alternatives to the current foreign food aid programs must be fashioned. If not, then millions of people will continue to suffer from hunger and die of starvation.

¹⁵⁵ See section IV subsection B for the advantages of GM crops.