



8-2005

Human Rights, Exploitation, and Genetic Use Restriction Technology: Sowing the Seeds of Reason in the Field of the Terminator Debate.

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I am submitting herewith a thesis written by Keith A. Bustos entitled "Human Rights, Exploitation, and Genetic Use Restriction Technology: Sowing the Seeds of Reason in the Field of the Terminator Debate.." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Philosophy.

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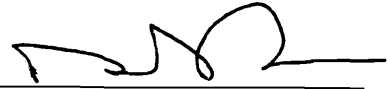
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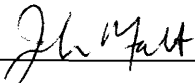
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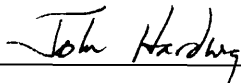


Denis G. Arnold, Major Professor

We have read this thesis
and recommend it's acceptance:



John Nolt, Committee Member



John Hardwig, Committee Member

Accepted for the Council:



Vice Chancellor and
Dean of Graduate Studies

**Human Rights, Exploitation, and Genetic Use Restriction Technology:
Sowing the Seeds of Reason in the Field of the Terminator Debate**

A thesis presented for the Master of Arts Degree
The University of Tennessee, Knoxville

Keith A. Bustos
August 2005

Abstract

The current debate concerning genetically modified (GM) crops is primarily focused on the negative consequences that the production and consumption of GM foods could have on people and the environment. Adding to the list of concerns is the multinational agrochemical corporations' plan to implement GURTs (Genetic Use Restriction Technologies) to prohibit the unauthorized use of certain genetically modified plant varieties. Several activist groups perceive the potential implementation of GURTs to be a threat to resource-poor farmers since this technology (which the activists call Terminator Technology) may be used to wrongfully exploit resource-poor farmers in the name of economic gain. In this thesis, I argue that multinational agrochemical corporations will not necessarily be infringing upon the rights of resource-poor farmers nor will they be wrongfully exploiting such farmers through the implementation of GURTs. Given that the primary targets for implementing GURTs are currently modified plant varieties, and most resource-poor farmers are unable to afford GM seeds, multinational agrochemical corporations will not have the opportunity to form a relation with these farmers and therefore would not be able to use them as a mere means to maximizing seed industry profits. I conclude that the implementation of GURTs may be construed as immoral on some grounds, but it is not wrongfully exploitative.

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Chapter 1: Introduction

For centuries, humans have domesticated certain plant varieties for their preferable nutritional and palatable characteristics. In order to grow crops that can produce such desirable characteristics farmers have selected certain plants as prototypical varieties, which they then bred with similar varieties to perfect a particular desirable trait; this gave rise to the art of plant breeding. Thanks to Gregor Mendel's experiments with pea plants, plant breeders were able to apply their new understanding of plant genetics to traditional methods of crop production. During the past few decades, scientists have made great strides in understanding and manipulating the genomes of various plant varieties. Such advances in the field of genetics have allowed plant breeders to take portions of one plant genome and splice them into the genome of another plant. This technology has come to be known as genetic modification (GM). The commercial application of GM technology in the agricultural industry has been plagued with negative publicity due to the artificial means by which plant genomes are altered.

Currently, GM crops are touted as being both a blessing and a curse. On the one side, GM crops are a blessing because they may be used to produce more food in barren lands thereby making food available where it is needed the most. For instance, some GM crops are being designed to grow in severe conditions, making certain plant varieties drought resistant, which permit particular crops to be grown in more arid regions. Another potential benefit of using GM crops is that specific plant varieties such as Bt Corn and Roundup Ready[®] Soybeans have been engineered, so their manufacturers claim, to require little to no chemical applications since the plant either produces its own pesticides (in the case of Bt Corn) or is resistant to herbicides (in the case of Roundup Ready[®] Soybeans).¹ On the other side, GM crops have been thought to be a curse since genetically modified organisms (GMOs) have the potential to wreak havoc on the health of the natural environment and the human consumers of GM products. With regard to the potential negative impacts on the natural environment, some argue that GM plants may mate with wild relatives to create super weeds that become uncontrollable; may lead to the extinction of certain species; or may cause a decrease in biodiversity. Such scenarios could result from GM pollen drifting to neighboring crops or into the natural landscape (in both instances) potentially fertilize plant varieties that are closely related to the GM variety.

¹ Claim such as these have been made by agrochemical corporations and have been contested by many activist groups opposing GMOs. Bt plant varieties appear to obviously require little to no chemical application since the plant produces its own pesticides. On the other hand, Roundup Ready[®] plant varieties do not seem to necessarily require less herbicide application. Some GMO opponents contend that the latter plant varieties may require less discriminant application of herbicides since the crops are resistant, resulting in a potential increase in the amount of chemical applied to a particular crop. Such an increase in herbicide application may negatively impact the health of the local environment. Even though it is true that Roundup Ready[®] plant varieties would require less discriminant application of herbicides, it does not necessarily mean that more herbicide will be applied to the crop. It would just not be profitable for a particular farmer to both purchase Roundup Ready[®] varieties (which will probably be more expensive than traditional plant varieties) and increase herbicide application. So, merely from an economic perspective, Roundup Ready[®] plant varieties will not necessarily result in an increase in herbicide application.

In order to guard against or to minimize such genetic pollution the scientific community has been involved in the research and development of biological confinement methods for controlling the dispersal of transgenes.² One such biological confinement method known as the seed sterility method has gained a nefarious reputation over the past six years. This bioconfinement method allows seeds to grow into productive plants, but the seeds produced are sterile. Seed sterility has also been developed for use in commercial seed markets as a method for restricting the use of particular plant varieties. When used for such commercial applications, this technology is known as a form of genetic use restriction technology (GURTs). The reason that this technology has received much negative publicity is that some NGOs and activist groups believe that it has been developed as a means for exploiting resource-poor farmers in developing countries.

Many NGOs and activist groups throughout the world (mainly in the US, Canada, and the UK) have been very outspoken concerning the “immorality” of GURTs and have demonized this technology by tagging it “Terminator Technology”. They argue (as we shall soon see) that Terminator Technology is immoral because it threatens to infringe upon the rights of resource-poor farmers (mainly in developing countries) by denying them the ability to save the seeds of their harvests. The NGO literature opposing the commercial use of GURTs makes, however, little reference to scientific literature weighing the potential positive and negative environmental and socioeconomic consequences of this novel technology. I suspect the reason for this lack of scientific support is not that the NGOs have failed to do their research or that they have ignored some body of scientific literature. Instead, it is probably due to the fact that there is very little published on the science behind Terminator Technology other than what is found in the patent description. Given that little is known about the biological mechanism that governs Terminator Technology, it seems precipitous to conclude that the implementation of this technology will actually have negative environmental and socioeconomic consequences that many NGOs and activist groups adamantly believe to be inevitable.

The intent of this thesis is to take an objective look at the claims made by NGOs and activists regarding the potential implementation of Terminator Technology.³ Stated concisely, the NGOs’ main objection to Terminator Technology is that it promises to grant multinational agrochemical corporations (MACs) a disproportionately large amount of power over resource-poor farmers and thereby allowing the MACs to infringe upon the rights of these farmers and to effectively exploit them in the pursuit of economic gain. Even though there are many other ways that the use of GURTs can be construed as wrong, I narrowly intend to argue that MACs using Terminator Technology will not necessarily be infringing upon the rights of resource-poor farmers, nor will they

² A transgene is a gene taken from one organism and spliced into the genome of another through artificial means.

³ I understand that almost every objective take on a particular issue has at its foundation some bias that negates a truly objective view. My modest attempt at taking an objective look at the Terminator Technology debate will involve searching for a rational ground on which a particular objective view can be situated.

necessarily be wrongfully exploiting resource-poor farmers by expecting a return on their investments.

Aside from the limited range of concerns that I will address in this thesis, there are other serious concerns related to the potential implementation of Terminator Technology such as the broader social justice issues which include (but not limited to): the further oppression of resource-poor farmers through the imposition of barriers in the agricultural markets that effectively restrict their ability to direct their own lives; and greater economic inequalities arising from advances in agrotechnology that have the potential to become so great that poor farmers are left to fight an uphill battle for survival. Such dismal consequences may even help increase the existing gap between first-world and third-world countries. I raise these other concerns here to call attention to the broad scope of the issue of implementing Terminator Technology in commercial agricultural markets. Furthermore, there may be a variety of other ways that resource-poor farmers may be harmed by the implementation of this and other novel agrotechnologies. Even though these are all very important concerns, I will limit my discussion to the seemingly explicit objections made by NGOs and activist groups against the potential implementation of Terminator Technology.

It is not my aim to suggest that the limited scope of this thesis adequately addresses all of the issues concerning the possible implementation of Terminator Technology. To be explicit, I do not contend that there are no grounds upon which the commercial use of Terminator Technology can be morally condemned; all I intend to argue is that the implementation of Terminator Technology will not necessarily infringe upon the rights of resource-poor farmers nor will it necessarily wrongfully exploit them.

The remainder of this thesis is divided into four chapters: Chapter 2: The Case against Terminator Technology, Chapter 3: Human Rights, Chapter 4: Exploitation, and Chapter 5: Conclusion. In Chapter 2, I will recapitulate the main argument opposing Terminator Technology in an attempt to understand what, exactly, the opposition finds wrong with this technology. In Chapter 3: I will exposit Henry Shue's basic rights theory and explain how this theory can be used to understand the rights claims made by NGOs as a condemnation of Terminator Technology. I will argue that the implementation of Terminator Technology in commercial seed markets will not necessarily infringe upon the rights of resource-poor farmers. In Chapter 4, I will provide an exegesis of Judith Tormey's conception of exploitation, including critical revisions intended to fortify her view. After offering a coherent account of exploitation, I will analyze the Terminator Technology debate through the lens of my revised conception of exploitation. Here I argue that Terminator Technology will not necessarily present itself as a means for MACs to wrongfully exploit resource-poor farmers as long as these farmers are not duped into using terminator seeds through deceptive marketing schemes. In Chapter 5, I will argue that even though the potential implementation of Terminator Technology in the global agricultural market will neither inevitably infringe upon the rights of resource-poor farmers nor will it necessarily be used as a means to wrongfully exploiting resource-poor farmers, MACs still have a moral obligation to minimize the potential negative effects that implementing this technology may impose on resource-poor farmers and the global community; and with this in mind, MACs should proceed with caution.

Chapter 2: The Case against Terminator Technology

On March 3rd, 1998, the US patent entitled “Control of Plant Gene Expression” was jointly issued to Delta & Pine Land Company (D & PL) and the US Department of Agriculture (USDA).⁴ The actual technology protected by this patent is known within the scientific community as GURTs which is a term used refer to a complex of genes that are spliced into transgenic plants intended to control the full reproduction of certain varieties or the expression of particular phenotypes. There are two main categories of GURTs: T-GURTs, which restrict the expression of a certain trait (phenotype) by switching on or off a specific group of genes responsible for particular phenotypic expressions; and V-GURTs, which restrict the use of the entire plant variety by switching on a gene that terminates further reproduction of the plant.⁵ The expression of terminator genes is controlled by an external stimulus involving the application of a particular chemical (typically tetracycline) to the seeds containing these genes.⁶

The Action Group on Erosion, Technology and Concentration (ETC group), formerly RAFI (Rural Advancement Foundation International), has been leading the crusade against GURTs (specifically V-GURTs) since the late 1990's.⁷ When it began its campaign against GURTs, the ETC group (then RAFI) coined the term “Terminator Technology” referring to GURTs. The name “Terminator Technology” appears appropriate since this technology is used to alter the plant genome so as to produce sterile seeds. The ETC group is not the only activist group protesting the agricultural implementation of this technology, but they are the forerunners of the opposition.

⁴ P.K. Gupta, “The Terminator Technology for Seed Production and Protection: Why and How?” *Current Science* 75 (1998): 1319-1323; Bert Visser, et al., “The Impact of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 48 (2001): 9-12. There are actually three patents under the name “Control of Plan Gene Expression”: patent numbers 5,723,765 (March 3, 1998), 5,925,808 (July 20, 1999), 5,977,441 (November 2, 1999).

⁵ Bert Visser, et al., “The Impact of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 48 (2001): 9-12; Food and Agriculture Organization of the United Nations, “Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 2; Derek Eaton, et al., “Economic and Policy Aspects of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 49 (2002): 19-22.

⁶ United States Patent: 5,723,765, Oliver, et al. (March 3, 1998); P.K. Gupta, “The Terminator Technology for Seed Production and Protection: Why and How?” *Current Science* 75 (1998): 1319-1323; Bert Visser, et al., “The Impact of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 48 (2001): 9-12.

⁷ RAFI's work is widely cited by the several activist groups such as Food First (<http://www.foodfirst.org/progs/global/ge/sactoministerial/terminator/>), Primal Seeds (<http://www.primalseeds.org/terminator.htm>), Union of Concerned Scientists (http://www.ucsusa.org/publications/gene_exchange.cfm?publicationID=267), The Rockefeller Foundation (<http://www.rockfound.org/Documents/182/proprirights.pdf>), Greenpeace (http://archive.greenpeace.org/geneng/highlights/pat/98_09_20.htm), and Genetic Resource Action International (<http://www.grain.org/publications/rice-en.cfm>). RAFI has also been cited in several publications such as articles in Time Magazine (<http://www.organicconsumers.org/Monsanto/timeterm.cfm>) and The Ecologist (http://www.theecologist.org/archive_article.html?article=355); in Vandana Shiva's book, *Biopiracy*; and in Jack Wilson's article, “Intellectual Property Rights in Genetically Modified Agriculture,” which can be found in *Genetically Modified Foods*, eds. Michael Ruse and David Castle.

Because the ETC group is at the forefront of the crusade against Terminator Technology, I will first focus on explaining their reasons for opposing the use of GURTs in agricultural markets.

According to the ETC group, Terminator Technology is “an immoral technology that threatens global food security, especially for the 1.4 billion people who depend on farm-saved seed.”⁸ Terminator Technology is “immoral” because it infringes upon a farmer’s right to save the seed of her harvest for planting the next season’s crop.⁹ If terminator seeds are commercialized, farmers will be forced to “return to the seed corporations every year and will make extinct the 12,000-year tradition of farmers saving, adapting and exchanging seed in order to advance biodiversity and increase food security.”¹⁰ Also, these “suicide seeds” differ from hybrid seeds in that the latter do not produce sterile seeds, which allows the farmer to improve the agronomic performance of the hybrid seeds by cross-breeding them with indigenous varieties that are well adapted to specific bioregions. In order to put an end to farmers violating seed patents, MACs (such as Monsanto) have genetically altered some plant varieties so that the harvested seeds are sterile. The creation of Terminator Technology, according to the ETC group, is an attempt by MACs “to maximize seed industry profits by destroying the right of farmers to save their seeds and breed their own crops,” which not only infringes upon a farmer’s right to save seeds but also exploits farmers.¹¹

Also, implementing Terminator Technology will inevitably result in “biosefdom,” which will effectively hold farmers “hostage” to MACs by illegitimately capitalizing on the farmers’ vulnerabilities.¹² If resource-poor farmers lose control of their seeds, they will also lose control of their farming systems, rendering them dependent upon MACs for seeds and other agricultural inputs.¹³ According to the ETC group, “[Terminator Technology’s] sole purpose is to force farmers to return to the commercial seed market every year.”¹⁴ What’s more, if farmers become a sort of indentured servants to these MACs, national food security will be threatened, which may lead to poorer nations depending upon richer nations for food. So, the ETC group appears to believe that the commercial implementation of Terminator Technology does not bode well for farmers in poor nations, since such an “insidious technology” will possibly require the help of rich nations in the form of food aid that many times is not given without significant political strings attached.¹⁵

Siding with the ETC group, Dr. M.S. Swaminathan, “who was instrumental in making the Green Revolution a success in India describes the [terminator] technology as

⁸ ETC group (The Action Group on Erosion, Technology and Concentration), “Sterile Harvest: New Crop of Terminator Patents Threatens Food Sovereignty,” *News Release* 31 January 2002, <http://www.etcgroup.org> (05 February 2004).

⁹ *Ibid.*

¹⁰ ETC group, “Terminate Terminator in 2002: Defend Food Sovereignty,” 19 February 2002, <http://www.etcgroup.org/documents/terminatorbrochure02.pdf> (07 February 2004).

¹¹ *Ibid.*

¹² *Ibid.*

¹³ *Ibid.*

¹⁴ ETC group, “RAFI Annual Report: September 1997 – August 1998,” <http://www.etcgroup.org/documents/report98.PDF> (31 March 2004).

¹⁵ This paragraph is a paraphrasing of the ETC group’s position against Terminator Technology as it appears in the publication “Terminate Terminator.”

'unethical' and fears that it has the potential to 'endanger the country's food security.'"¹⁶ Dr. Swaminathan agrees that farmers need to be able to save the seeds of their harvest in order to ensure India's food security, and adds that this technology may imperil India's food security through unwitting farmers planting these "suicide seeds."¹⁷ If farmers unknowingly sow "suicide seeds," crops will not grow, and they will be left without both a product to sell and seeds to plant during the next season. If such a scenario obtains, agricultural production will fall precipitously in successive years resulting in both a more endangered food supply for India and farmers falling further in debt.¹⁸ In addition to the concerns over India's food security, Dr. Swaminathan fears that the chemicals used to render the seeds sterile (tetracycline or other chemicals) will make the seeds unsafe to consume, adding insult to injury.¹⁹

Furthermore, Dr. Swaminathan believes that

...there is a need for a universal declaration on Plant Genome and Farmers' Rights similar to the universal declaration on Human Genome and Human Rights adopted by the United Nations Educational, Scientific and Cultural Organization (UNESCO)...The UNESCO declaration stipulates in Article 10 that 'no research applications concerning the human genome, in particular in the fields of biology, genetics and medicine, should prevail over respect for the human rights, fundamental freedom and human dignity of individuals.'²⁰

It seems that the connection being drawn between the rights provided by the declaration on Human Genome and Human Rights and the need for a similar declaration on Plant Genome and Farmers' Rights is that both ensure (or would ensure) certain basic human rights. So, according to Dr. Swaminathan, farmers should have a right to the seeds of their harvest since such a right would further guarantee the basic right to food for people in poorer nations.²¹

Adding to this dismal outlook on GURTs, Christian Aid says in its report, "Selling Suicide," that "Even for better-off farmers in poor countries the terminator stands to raise costs and lock farmers into tightly controlled marketing and licensing agreements."²² This group concedes that farmers are not actually forced to begin using the seeds and other agricultural inputs sold by MACs. However, Christian Aid contends that the marketing techniques used by these companies are what get the farmers hooked.

¹⁶ Asha Krishnakumar, "Terminator of Food Security," *Frontline* 15, no. 21 (1998).

¹⁷ Ibid.

¹⁸ The alarming suicide rate among farmers in India is due to their inability to provide for their families. If the farmer kills himself, the government provides assistance to his remaining dependents. Christian Aid, "Selling Suicide: Farming, False Promises and Genetic Engineering in Developed Countries," May 1999, <http://www.christian-aid.org.uk/indepth/9905suic/suicide2.htm> (25 February 2004).

¹⁹ Asha Krishnakumar, "Terminator of Food Security," *Frontline* 15, no. 21 (1998).

²⁰ Ibid.

²¹ M.S. Swaminathan, "Farmers' Rights and Plant Genetic Resources," *Biotechnology and Development Monitor* 36 (1998): 6-9.

²² Christian Aid, "Selling Suicide: Farming, False Promises and Genetic Engineering in Developed Countries," May 1999, <http://www.christian-aid.org.uk/indepth/9905suic/suicide2.htm> (25 February 2004).

These aggressive marketing schemes are apparently an attempt to exploit uneducated farmers who are incapable of accurately discerning between unsubstantiated claims and scientific facts regarding the products being sold. Apparently, farmers also have to wade through enticement such as free seed trials, misleading promotions, and credits.²³ Moreover, if “suicide seeds” are aggressively marketed, “the worst scenario would be that within just a few years, poor farmers will no longer have their own, improved seeds to return to.”²⁴ Prohibited from saving their seeds by MACs’ implementation of GURTs, resource-poor farmers will be unable to breed new, stronger, more locally adapted varieties. This will give more control to the agrochemical companies while weakening the bargaining power of these farmers.

More importantly, some peasant farmers believe that patents on seeds will illegitimately infringe upon their basic rights by drastically limiting their freedom. According to Leopold Guilaran, a Visayas farmer, “...patents on seeds illustrate the extent to which transnationals want to establish monopolies on life, maximize profit, and dominate the world.”²⁵ Ka Memong Patayan, a Filipino peasant farmer who experienced colonial serfdom claims that “A patent on seeds is a patent on freedom...If you have to pay for patented seeds, it's like being forced to buy your own freedom.”²⁶

So, it seems the major moral objection to the potential implementation of Terminator Technology is that it will both infringe upon the basic rights of farmers and will allow MACs to use resource-poor farmers as a mere means to maximizing seed industry profits. If this is actually the case, corporations implementing Terminator Technology (such as Monsanto) will be wrongfully exploiting farmers, especially in poor nations. While wrongfully exploiting farmers through the use of Terminator Technology, MACs reap the benefits of resource-poor farmers becoming increasingly dependent upon their products, resulting in the farmers losing their ability to determine their own lives – essentially transforming these farmers into indentured servants by obligating them to meet the demands of their new masters (seed suppliers).²⁷ Also, if improperly controlled, “suicide seeds” will render the crops of unwitting farmers sterile, effectively reducing the agricultural products of those nations. If the food security of a developing nation is imperiled, it may lose its ability for self-determination making it more dependent upon wealthier nations for subsistence. As a result of all the alleged problems inextricably linked to the implementation of Terminator Technology, many activist groups consider its potential implementation to be immoral.

Generally speaking, the activist groups’ case against Terminator Technology seems to elicit an emotional response and may cause us to prejudicially condemn MACs for using this technology from a common sense moral position. In the wake of the recent attention to “corporate slavemasters” such as Nike, The Gap, Benneton, and Wal-Mart,

²³ Ibid.

²⁴ Ibid.

²⁵ GRAIN (Genetic Resource Action International), “Biopiracy, Trips and the Patenting Of Asia's Rice Bowl: A Collective NGO Situationer on IPRs on Rice,” May 1998, <http://www.grain.org/publications/rice-en.cfm#1> (16 February 2004).

²⁶ Katharine Ainger, “Is George Bush the new Bob Geldof?” *New Statesman* 16, no.763 (2003): 22.

²⁷ This term seems appropriate since many of the farmers who “choose” to abandon antiquated methods of agriculture for the sophisticated products provided by MACs become “hooked” by the morally questionable marketing techniques of these corporations.

which exploit workers in developing countries, we tend to think that this sort of corporate conduct is nothing new, albeit wrong.²⁸ Based on the claims made in this chapter, it seems that critics of this technology find it “immoral” because it will infringe upon the basic rights of resource-poor farmers and wrongfully exploit them in the name of economic gain. Before fully accepting the activists’ case against Terminator Technology, we need to examine the veracity of their arguments opposing this technology. As a result, I will demonstrate that even though the activists appear to be adamantly convinced that the potential implementation of Terminator Technology is morally reprehensible, they effectively fail to offer sufficient empirical proof to justify their claims.

²⁸ Rachael Naba, “The Gap, Nike, Benneton and Wal-Mart: Corporate Slavemasters,” <http://theearthcenter.com/ffarchivessweatshops1.html> (01 March 2004).

Chapter 3: Human Rights

In this Chapter, I will first discuss Henry Shue's conception of basic human rights, which seems appropriate for the current project, and then apply this conception to the potential implementation of Terminator Technology. As a prefatory note, I do not consider Henry Shue to be the authority on basic human rights. Shue's account of basic human rights appears to pose fewer problems than other rights theorists when applying these rights to the current project. Other human rights commentators such as Thomas Pogge and Jack Donnelly clearly have a political agenda to fulfill. Thomas Pogge develops an account of human rights that, as he claims, is "...a specific institutional understanding of what human rights are. It does not directly address the question of what human rights are."²⁹ Jack Donnelly understands human rights to be "a sort of self-fulfilling prophecy: 'Treat people like human beings...and you'll get truly human beings.' The forward-looking moral vision of human nature that is the source of human rights provides the basis for the social changes implicit in claims of human rights."³⁰ Both seem to understand human rights as a tool for making social changes. That is, human rights grant the right-holder the power to make legitimate demands on individuals and society that will result in improved social changes. Since I am not particularly interested advocating for any sort of social change in this project, I will avoid appealing to Pogge's and Donnelly's accounts of human rights. Instead, I will appeal to Henry Shue's account mainly because he attempts to discover which rights are essential to the enjoyment of any other rights. Such an account will be helpful in determining if the implementation of Terminator Technology is infringing upon farmers' most basic rights. Additionally, Shue's account is easily supported by a Kantian justification, which establishes a necessity for certain basic rights for humans to become and remain moral agents.

Some of the questions that will be addressed in this chapter are as follows. What basic rights do farmers legitimately have? Does the implementation of terminator technology in developing countries illegitimately infringe upon the basic rights of poor farmers? The main claim that I will defend in this chapter will be that Terminator Technology, if implemented in a legitimate manner, will not infringe upon a farmer's basic rights.

Section 3.1: Basic Human Rights

In our increasingly globalized world, it is often difficult to understand how we ought to treat other people in foreign nations. The difficulty here arises primarily from the fact that diverse cultures have different norms, which give rise to a wide variety of

²⁹ Thomas W. Pogge, *World Poverty and Human Rights: Cosmopolitan Responsibilities and Reforms* (Malden, MA: Blackwell Publishers Inc., 2002), 69.

³⁰ Jack Donnelly, *Universal Human Rights in Theory and Practice* (Ithaca, NY: Cornell University Press, 1989), 19.

acceptable treatments for human beings. In an attempt to establish a foundation for a set of universal human rights that transcend national and cultural boundaries, the United Nations developed The Universal Declaration of Human Rights (UDHR) after World War II. The rights detailed in the UDHR seem to be more than a set of basic rights that should apply to humans universally given that some of these rights go beyond a minimal standard for moral conduct.³¹ My intent here is not to develop a robust theory of human rights, but merely to determine a moral minimum below which no moral agent should be permitted to go. That is, I intend to establish a moral foundation for the basic rights of humans which will be useful in detecting situations where persons, throughout the world, illegitimately have their most basic rights infringed upon.

Many philosophers who develop conceptions of human rights tend to grant these rights to all humans merely on the grounds that they belong to the species *Homo sapiens*. Granting such rights to all humans simply because they are human is problematic since not all humans are capable of directly enjoying the objects of all “human rights.” Some humans, especially those who are mentally incapacitated, are not able to enjoy many of the rights detailed in the UDHR. However, defending a set of basic rights that would apply to both human beings and non-human beings is beyond the scope of this project.³² My focus here will be to identify the basic rights needed by those members of our species who are sufficiently functional to fully realize the capacities that are uniquely human. That is, I intend to offer a set of basic human rights required by humans to develop realize the capacity unique to humans – namely to develop into moral agents. In order to attain this goal, I will appeal to Henry Shue’s account of basic rights and a Kantian justification for such rights. Admittedly, Kantian theories are often criticized for narrowness of scope, resulting in either marginalizing or completely disregarding the interests of moral patients (both human and non-human). However, it is reasonably sufficient to deal only with moral agents in this project since the case against Terminator Technology deals with the basic rights of farmers who are moral agents.

In his book, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy*, Henry Shue claims that moral rights essentially provide a rational basis for a justified demand on others for certain things or treatments, and that the actual enjoyment of a particular moral right is socially guaranteed (or protected) against threats.³³ Furthermore, a right is a demand on others to either *avoid* interfering with the right-holder’s enjoyment of a particular right or a demand on others to *provide* something to the right-holder that is essential to the enjoyment of a particular right. In this latter case, Shue maintains that for a right to be fulfilled, arrangements (either legal or social) must be in place ensuring that particular rights are capable of being enjoyed.³⁴ Such arrangements offer a minimum guarantee against threats to particular rights.³⁵ Shue claims:

³¹ Article 24 of the UDHR states: “Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.” Having a right to “periodic holidays with pay” seems to go beyond a minimal standard of how people ought to be treated.

³² Severely mentally incapacitated humans and some higher non-human animals may deserve some rights even if they are not found to be deserving of “human rights.”

³³ Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 13.

³⁴ *Ibid.*, 16.

³⁵ *Ibid.*

...one of the chief purposes of morality in general, and certainly of conceptions of rights, and of basic rights above all, is indeed to provide some minimal protection against utter helplessness to those too weak to protect themselves. Basic rights are a shield for the defenseless against at least threats, which include...loss of security and loss of subsistence. Basic rights are a restraint upon economic and political forces that would otherwise be too strong to be resisted. They are social guarantees against actual and threatened deprivations of at least some basic needs. Basic rights are an attempt to give to the powerless a veto over some of the forces that would otherwise harm them the most.³⁶

So, according to Shue, basic rights serve as a moral minimum for what we owe to others and for what we can reasonably expect from others.³⁷

Basic rights are considered basic since the enjoyment of all other rights depends on the enjoyment of basic rights.³⁸ This is why basic rights are inalienable or nontransferable: to sacrifice basic rights for a non-basic right (such as sacrificing the right to security for a right to leisure) is self-defeating since the enjoyment of the basic right is necessary for the enjoyment of non-basic rights.³⁹ This point is more than a mere practical assertion or an empirical fact, it is also logically necessary. First, persons are purposeful beings that, by their very nature, set goals and go about fulfilling them on a regular basis. Further, it is empirically true that persons require the basic rights of freedom and well-being in order to pursue their individual aims. Yet it does not follow that one has a *right* to anything and everything that one requires to fulfill one's individual aims. That is, just because A requires X to fulfill goal Y does not necessarily mean that A has a *right* to X. Consequently, we must appeal to something more fundamental than mere individual aims to set a firm foundation for the basic moral rights of persons. One such justification is Kant's metaphysical moral criterion of universalizability, which requires that a proposition be logically consistent for it to be universalizable. In the case of making false promises, Kant claims that it is logically inconsistent to hold that it should become a universal law that everyone ought to make a false promise when it suits them since doing so would negate the proposition that it is possible to make a false promise. Put differently, making a false promise requires that others typically make honest promises in order for a false promise to masquerade as an honest promise. If it were a universal law that everyone should make a false promise when it suits them, then false promises would be the norm and to make a false promise would cease to be fruitful since no one would trust promises. As a result, making a false promise cannot be universalized, since doing so is logically inconsistent (or self-defeating). Similarly, Kantians assume that it is logically inconsistent to claim that one is an autonomous being who requires security and subsistence to realize (or enact) one's autonomous nature,

³⁶ Ibid., 18.

³⁷ Ibid., 18-19.

³⁸ Ibid., 19.

³⁹ Ibid.

while holding that autonomous beings do not have a legitimate right to freedom and well-being.⁴⁰

Shue believes the right to security and the right to subsistence to be the two most basic moral rights one can have.⁴¹ He understands the right to security as being a guarantee that one will not be threatened with murder, rape, beating, or any other physical harm when attempting to enjoy a particular right.⁴² Shue suggests that “such threats to physical security are among the most serious and – in much of the world – the most widespread hindrances to the enjoyment of any right.”⁴³ If people are not granted a basic moral right to physical security, then they cannot make legitimate demands on others to allow them to enjoy a particular right, without fear of physical harm, which may tend to diminish their ability to enjoy the right.⁴⁴

By a “right to subsistence,” Shue means that people have a right to at least subsistence and possibly nothing more extending beyond mere subsistence.⁴⁵ The right to subsistence establishes a moral minimum to allow those who can to provide for themselves (or to provide to those who cannot), and because of this right, people can reasonably expect “some level of social organization to protect the minimal cleanliness of air and water and to oversee the adequate production, or import, and the proper distribution of minimal food, clothing, shelter, and elementary health care.”⁴⁶ Accordingly, it is the responsibility of society to fulfill and secure subsistence rights since the problems that stem from a deficiency in subsistence are “serious and general” in that failure to correct such a deficiency “would hinder the enjoyment of all other rights.”⁴⁷ Furthermore, guaranteeing subsistence is an “inherent necessity” since having unimpeded access to the basic necessities of life (such as those detailed in the right to subsistence) is not separate from the enjoyment of any other rights. Instead, having adequate food, water, shelter, etc. are essential to the enjoyment of all other rights.⁴⁸ So to have a right to subsistence means that one has a right to “unpolluted air, unpolluted water, adequate food, adequate clothing, adequate shelter, and minimal preventative public healthcare.”⁴⁹

Shue also draws a distinction between “having” a right and “enjoying” a right. It does not make much practical sense for one merely to have a right when the enjoyment of

⁴⁰ The above argument is a variation of Arnold’s appeal to Alan Gewirth’s justification for granting persons the rights to freedom and well-being. Denis G. Arnold, “Moral Reasoning, Human Rights, and Global Labor Practices,” in *Rising Above Sweatshops: Innovative Management Approaches to Global Labor Challenges*, eds. Laura P. Hartman , Denis G. Arnold , Richard E. Wokutch (Westport, CT. : Praeger, 2003).

⁴¹ In *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy*, Shue actually claims that there are three basic rights: a right to security, a right to subsistence, and a right to liberty.

⁴² Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 21.

⁴³ *Ibid.*, 19.

⁴⁴ Benefiting from infringing on a persons right to security would be considered a case of wrongful exploitation since the right-holder is physically harmed as a result of being used as a means to the exploiter’s end. Such a situation is typically defined as coercive.

⁴⁵ Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 23-24.

⁴⁶ *Ibid.*, 25.

⁴⁷ *Ibid.*, 25-26.

⁴⁸ *Ibid.*, 26.

⁴⁹ *Ibid.*, 23.

the right is not guaranteed. In such a case, there would be no practical difference between having a right and not having a right since the right-holder would not have an enforceable claim on others to allow her to actually enjoy the right. Shue maintains that humans deserve basic moral rights to security and subsistence because these two rights grant humans the power to morally demand that others either allow access to or provide the basic necessities required for human flourishing, regardless of how we define "human flourishing." Likewise, for someone or something to be an appropriate recipient of a right, that person or thing must be capable of enjoying the object of a particular right.⁵⁰ It seems reasonable to maintain that one must first have the capacity to *directly* enjoy the object of a particular right (of any kind) before we can say that one should have such a right. For example, it makes little sense (if any) to claim that a man should have a right to an abortion for he is unable to *directly* enjoy the object of this right. Granted, a man can enjoy the effects of a woman having an abortion to a certain extent since, through an abortion, he can relieve himself of any and all parental duties. However, he is not directly affected by the pregnancy as is the mother. Since the mother is directly affected by the pregnancy, insofar as the pregnancy involves her own body, it makes sense to grant her the right to an abortion.⁵¹ So, we can make two distinctions here: 1) one must be capable of enjoying the object of a particular right for one to actually have the right, and 2) if one is said to have a particular right one should at least be allowed to enjoy the object of the right.

The need for appealing to a conception of basic rights is to establish a moral minimum that may help to reduce the vulnerability people have to being deprived of the basic things that they need to develop into autonomous moral agents and to maintain such a status. Both positive and negative rights require different sorts of obligation owed, by the duty-holder, to the rights-holder. Expressly, the conception of rights that I am espousing here will necessarily correspond with duties. The specific duties that correlate with certain rights will depend upon both the sort of right in question and the relation between the right-holder and the duty-bearer. That is, a right-holder can legitimately expect a certain response from the duty-bearer based on the relationship that exists between them.

As for the specific duties owed to a rights-holder, Shue claims that there are three general duties that correlate with each basic right: 1) A duty to avoid depriving a person of the object of a right; 2) A duty to protect from depriving a person of the object of a right; and 3) A duty to aid a person that is deprived of the object of a basic right.⁵² Regarding the right to subsistence, which is most applicable to this project, others have the following correlative duties:

⁵⁰ An object of a right is merely the thing that the right guarantees the enjoyment of. That is, the object of a right to freedom is the actual enjoyment of freedom. One can be said to have a right to freedom without being granted the enjoyment of freedom. In such a situation, we would normally say that this person's right to freedom is being infringed upon since the person is denied the object of the right to freedom.

⁵¹ I am not defending or categorizing the right to an abortion here. My only intent is to demonstrate that such a right (if granted) can only be directly enjoyed by a woman, and that being able to directly enjoy the object of the right is a necessary (but not a sufficient) reason for granting persons a right of any kind.

⁵² Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 52.

- I. To avoid eliminating a person's only available means of subsistence.
- II. To protect persons against deprivation of the only available means of subsistence by other persons
 1. By enforcing duty (I) and
 2. By designing institutions that avoid the creation of strong incentives to violate duty (I).
- III. To aid the deprived
 1. Who are one's special responsibility,
 2. Who are victims of social failures in the performance of duties (I), (II-1), (II-2) and
 3. Who are victims of natural disasters.⁵³

The duty to avoid eliminating a person's only available means of subsistence applies to everyone in society and merely requires that one "refrain from making an unnecessary gain for oneself by a means that is destructive to others."⁵⁴ According to Shue, duties to protect or to aid are "attached to certain roles or relationships and rest therefore upon only those who are in a particular role or relationship and are borne toward only those other persons directly involved."⁵⁵ Thus, these two duties – to protect and to aid – do not necessarily fall upon all individual members of a society, but, more specifically, these duties fall upon the governing body of the particular society in question.

Shue suggests that the government should be expected to enforce the primary duties that correlate with basic rights since the government legitimizes itself (at least in some respect) by acting on the behalf of the members of society.⁵⁶ Certain individuals or groups of individuals within a society may be charged with a duty to protect others against deprivation or to aid the deprived, but such duties arise out of particular relationships in which the duty-bearer is the guardian of the right-holder.⁵⁷ For instance, a parent is charged with all three duties to her children in virtue of her guardian role.

So, individuals have basic rights to security and subsistence, which are necessary both for their autonomous moral development and for the enjoyment of all other rights. All individuals within society (both global and local) have a moral duty to avoid unnecessarily depriving persons of their basic rights. If persons are deprived of the objects of their basic rights, the individuals' home government is obliged to both protect against further deprivation and provide aid for the deprived. Moreover, the home government is not the only entity (or individual) responsible for protecting and aiding the

⁵³ Ibid., 53 & 60.

⁵⁴ Ibid., 55. Shue does not make the following claim, but some might argue that it may be necessary in times of extreme resource scarcity that one deprive others of adequate food, shelter, or clothing in order for one to provide for oneself or for one's dependents. In such a situation, one is choosing one's own survival or the survival of one's dependents over others, which seems (at most) morally permissible under circumstances involving extreme resource scarcity.

⁵⁵ Ibid., 56.

⁵⁶ Ibid.

⁵⁷ In the case of a multinational corporation, Shue claims that such duties should be fulfilled by the home government or even by multilateral government action. Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 56.

deprived: certain relationships formed between individuals (or groups of individuals) may grant the right-holder a legitimate moral claim on the other individual (or group) involved in the relationship.

Section 3.2: Terminator Technology and Basic Rights

At this point, I would like to address some of the claims made against Terminator Technology in Chapter 2. The activists' major objection to the potential implementation of Terminator Technology is that it is "immoral" because it infringes upon a farmer's right to save the seed of her harvest for planting the next season's crop. In Chapter 2, I interpreted this claim to mean that implementing Terminator Technology will necessarily infringe upon a farmer's right to subsistence, namely adequate food. This may not only mean that resource-poor farmers are denied adequate food but also that they may be denied the means of economic viability required to purchase adequate food, water, shelter, etc. To adequately evaluate the critics' claims opposing Terminator Technology, we must first understand why this technology was developed and the context in which it will be implemented, which will include searching for a justification for a "right to save seeds."

Terminator Technology was not developed without necessity. Apparently the impetus for the creation and development of this novel technology was to ensure that plant breeders' intellectual property rights would *actually* be protected. The practice of putting patents on agricultural plants is nothing new and has been available since 1930.⁵⁸ Although patenting has been available for the past 74 years, it has lacked the power to completely protect the intellectual property of persons or corporations. Prior to the recent techno-era, intellectual property protection required extensive policing to catch patent violators. Even after a culprit was caught using a corporation's intellectual property without authorization (usage is typically authorized in the form of a payment made to the corporation), the corporation would have to take litigious action against the culprit. Both policing and convicting unauthorized use of a corporation's intellectual property is expensive for the corporation, which may diminish the amount of capital a firm can invest in research and development.⁵⁹ It is very difficult (and perhaps impossible) to completely guard against the unauthorized use of agricultural products due two factors: 1) the impossibility of testing each and every organism for genetic fingerprinting, and 2) remotely controlling an organism that is free to replicate itself. So, how better to efficiently and effectively prohibit the unauthorized usage of a corporation's intellectual

⁵⁸ Jack Wilson, "Intellectual Property Rights in Genetically Modified Agriculture: The Shock of the Not-So-New," in *Genetically Modified Foods: Debating Biotechnology*, eds. Michael Ruse and David Castle (New York, Amherst: Prometheus Books, 2002), 151.

⁵⁹ Food and Agriculture Organization (FAO) of The United Nations, "Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems," 2-4 July 2001, <http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPS/PGR/ITWG/pdf/P1W7E.pdf> (27 April 2004).

property than to empower the property with a self-regulating capability? Hence: the dawn of GURTs.⁶⁰

For commercial plant breeders, intellectual property protection involves either manipulating the seed itself or the farmers who purchases the seeds, and the more that one is manipulated the freer the other becomes.⁶¹ Consequently, if the plants cannot be manipulated to ensure the protection of a firm's intellectual property, then the firm must attempt to manipulate the farmer in order to gain a return on their investment.⁶² At least from the commercial breeders' perspective, manipulating their seeds through the use of GURTs is a much more efficient and effective way of protecting their intellectual property. Also, as pointed out above, Terminator Technology will (once widely implemented in the commercial seed industry) prohibit farmers from sowing the seeds from their harvest, which is the intended purpose of this technology.

The question that needs to be addressed at this point is: Does Terminator Technology *wrongfully* prohibit farmers from saving their seeds? If prohibiting farmers from saving their seeds is wrong, the activists opposing Terminator Technology fail to demonstrate *why* this is wrong. Attempting to take an objective view, we can see that both commercial plant breeders and resource-poor farmers have rights at stake here – each have a right to reap the returns of their investments. Such a right stems from the right to own property as detailed in the UDHR.⁶³ On the one side we can see that commercial plant breeders have a right to seek (or expect) a return on their investment of capital in the research and development of certain modified crops such as *Bt* cotton and Roundup soybeans. For example, to have a right to own property but not a right to reap the benefits of the property would imply that one has a right but does not deserve to enjoy the object of the right. Owning property is not necessarily intrinsically valuable, one enjoys such a right insofar as one is capable of (or allowed to) reaping the benefits of the property. On the other side, resource-poor farmers have the right to command the fruits of their labor such as saving or sharing the seeds of their harvests.

However, neither the plant breeder nor the farmer has a *right* to profit (or benefit in some respect) from property that is not theirs. Even though breeders currently have a legal right to expect remuneration for the subsequent use of their patented seeds (since they legally own such seeds), it is still morally disputed that the fruits of patented plants belong to those breeders. If it can be demonstrated that breeders have a moral right to patent organisms that they significantly alter, then it would be morally unjustifiable to claim that farmers have a right to save patented GM seeds. But that claim is beyond the

⁶⁰ Use restriction technology of particular plant varieties has been in place for several years now, but this technology has been predominantly used in hybrid varieties (such as maize and sunflowers). The use of hybrid varieties are controlled by a decreasing crop yield in F₂ and subsequent generations, forcing farmers to purchase seed each year to maintain a maximum crop yield. GURTs are primarily used in self-pollinated crops such as wheat, corn, and soybeans, which cannot be engineered to produce decreasing yields in subsequent generations. P.K. Gupta, "The Terminator Technology for Seed Production and Protection: Why and How?" *Current Science* 75 (1998): 1319-1323.

⁶¹ Jack Wilson, "Intellectual Property Rights in Genetically Modified Agriculture: The Shock of the Not-So-New," in *Genetically Modified Foods: Debating Biotechnology*, eds. Michael Ruse and David Castle (New York, Amherst: Prometheus Books, 2002), 157.

⁶² *Ibid.*

⁶³ Article 17 of the Universal Declaration of Human Rights states, "Every one has the right to own property alone as well as in association with others."

scope of this thesis. Nevertheless, from a legal perspective, commercial plant breeders do not have a right to patent organisms that they did not significantly alter, nor do farmers have a right to share or save patented seeds. To affirm such rights would be, in effect, to affirm a right to what is from a legal standpoint thievery.

In order to get at the exact reason (or set of reasons) that makes prohibiting farmers from saving their seeds “immoral,” we must first examine what the opposition might mean when they say that farmers have a “right” to save their seeds. When people use the term “rights” to refer to some inalienable access to something (such as food, healthcare, freedom, etc.), they are sometimes confused as to what legitimate claims they can make on others in the name of rights. As I argued above, individuals have a basic right to security and subsistence. A right to save seeds appears to be derived from a basic right to subsistence even though no specific “right to save seeds” is actually acknowledged by the Food and Agriculture Organization of the United Nations or any other “neutral” organization. Apparently, the ETC group merely assumes that such a right should exist. According to the ETC group, “...the FAO Commission on Genetic Resources for Food and Agriculture has been negotiating revisions to the Undertaking. RAFI has followed these negotiations closely, and has worked to influence their outcome. We have pressed for a broad interpretation of ‘Farmer’s Rights’ – including the right to save seeds....”⁶⁴ Consequently, the ETC group (then RAFI) was unsuccessful in establishing a “right” to save seeds and seems to merely assume that such a right should exist.

The ETC group may appeal to Shue’s argument above as supporting their claim that implementing Terminator Technology is “immoral” since it necessarily infringes upon farmers’ right to subsistence. In an attempt to evaluate the ETC group’s potential claim, we need to answer the following two questions. Is a right to saving seeds inherently necessary to the enjoyment of a right to subsistence? If so, are MACs infringing upon the farmers’ right to subsistence by disallowing them to save the seeds of their harvest? To answer the first question: Saving seeds *is not* an essential part of the enjoyment of a right to subsistence since one is still free to enjoy the right to subsistence even if one is unable to save seeds. Admittedly, farmers in poor nations do not have many viable alternatives to eke a meager living for themselves and their dependants, but being allowed to save GM seeds is not inherently necessary to obtaining adequate food, clothing, shelter, etc. To be very clear: MACs are not actually preventing farmers from saving all seeds.

According to Shue, basic rights are to be guaranteed by the home government or a multilateral government action.⁶⁵ MACs may have a moral obligation to avoid

⁶⁴ The ETC group, “RAFI Annual Report: September 1997 – August 1998,” <http://www.etcgroup.org/documents/report98.PDF> (27 March 2004). The FAO explicitly states that it adheres to the United Nations UDHR and more specific to agricultural practices, that all people have a right to food. Food and Agriculture Organization of the United Nations, “Report on the Panel of Eminent Experts on Ethics in Food and Agriculture,” (Rome 2003) <http://www.fao.org/DOCREP/005/Y8265E/Y8265E00.HTM> (03 August 2004). Apparently the ETC group and others believe that in order to ensure a person’s right to food farmers must be granted the right to save the seeds of their harvest.

⁶⁵ Henry Shue, *Basic Rights: Subsistence, Affluence, and U.S. Foreign Policy* (Princeton, NJ: Princeton University Press, 1980), 56.

eliminating the farmers' only available means of subsistence and to refrain from making an unnecessary gain by means that are illegitimately destructive to the farmers.⁶⁶ First of all, there is no clear case of tangible harms resulting from the implementation of Terminator Technology, since this technology has yet to be released from the laboratory into the global agricultural market.⁶⁷ Some opponents of Terminator Technology, such as Dr. Swaninathan, are concerned that the chemicals used to switch on the terminator gene may make the seeds unsafe to consume, which could be construed as a sort of direct harm resulting from Terminator Technology. Tetracycline (an antibiotic) is typically applied to the F₁ generation of seeds, which triggers a gene to produce RIP (ribosome inhibitor protein), which inhibits embryo development in the F₂ generation, thereby rendering the F₂ seeds sterile. It has not been proven that tetracycline will actually affect the safe consumption of F₂ seeds. Moreover, the tetracycline may be washed off or biodegraded during the growing season leaving the crops tetracycline free. The main concern here is that people or animals may be harmed if the F₁ seed is directly consumed instead of planted. However, it is implausible to think that people will knowingly purchase genetically modified F₁ seeds from breeders for direct consumption since these seeds will probably be more expensive than seeds intended to be eaten. Moreover, the application of chemicals such as tetracycline is not the only or preferred method for inducing the terminator gene. The induction may be either chemical or physical (e.g. osmotic shock or temperature shock).⁶⁸ So, in the event that certain chemical inducers are proven to cause health problems when treated seeds are directly consumed, commercial seed breeders should be required to adopt a physical method of induction to avoid causing direct physical harm to animals or humans.⁶⁹

Moreover, some critics claim that the pollen of genetically modified crops containing the terminator gene may drift to neighboring stands, potentially fertilizing the non-GM plants, and possibly rendering the harvested seeds sterile.⁷⁰ In addition to the potential negative socioeconomic consequences of implementing terminator technology,

⁶⁶ Ibid., 55.

⁶⁷ Food and Agriculture Organization of the United Nations, "Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 4; Henry Daniell, "Molecular Strategies for Gene Containment in Transgenic Crops," *Nature Biotechnology* 20, (June 2002): 586; National Research Council of the National Academies, *Biological Confinement of Genetically Engineered Organisms* (Washington, DC: The National Academies Press, 2004), 72.

⁶⁸ Henry Daniell, "Molecular Strategies for Gene Containment in Transgenic Crops," *Nature Biotechnology* 20, (June 2002): 583.

⁶⁹ One other possibility would be to engineer the seeds in such a way as to require the application of tetracycline to switch off the terminator construct. Consequently, during the breeding process before sale, seeds would be treated with tetracycline in order to turn the terminator construct off, allowing breeders to continue producing more seeds. The application of such a method would mean that the terminator seed sold would never have been treated with tetracycline and would not be responsible for any adverse health effects that this antibiotic might cause. Cullen N. Pendleton, "The Peculiar Case of 'Terminator' Technology: Agricultural Biotechnology and Intellectual Property Protection at the Crossroads of the Third Green Revolution," *Biotechnology Law Report* 23, no. 1 (2004): 7; Niels P. Louwaars et al., "Policy Response to Technological Developments: The Case of GURTs," *Journal of New Seeds* 4, no. 1-2 (2002): 91; Stuart Smyth, George G. Khachatourians, and Peter W.B. Phillips, "Liabilities and Economics of Transgenic Crops," *Nature Biotechnology* 20 (June 2002): 541.

⁷⁰ Charles Choi, "The Terminator's Back," *Scientific American* 287 (Sep 2002):30.

there is concern that the introgression of unique phenotypes (such as herbicide tolerance or drought resistance) may give wild relatives a fitness edge. Although gene flow between crops and wild relatives has occurred for centuries, the potential introgression of novel genes (such as those that produce herbicide tolerance or drought resistance) into wild populations poses some serious problems. If the outcrossing of certain genes gives a wild relative a fitness advantage, the particular species has the potential to become invasive.⁷¹ If this potentiality becomes a reality, critics claim that this would imperil poor nations' food security and destroy resource-poor farmers' only means of subsistence. Before directly dealing with this criticism, a brief description of the science behind gene flow may be helpful.

First of all, the science behind genetic drift is far from developed. There currently exists a paucity of interdisciplinary research on the actual ecological and agronomic impacts of transgene flow.⁷² One important thing to keep in mind is that, according to Henry Daniell,

...gene flow depends on several variables: the specific crop, its location, the presence of outcrossing wild relatives/sexually compatible crops, the competitive nature (advantages and disadvantages) of the introduced trait, and the environmental consequences of traits. Two mechanisms are responsible for the movement of genes among crops and their wild relatives/related crops: dispersal in viable pollen or dissemination in seed (the latter germinates and produces viable pollen).

The potential for gene flow through pollen depends on such variables as the amount of pollen produced, longevity of pollen, dispersal of pollen (as by wind or animals), plant/weed density, dormancy/rehydration of pollen, survival of pollen from toxic substances secreted by pollinators, the distance between crops and weeds, and whether these plants are sexually receptive to the crop.⁷³

Consequently, it is not yet possible to accurately predict the exact outcrossing rates for every crop variety due to the multiple variables that must be taken into consideration when attempting to discern the probability of transgene flow actually occurring.

Current scientific evidence proves that transgenes are essentially no different from other genes in that both disperse and become incorporated into the genomes of other,

⁷¹ N.C. Ellstrand, "Gene Flow from Transgenic Crops to Wild Relatives: What Have Learned, What Do We Know, What Do We Need to Know?" in *Scientific Methods Workshop: Ecological and Agronomic Consequences of Gene Flow from Transgenic Crops to Wild Relatives* (Columbus, OH: 2002): 41. Available at <http://www.biosci.ohio-state.edu/~asnowlab/Proceedings.pdf> ; Allison A. Snow, "Transgenic Crops – why gene flow matters," *Nature Biotechnology* 20 (June 2002): 542.

⁷² Allison A. Snow, "Transgenic Crops – why gene flow matters," *Nature Biotechnology* 20 (June 2002): 542.

⁷³ Henry Daniell, "Molecular Strategies for Gene Containment in Transgenic Crops," *Nature Biotechnology* 20, (June 2002): 581.

related plants.⁷⁴ However, outcrossing theories based on conventional agricultural models cannot adequately predict the unintended consequences of transgene introgression.⁷⁵ Merely acknowledging that the mode of transgene introgression is the same as conventional gene introgression does not reveal much about how transgenes behave once incorporated into other genomes. Unfortunately, the current framework for understanding how transgenes behave is based on conventional agriculture models, and due to the novelty of transgenes, the techniques used in current agricultural models are not able to adequately predict the transfer of traits at the molecular level.⁷⁶ Despite the increased research aimed at understanding the ecological and agronomic impacts of transgene flow, there remains an inability to effectively predict the real-world consequences of commercializing transgenes.⁷⁷ It is currently impossible to completely prevent gene flow between sexually compatible species growing in the same area since pollen and seeds disperse too widely and too easily.⁷⁸ There is little information available concerning the actual dispersion of pollen for different crops in the field,⁷⁹ but one study found that canola pollen can drift anywhere from 2.5 to 25,000 meters, wheat pollen can drift between 48 and 400 meters, and corn pollen can drift as far as 50 meters.⁸⁰

One shortcoming of the current outcrossing studies is that these experiments only take into consideration the unimpeded rate of outcrossing. This means that if wheat (for example) is demonstrated to have a maximum outcrossing rate of 6.1%, this rate does not include the presence of a physical barrier. The main problem is that there are no standard outcrossing rates for particular crop varieties. The reported outcrossing rate for 10

⁷⁴ Allison A. Snow, "Transgenic Crops – why gene flow matters," *Nature Biotechnology* 20 (June 2002): 542; N.C. Ellstrand, "Gene Flow from Transgenic Crops to Wild Relatives: What Have Learned, What Do We Know, What Do We Need to Know?" in *Scientific Methods Workshop: Ecological and Agronomic Consequences of Gene Flow from Transgenic Crops to Wild Relatives* (Columbus, OH: 2002): 41; James Hancock, "A Framework for Assessing the Risk of Transgenic Crops," *BioScience* 53, no. 5 (May 2003): 512-513.

⁷⁵ N.C. Ellstrand, "Gene Flow from Transgenic Crops to Wild Relatives: What Have Learned, What Do We Know, What Do We Need to Know?" in *Scientific Methods Workshop: Ecological and Agronomic Consequences of Gene Flow from Transgenic Crops to Wild Relatives* (Columbus, OH: 2002): 41- 42. Available at <http://www.biosci.ohio-state.edu/~asnowlab/Proceedings.pdf>.

⁷⁶ James M. Tiedje et al., "The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations," *Ecology* 70, no. 2 (April 1989): 306.

⁷⁷ Allison A. Snow, "Transgenic Crops – why gene flow matters," *Nature Biotechnology* 20 (June 2002): 542.

⁷⁸ Allison A. Snow, "Transgenic Crops – why gene flow matters," *Nature Biotechnology* 20 (June 2002): 542. Snow is correct, it is currently impossible to completely prevent gene flow mostly due to the fact that no tried and true bioconfinement methods are available at this time. James Hancock, "A Framework for Assessing the Risk of Transgenic Crops," *BioScience* 53, no. 5 (May 2003): 512-513. The only reliable means of completely avoiding gene flow is to breed crops in isolation from other, reproductively compatible plants. Such a level of isolation is very difficult and may be impossible especially for commercial applications. Peter N. Mascia and Richard B. Flavell, "Safe and Acceptable Strategies for Producing Foreign Molecules in Plants," *Current Opinion in Plant Biology* 7 (2004): 189-195.

⁷⁹ N.C. Ellstrand, "Gene Flow from Transgenic Crops to Wild Relatives: What Have Learned, What Do We Know, What Do We Need to Know?" in *Scientific Methods Workshop: Ecological and Agronomic Consequences of Gene Flow from Transgenic Crops to Wild Relatives* (Columbus, OH: 2002): 41.

⁸⁰ Stuart Smyth, George G. Khachatourians, and Peter W.B. Phillips, "Liabilities and Economics of Transgenic Crops," *Nature Biotechnology* 20 (June 2002): 540.

Canadian spring wheat cultivars, for example, is between 0.3% and 6.1% without the imposition of a physical barrier.⁸¹ Without a standard outcrossing rate, we could not adequately determine the effectiveness of the barrier. The main point here is that there are a variety of variables contributing to the different outcrossing rates that a particular species will have, and without a standardized outcrossing rate for each crop, physical barriers cannot be effectively evaluated.

Nevertheless, factors such as various flowering times, isolation zones, and barrier crops can only reduce the rate of outcrossing – if sexually compatible plant varieties exist within dispersal zones, transgenes will escape.⁸² Since physical means of containing transgenes may prove to offer an unacceptably high level of outcrossing, biological confinement methods might offer an adequate level of transgene confinement.⁸³ Currently there are approximately eight bioconfinement methods being developed for agricultural and horticultural uses (Table 1). Apparently, bioconfinement research is an attempt to create a responsible method for containing transgenes so as to inhibit their escape into the natural environment, limiting the potential negative consequence that transgenic organisms may cause in natural ecosystems.

One such bioconfinement method is seed sterility (Terminator Technology), which is Monsanto's chosen method for prohibiting the unauthorized perpetual use of certain plant varieties. None of the other bioconfinement methods have received as much (if any) criticism for their potential implementation in commercial markets. Granted, a few of the methods do not prohibit the continued use of the entire plant, but all are intended to control certain genetically modified characteristics of particular plant varieties.

⁸¹ P. Hucl and M. Matus-Cadiz, "Isolation Distances for Minimizing Out-Crossing in Spring Wheat," *Crop Science* 41 (2001): 1348.

⁸² James Hancock, "A Framework for Assessing the Risk of Transgenic Crops," *BioScience* 53, no. 5 (May 2003): 513. The effectiveness of isolation zones depends on the how a crops pollen or seed is dispersed. The impact of isolation zones on the outcrossing of insect-pollinated crops is dependent upon insect behavior. That is, experiments must demonstrate various isolation zone widths ability to deter insects from moving from one crop to another. Barrier crops may reduce the amount of pollen dispersed to other fields by absorbing some of the wind-blown GM pollen. Also these crops would consist of flowering varieties that distribute their own pollen (these crops should not be sexually compatible with neighboring crops) in order to dilute pollen drifting between crops and entice vector insects to visit their flowers before visiting the next crop (the latter are called trap crops). Katie Eastham and Jeremy Sweet, *Genetically Modified Organisms (GMOs): The Significance of Gene Flow through Pollen Transfer* (Copenhagen, Germany: European Environmental Agency, 2002): 59. Available at http://reports.eea.eu.int/environmental_issue_report_2002_28/en/GMOs%20for%20www.pdf.

Morris et al found that barrier crops significantly reduced gene escape, but even with the lowest outcrossing rate of 0.94%, genes managed to escape into neighboring fields. William F. Morris, Peter M. Kareiva, Paul L. Raymer, "Do Barren Zones and Pollen Traps Reduce Gene Escape from Transgenic Crops?" *Ecological Applications* 4, no. 1 (1994): 157–165.

⁸³ Gene flow is a real concern and horticultural experiments have demonstrated that outcrossing can occur between crops and wild relatives. Norman Ellstrand, "When Transgenes Wonder, Should We Worry?" *Plant Physiology* 125 (April 2001):1543–1545; James F. Hancock, "A Framework for Assessing the Risk of Transgenic Crops," *BioScience* 53, no. 5 (May 2003): 512-519; Anne-Marie Chevre et al., "Gene Flow from Transgenic Crops," *Nature* 389 (30 October 1997): 924; Joy Bergelson, Colin B. Purrington, and Gale Wichmann, "Promiscuity in Transgenic Plants," *Nature* 395 (September 1998): 25.

Table 1: Current and Future Technologies for Transgene Containment⁸⁴

Technique ⁸⁵	Advantages	Disadvantages	Status
Maternal Inheritance ⁸⁶	Prevent gene flow through outcrossing and volunteer seeds. Relatively well developed. Field tests indicate low incidence of sympatry and mixed stands extinct in three years. High level of transgene expression and no evidence for gene silencing or position effects.	Techniques to export protein are not yet available. Foreign proteins have not been targeted to ER for glycosylation.	Demonstrated in tobacco, potato, and tomato. Further development required to extend to other food crops.
Male Sterility ⁸⁷	Prevents outcrossing. Shelf-life of flowers may also be extended. Several tapetum-specific promoters available.	Crop needs to be propagated by crosspollination from non-GM crop or by artificial seeds. Potential for volunteer seed dispersal.	Demonstrated in tobacco and commercialized in glufosinate-tolerant rapeseed.
Seed Sterility	Controls both outcrossing and volunteer seed dispersal.	If transgene is silenced, introgression will occur. All linked genes should segregate together.	Terminator technology has not been demonstrated in the field. RBF demonstrated in tobacco.

⁸⁴ Henry Daniell, "Molecular Strategies for Gene Containment in Transgenic Crops," *Nature Biotechnology* 20, (June 2002): 582.

⁸⁵ See Henry Daniell's article "Molecular Strategies for Gene Containment in Transgenic Crops." *Nature Biotechnology* 20, (June 2002): 581-586 for a brief description of the following bioconfinement techniques.

⁸⁶ Recent controversy suggests that the use of chloroplast engineering involved in maternal inheritance may allow the transfer of transgenes to outcross. Daniell and Parkinson respond to this alleged problem by stating that even if transgenes are passed on to other plants, the transgenes will not be functional and consequently will not be able to alter phenotypic expressions. Henry Daniell and Christopher L. Parkinson, "Jumping Genes and Containment," *Nature Biotechnology* 21 (April 2003): 374-375.

⁸⁷ Male sterility may not be a viable option for bioconfinement since some transgenic varieties containing male sterility components have been found to outcross to other fully fertile GM crops at a higher rate and at greater distances than with conventional crops. This means that conventional isolation distances used to separate crops containing male sterility components from non-GM crops will have to be increased to avoid outcrossing between GM crops. Katie Eastham and Jeremy Sweet, *Genetically Modified Organisms (GMOs): The Significance of Gene Flow through Pollen Transfer* (Copenhagen, Germany: European Environmental Agency, 2002): 59. Available at http://reports.eea.eu.int/environmental_issue_report_2002_28/en/GMOs%20for%20www.pdf ; ViKtor Kuvshinov et al., "Molecular Control of Transgene Escape from Genetically Modified Plants," *Plant Science* 160 (2001): 518.

Table 1 (Continued)

Technique	Advantages	Disadvantages	Status
Cleistogamy	Pollination occurs before flower opens, theoretically preventing outcrossing.	Genes to modify floral design not readily available. In practice, introgression occurs despite self-pollination.	Not yet demonstrated in transgenic crops.
Apomixis	Seed is of vegetable origin and not from sexual cross. Controls both outcrossing and volunteer seed dispersal. Hybrid traits can be fixed.	Only known in a few crops. Genes not yet available.	Not yet demonstrated in transgenic crops.
Incompatible Genomes	Prevents recombination after pollination.	May not be applicable to crops that exhibit homologous recombination. Crops will not produce seed unless propagated with compatible plants.	Not yet demonstrated in transgenic crops.
Temporal and Tissue-Specific Control via Inducible Promoters	Gene either activated only when product is necessary or excised before flowering.	May not be applicable to traits required throughout the plant's life. If chemical treatment fails to penetrate plant tissues, residual levels of transgene may be present in pollen or seed that could be outcrossed.	Not yet demonstrated in transgenic crops.
Transgenic Mitigation	Neutral for crops but harmful for weeds.	Does not address gene flow and may force wild relatives to extinction.	Not yet demonstrated in transgenic crops.

Seemingly the main difference between Terminator Technology (seed sterility) and other bioconfinement methods is that the Terminator is the only method explicitly designed to restrict the usage of particular genetically modified plant varieties. Even though the other methods have not yet been touted as genetic use restriction technologies, they could be used for such a purpose. The main drawback to using terminator technology as a bioconfinement tool is that it may prove to be a “leaky” technology.⁸⁸ This means that the LEA (late embryonic abundance) promoter may become silenced. If the LEA promoter is silenced, the RIP (ribosomal inactivating protein) would not be produced at the end of the seed development, allowing the seed to grow and disperse its transgenes.⁸⁹ Also, when treating the seeds with tetracycline before being sold, the chemical may not induce the terminator construct, thereby permitting the seed to grow and propagate.⁹⁰

Once Terminator Technology is ready to be released from the laboratory, small-scale field tests that introduce limited numbers of transgenic crops should be conducted under conditions that minimize transgene flow so as to mitigate the widespread environmental and socioeconomic impacts.⁹¹ Furthermore, field-tests are essential to understanding how transgenic plants, including those containing the GURTs, will react once released into the natural environment.⁹² Laboratory studies, albeit very useful, cannot replicate the matrix of environmental conditions, and for this reason lab experiments are very limited in their predictive abilities.⁹³ Given that various crops disperse seed and pollen in different ways (some crops use vector insects and others rely on wind currents) each transgenic crop variety should be evaluated and field-tested on a case-by-case method.⁹⁴ A vast array of unforeseen negative consequences could result from testing a novel technology such as Terminator Technology on only one plant variety, which necessitates field-testing each crop variety before making it available for commercial use.

So, if GMOs continue to be used to increase the agronomic benefit of certain crops, then the most environmentally responsible method would include the use of some sort of bioconfinement mechanism. But, we have not yet answered the question that

⁸⁸ Mae-Wan Ho, Joe Cummins, and Jeremy Bartlett, “The Killing Fields Near You: Terminator Crops at Large,” *Institute of Science in Society Newsletter* 7/8 (February 2001). Available at <http://www.i-sis.org.uk/isisnews/i-sisnews7-16.php>. Katie Eastham and Jeremy Sweet, *Genetically Modified Organisms (GMOs): The Significance of Gene Flow through Pollen Transfer* (Copenhagen, Germany: European Environmental Agency, 2002): 59. Available at http://reports.eea.eu.int/environmental_issue_report_2002_28/en/GMOs%20for%20www.pdf.

⁸⁹ Henry Daniell, “Molecular Strategies for Gene Containment in Transgenic Crops,” *Nature Biotechnology* 20, (June 2002): 584.

⁹⁰ Manuela Giovannetti, “The Ecological Risks of Transgenic Plants,” *Rivista di Biologia / Biology Forum* 96 (2003): 218.

⁹¹ James M. Tiedje et al., “The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations,” *Ecology* 70, no. 2 (April 1989): 304.

⁹² L.L. Wolfenbarger and P.R. Phifer, “The Ecological Risks and Benefits of Genetically Engineered Plants,” *Science* 290 (December 2000): 2088-2093.

⁹³ James M. Tiedje et al., “The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations,” *Ecology* 70, no. 2 (April 1989): 306.

⁹⁴ James M. Tiedje et al., “The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations,” *Ecology* 70, no. 2 (April 1989): 307.

started this discussion: If Terminator Technology is implemented in commercial markets, will the outcrossing of the terminator gene render resource-poor farmers' crops sterile? That is, will terminator genes outcross to neighboring crops? Well, there is no evidence proving that terminator genes will act differently than other transgenes, suggesting that they too will outcross to neighboring crops.⁹⁵ But the actual environmental and socioeconomic consequences of terminator genes outcrossing has yet to be determined.⁹⁶ One thing is certain, though: Terminator genes will not necessarily destroy resource-poor farmers only means of subsistence and it will not inevitably imperil a nation's food security. It is not the case that, as the doomsayers imagine, a demoniac cloud of pollen spawned from terminator crops will drift across the land spreading the seed of destruction and sterility – the worst case scenario will not reach such catastrophic proportions. Granted, if the terminator genes do outcross and fertilize neighboring crops, unsuspecting farmers may be negatively affected, but such a situation would not completely destroy a resource-poor farmer's ability to grow a crop. The worst case scenario, according to Louwaars et al, suggests that 20 % (probably less) of a farmer's saved seed would not grow due to the introgression of the terminator gene, leaving the farmer with approximately 80% of her intended crop.⁹⁷

Even though this concern is very serious in that it may destroy farmers' only means of subsistence, the probability of this negative effect actually occurring due to the implementation of Terminator Technology may be very low given the numerous gene recombination events that would need to occur to produce sterile seeds in neighboring crops. Furthermore, if field tests prove that a significant number of compatible plant relatives neighboring transgenic crops produce sterile seeds, then redundant confinement tools may be necessary to prevent pollen drifts. This would require that in addition to a bioconfinement method such as seed sterility, a farmer would be required to implement physical barriers such as isolation zones and barrier crops. But, again, the effectiveness of such a redundant transgene confinement system would need to be field-tested before commercialized.

⁹⁵ Cullen N. Pendleton, "The Peculiar Case of 'Terminator' Technology: Agricultural Biotechnology and Intellectual Property Protection at the Crossroads of the Third Green Revolution," *Biotechnology Law Report* 23, no. 1 (2004): 13.

⁹⁶ According to Louwaars et al, "Farmers who produce their non-GURT crops adjacent to large areas of V-GURT fields of the same crop will face viability problems when using their own seed. In self-fertilizing crops like most cereals, pulses and cotton, cross fertilization rarely exceeds 2%, and viability losses will be negligible. Such minor reductions in seed viability are commonly compensated for by increased numbers of ears per plant in cereals and by increased leaf area per plant in legumes. Introgression in truly cross-fertilizing species (like maize and oilseed rape) may, however, go well beyond 20%, when small fields of local crops are surrounded by large areas of GURT crops. This will have a significant negative effect on crop yields." Niels P. Louwaars, Bert Visser, Derek Eaton, et al., "Policy Response to Technological Developments: The Case of GURTs," *Journal of New Seeds* 4, no. 1-2 (2002): 94. The actual percentage of inviable seeds produced in neighboring fields will depend upon the amount of pollen or seeds drifting, which is influenced by the plant species, plant variety, weather conditions, proximity of fields, etc. Martha L. Crouch, "How the Terminator Terminates," The Edmonds Institute, Edmonds, Wash., 1998. Available at <http://www.biotech-info.net/howto.html>.

⁹⁷ Niels P. Louwaars, Bert Visser, Derek Eaton, et al., "Policy Response to Technological Developments: The Case of GURTs," *Journal of New Seeds* 4, no. 1-2 (2002): 94.

Still, what if a worst case scenario obtained? Who, exactly, should be responsible for compensating the farmer's losses? The easy answer is the MAC that created and commercialized the product.⁹⁸ It seems reasonable for the MAC to be held at least partially responsible for the products it produces. If this assertion is acceptable, then it would also be reasonable to require MACs to help support food aid organizations that would respond to resource-poor farmers' needs in the case that even a small percentage of their crops fail to grow. I understand that many resource-poor farmers are living on the razors edge of existence, and any decrease in crop production may send them into a downward spiral. Granted there are numerous variables that contribute to decreased crop production in a given season such as unfavorable weather conditions, climate changes, insect infestations, etc. All of these in isolation may have a negligible affect on crop production, making it very difficult for a particular resource-poor farmer to point her finger at Terminator Technology, which may only cause a 2% decrease in yields, as the cause of her low crop yield. It still stands to reason that if MACs realize (after conducting field-tests) that the commercialization of Terminator Technology has a relatively high probability of negatively affecting neighboring crops, even at a very low percentage, the MACs have a moral obligation to mitigate the suffering that their products may cause.

Additionally, there are some serious concerns associated with the potential implementation of Terminator Technology such as the possible isolation of genepools used within the seed industry. Throughout most of the world, there are two distinct but interacting seed delivery systems: the formal seed supply sector, which is comprised of international breeders and private national breeders (both are typically regulated by governments), and the informal seed supply sector, which predominantly consists of cooperative relationships formed between farmers breeding their own seeds.⁹⁹ Due to the current absence of an absolutely effective method of protecting intellectual property, genetic material that is improved by one sector finds its way into the other sector which is then used to make improvements to certain varieties. Without the use of Terminator Technology both sectors are able to use one another's germplasm to improve their own. Once Terminator Technology is implemented in the commercial seed industry the international breeding companies and the national breeders will be able to control the usage of their respective germplasm, which will most likely result in the formal and informal seed sectors becoming more isolated from one another. The local farming operations that breed their own seeds, and typically lack the financial resources to purchase seeds from the formal seed sector, are most likely to be harmed by such

⁹⁸ But, what if the farmer using this product did not adhere to the terms of proper use such as creating an isolation zone or implementing some means of physical confinement that would further minimize the probability of outcrossing? Currently there are no such proper use terms associated with GURTs, but as with any risky technology the agent using the product must also assume at least partial responsibility for any ill effects that using the product may cause. However, this issue takes the discussion too far afield, for such a discussion would require an extensive explanation of product liability.

⁹⁹ Derek Eaton, et al., "Economic and Policy Aspects of 'Terminator' Technology," *Biotechnology and Development Monitor* 49 (2002): 19-22; Food and Agriculture Organization of the United Nations, "Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 6.

isolation.¹⁰⁰ While this would be a negative consequence of implementing Terminator Technology, especially in developing countries, the innovation-absorption gap between the formal and informal sectors could effectively be reduced by increased investments in public plant breeding initiatives.¹⁰¹

To more accurately determine the impact that Terminator Technology may have on farming systems we must determine the level of input that a particular farming system uses, since the higher dependence on purchased inputs renders a particular farming system more likely to encounter this technology. In our modern world, farming has evolved from a subsistence activity to a commercial enterprise which has led to the need for an increasing amount of agricultural inputs in order to maximize the yield of certain crops.¹⁰² Within the global agricultural industry there are at least three general classifications of farming systems: high-intensity farming systems, which depend heavily on the formal seed sector for all inputs; medium-intensity farming systems, which depend partly on the formal seed sector but depend mostly upon the informal seed sector; and low-intensity farming systems, which depend highly on the informal seed sector.¹⁰³ Currently, in developing countries, medium-intensity farming accounts for the majority of agricultural production, low-intensity farming systems account for most of the remainder of the production, and high-intensity farming systems currently account for a relatively small amount of the production.¹⁰⁴ Both medium- and low-intensity farming systems are considered “resource-poor” farming systems since both are dependent (to various degrees) on the informal seed sector and lack the economic means to rely on the formal sector for their agricultural inputs.¹⁰⁵ Medium-intensity farming systems are most susceptible to the potential negative impacts of the implementation of Terminator Technology (such as decreased yields in subsequent years) since they are only partially dependant upon the formal seed sector and typically could not afford to purchase seed each year. These farmers might be forced to develop a greater dependence on the formal seed sector if Terminator Technology were to be widely implemented since using terminator seeds may initiate a cycle of perpetual annual seed purchases. Again, the medium- and low-intensity farming systems in developing countries could be insulated from the negative economic impacts of the implementation of Terminator Technology by initiatives designed to increase investments in public plant breeding, thereby granting these farmers an alternative to dealing with the formal seed supply sector.¹⁰⁶

Additionally, the application of Terminator Technology will be confined to crops that are currently being genetically modified. That is, not all crops are targets for this

¹⁰⁰ Derek Eaton, et al., “Economic and Policy Aspects of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 49 (2002): 19-22.

¹⁰¹ Food and Agriculture Organization of the United Nations, “Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 5.

¹⁰² Derek Eaton, et al., “Economic and Policy Aspects of ‘Terminator’ Technology,” *Biotechnology and Development Monitor* 49 (2002): 19-22.

¹⁰³ Food and Agriculture Organization of the United Nations, “Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 6-7.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid., 7.

¹⁰⁶ Ibid., 6-7.

technology, only those crops that are significantly modified and patented by agrochemical corporations (e.g., wheat, soybeans, and cotton) will be imbued with terminator genes.¹⁰⁷ Given that genetically modified varieties are typically much more expensive than seeds purchased from the informal seed sector, many medium-intensity farmers, and probably all low-intensity farmers, will not be able to purchase seeds possessing the terminator gene. There is concern, though, that if improperly controlled, the terminator seeds could leak into the informal seed sector reeking havoc for resource-poor farmer. However, if a sufficient public plant breeding system is in place, farmers who inadvertently sow “suicide seeds” would be able to replenish their seed stores in subsequent years.¹⁰⁸

Since the implementation of Terminator Technology has not yet been proven to instantiate an unnecessary gain for MACs nor that it is illegitimately destructive to the farmers, MACs have yet to be proven deserving of the moral condemnation given them by activist groups such as the ETC group. As long as farmers are able to make an informed, autonomous choice to use terminator seeds they would not necessarily be deprived of their right to subsistence merely by using terminator seeds.

So, even though many activist groups adamantly claim that MACs have a duty to respect the right of farmers to save the seeds of their harvest, even if it is the case that the MACs have invested more time and resources into the production of certain varieties of seeds, such a right does not actually exist. If such a right is found to be morally justifiable, it has yet to be proven that MACs have a direct, moral obligation to protect this right of farmers.

¹⁰⁷ Actually, not all patented varieties will have the terminator gene since some hybrid varieties can be controlled through other “natural” mechanisms. Food and Agriculture Organization of the United Nations, “Potential Impacts of Genetic Use Restriction Technologies (GURTs) on Agricultural Biodiversity and Agricultural Production Systems, (Rome: 2001), 4.

¹⁰⁸ In a worse-case scenario, a particular resource-poor farmer would sow a complete crop of “suicide seeds”, save some of her harvested seeds for the subsequent year’s crop, and, in the next season, find out that the sown seeds are sterile. I understand that such a situation could possibly financially devastate a resource-poor farmer. However, the probability of such a situation actually occurring must be researched before we can use such a scenario to completely oppose the implementation of Terminator Technology.

Chapter 4: Exploitation

Even though MACs will not be infringing upon farmers rights through the potential implementation of Terminator Technology in the commercial seed industry, it may still be the case that MACs could use this technology to effectively reduce resource-poor farmers to indentured servants, toiling to maximize profits for their corporate slave-masters. The main question that will be addressed in this chapter is: Could the potential implementation of Terminator Technology be used by MACs to wrongfully exploit resource-poor farmers? In order to answer this question, I will first offer an in-depth discussion of what wrongful exploitation is and the necessary conditions for a situation to be wrongfully exploitative, which will include an explanation and critique of Judith Tormey's account of exploitation.

Next, I will apply my conception of wrongful exploitation to the potential implementation of Terminator Technology. And finally, I will list the necessary conditions that must be met in order for the implementation of Terminator Technology to be accurately considered wrongfully exploitative. The main point that I will defend in this chapter is that the implementation of terminator technology is not necessarily wrongfully exploitative, but may become so if MACs illegitimately capitalize on farmers' vulnerabilities through the use of deceptive marketing schemes.

By way of explanation, I use Tormey's account of exploitation not necessarily because it is the most robust theory of exploitation. Instead, Tormey's view is useful since her succinct conditions for exploitation seem to capture some very important aspects of exploitative relations (as will be demonstrated below). Furthermore, her view does not smack of a moralized account of exploitation as does Alan Wertheimer's view. Exploitation, as Wertheimer conceives of it, is always immoral. Alan Wood, on the other hand, understands exploitation to be a mere permutation of use, which does not necessarily connote wrongful use. In the present project, I intend to tease out distinct situations that involve using persons as a means to an end and those that involve using persons *merely* as a means to an end.

It is pragmatically incorrect to deem it morally wrong for one *to make productive use of* (exploit) one's own talents or those of others in the pursuit of some legitimate goal. Exploiting one's own talents or those of others is necessary in most forms of uncoerced cooperation. For instance, when an employer exploits his labor force in order to maximize productivity, he does not necessarily treat his employees in an immoral manner. If the employer takes unfair advantage of his employees by using their vulnerabilities against them, and benefits from such an enterprise, then he may be guilty of wrongful exploitation.

The major peril of espousing a moralized conception of exploitation is that claims such as "Donald's exploitation of his interns is wrong" become vacuous even though they may be true. In other words, moralized accounts of social concepts require that at least one truth condition describing such concepts be moral, rendering the need for further moral analysis redundant.¹⁰⁹ So, if I were to appeal to Wertheimer's account of

¹⁰⁹ Denis G. Arnold, "Exploitation and the Sweatshop Quandary," *Business Ethics Quarterly*, vol. 13 (2003): 246.

exploitation, I could justifiably dispose of the following exegesis and defense of Judith Tormey's account of exploitation; however, I intend to defend an empirical notion of exploitation, which will require a defense of my moral position.

Additionally, the respective accounts of Wood and Tormey appear to have much in common in that Tormey's conditions for exploitation essentially capture Wood's main explicative points regarding both non-moral exploitation and immoral exploitation. The main reason that I appeal to Tormey's account instead of Wood's is that Tormey makes explicit the distinction between exploitation and oppression. Within the field of the terminator debate, one can easily be confused by the language used by activist groups in their attempt to articulate exactly what it is they find wrong with Terminator Technology. That is, one may wonder which term actually applies: exploitation or oppression. In an attempt to unearth a distinctive argument for why Terminator Technology is wrong from the activists' perspective, the (potentially) exploitative relation formed between MACs and resource-poor farmers appeared to be a more tangible project than that of the oppressive nature of Terminator Technology. The latter project would have required taking to task much more than the relationship formed between MACs and farmers, which seems to be too ponderous a project for a master's thesis.

So, Tormey's account of exploitation appears to be the most pragmatically useful in dealing with the terminator debate, since: 1) it is not a moralized account, thereby allowing me to avoid the pitfalls associated with such accounts; and 2) it offers greater detail than Wood's account in that her conditions for exploitation are clearly defined, which makes easy the distinction between exploitation and oppression.

Section 4.1: Judith Tormey's Conception of Exploitation

Exploitation and oppression are terms that are sometimes used synonymously insofar as both loosely refer to an abusive relationship between two parties resulting in one party being treated unfairly. In an attempt to avoid stretching the meanings of both terms so far as to render them vacuous, we can make a simple but important distinction between exploitation and oppression. Oppression appears to affect people without necessarily involving a rational oppressor and furthermore, oppressors may not gain from oppressive relations.¹¹⁰ For example, people can be oppressed by the economy without any group of individuals *intending* this state of affairs to obtain. Exploitation, on the other hand, requires an intentional act: one that necessarily results in gains for the exploiter.¹¹¹ Even though there is a close relationship between exploitation and oppression, since many forms of oppression appear to facilitate exploitative relationships between groups, not all cases of exploitation include oppressive relations.¹¹²

¹¹⁰ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 217; Alan Wertheimer, *Exploitation*, (New Jersey: Princeton University Press, 1996), 18.

¹¹¹ This contentious claim will be further explained in this section below.

¹¹² Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 206; Alan Wertheimer, *Exploitation*, (New Jersey: Princeton University Press, 1996), 18.

To begin, Judith Tormey offers a set of conditions for the existence of exploitation. These conditions seem reasonable since they help to point out the obvious cases of exploitation. In her article "Exploitation, Oppression and Self-sacrifice," Tormey claims that there are four conditions for exploitation to occur.

Condition 1 (EC₁): Exploitation is a 3 term relation which requires a person or group of persons for at least one of the terms. More specifically, the *exploiter* must be a person or group of persons.

Condition 2 (EC₂): Exploitation necessarily involves benefits or gains of some kind to someone [unlike oppression which may exist without anyone's gaining from it].

Condition 3 (EC₃): Exploitation resembles a zero-sum game, viz. what the exploiter gains, the exploitee loses; or, minimally, for the exploiter to gain, the exploitee must lose. [When the environment is the object of exploitation, this is commonly characterized as depletion.]

Condition 4 (EC₄): When the exploitee is a person, exploitation requires a violation of principles of fairness consisting in either a disregard for the exploitee's interests or an infringement of the exploitee's rights.¹¹³

Exploitation, according to Tormey, is a relation that does not necessarily happen only to people, since it is possible to exploit non-sentient things such as the environment, but that which exploits must be a person or group of persons.¹¹⁴ She believes this condition to be mildly controversial since some acts of exploitation are unintended by the group that ultimately gains from the exploitative relationship and thereby seems to not require that the exploiter be a person. Tormey offers two reasons supporting her claim that the exploiter must be a person.

The first reason that the exploiter must be a person is that "exploitation requires a conscious project resulting in planned benefits or gains."¹¹⁵ This is not to say that one must consciously set out to exploit a person or thing, but merely intend to gain from one's relation with the person or thing. Since exploitation may be an unintended consequence of one's actions, it is not necessary that a person intend to exploit something or someone in order to be considered an exploiter. Tormey says, "One could intentionally *use* persons or things for the sake of one's own gain (without regard for their interests in the case of persons) and so exploit, without it being true that one sets out intentionally to *be* an exploiter."¹¹⁶ In other words, one can be an exploiter without realizing that he is, in fact, exploiting something or someone. Let's use a young man by the name of Chad to clarify this point. (For argument's sake, let's assume that the shoe company Kicks exploits its Indonesian workers in order to provide the world with Kicks products while making an economic profit.) Chad purchases a pair of Air Kicks from a

¹¹³ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 207-208.

¹¹⁴ Allen Wood makes a similar claim by saying, "The exploiter must be a person or group of people, a human or human-like subject, with the capacity for setting ends and using means...." Allen W. Wood, "Exploitation," *Social Philosophy and Policy* 12 (1995): 141.

¹¹⁵ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 209.

¹¹⁶ *Ibid.*

local sporting goods shop while unaware that Kicks exploits its third-world employees in order to produce Air Kicks shoes. He is not consciously supporting Kicks' unethical practices in Indonesia; instead all Chad really wants is to enjoy the benefits of having a new pair of Air Kicks. In effect, on Tormey's account, Chad is exploiting Kicks' Indonesian employees since he uses Kicks and its employees in order to provide the Air Kicks that he intends to enjoy, even though he did not *intend* to exploit these workers.¹¹⁷

The second reason that an exploiter must be a person is due to the close connection between exploitation and the conscious act of selfishness.¹¹⁸ For example, person A acts selfishly when he *ignores* the interests of others involved in a situation that is beneficial to him even though the interests of others are morally considerable, or he gives their interests some consideration but fails to grant them their proper moral weight.¹¹⁹ According to Tormey, it is incorrect to think that persons can act selfishly toward those beings or objects that do not have interests.¹²⁰ This point suggests that exploitation does not always involve selfish behavior since persons can exploit the natural environment, through the depletion of natural resources, even though the environment has not been proven to have interests. Although selfishness does not always accompany exploitation, Tormey acknowledges that it is often a part of exploitation. In those cases when exploitation involves persons, the exploitee is used as an instrument in a project intended to result in gains for the group or person responsible for the exploitation.¹²¹ In such a case the exploitee's interests (in the case of persons) are ignored while she is being treated merely as a means to the exploiter's end, and thereby treated in a selfish manner.

Tormey claims in EC₂, "There can be no exploitation without gain."¹²² Essentially, Tormey is suggesting that in order for the state of exploitation to obtain, the exploitative project must be designed to result in gains for the exploiter, and those gains must be realized by the exploiter.¹²³ She points out a fine distinction between exploitative and non-exploitative projects by saying,

...exploitation characteristically implies more than casual or accidental gain. A person does not exploit nature if he/she goes out on a lark, pans for gold and happens to find some. Nature is exploited, however, if a shaft is sunk and a successful mine is put into operation.¹²⁴

¹¹⁷ I will critique this condition in the following section of this chapter.

¹¹⁸ In a footnote on page 221 of "Exploitation, Oppression, and Self-Sacrifice," Tormey refers to the OED's definition of 'exploitation': "'The action of turning to account for selfish purposes, using for one's own profit;' and 'exploit': '...to treat selfishly as mere workable material (persons, etc.).'" I will respond to Tormey's claim that selfishness is closely associated with exploitation in the following section.

¹¹⁹ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 210.

¹²⁰ *Ibid.*

¹²¹ *Ibid.*

¹²² *Ibid.*

¹²³ *Ibid.*, 210-211.

¹²⁴ *Ibid.*, 209. For the sake of clarification, when one exploits nature by digging a successful mine, one is not, at the same time, acting selfishly toward nature since nature has not yet been proven to have interests.

As a result, something or someone is not exploited in all cases where a person benefits or experiences some gain through an interaction with a thing or person, i.e. not every use is an instance of exploitation. For example, when a hiker fills her canteen up in a stream that she happened upon while hiking is not an instance of exploitation, but a farmer who reroutes a stream so that it flows through his pasture and waters his cattle is a case of exploitation.¹²⁵ The main difference between the hiker and the farmer is that the hiker does not manipulate or change the stream in any significant way in order to gain refreshment, whereas the farmer significantly alters the stream to serve his intended purposes.¹²⁶ So, for exploitation to occur, one must intend to use something or someone as an instrument in her/his project that necessarily results in some benefit to her/him.¹²⁷

Another condition of exploitation, EC₃, states that exploitation necessarily involves not only some gain for the exploiter but some corresponding loss for the exploitee.¹²⁸ This third condition is offered to help distinguish exploitative relationships from relationships of mutual compensation and fair exchange, where the latter relationships entail that the interests of all participants have been appropriately considered. In EC₃, Tormey suggests that exploitation resembles a zero-sum game resulting in the exploitee losing what the exploiter gains. But as Alan Wertheimer argues, not all cases of exploitation need be characterized as a “zero-sum game” since some cases of harmful exploitation result in the exploitee’s loss being greater than the exploiter’s gain.¹²⁹ In the case of sweatshop workers, many lose priceless things such as their health and even their lives while the owners/operators of the sweatshops gain monetarily (the former seems to be a much greater loss than the latter gain). Even though Tormey suggests that exploitation is a zero-sum game, she says that it merely *resembles* a zero-sum game and that, in such cases, exploitation at least results in the exploiter gaining from a relationship that causes the exploitee to lose.¹³⁰ Considering this latter interpretation of Tormey’s account, Wertheimer actually agrees with Tormey as he claims that exploitation necessarily involves the exploiter benefiting from the exploitee.¹³¹ So, exploitation requires that the exploiter’s relation with the exploitee must result in some gain to the exploiter and some corresponding loss to the exploitee.

What about cases of mutual exploitation, wherein each party benefits from the others’ loss? Are these cases of fair exchange or mutual benefit? Consider a married

¹²⁵ Allen Wood uses a similar example on page 141 of his article “Exploitation.”

¹²⁶ Allen Wood makes a point similar to Tormey’s in the current paragraph by saying, “We do not exploit unpredictable opportunities or fortunate circumstances, but in those cases the opportunity or circumstance fits into some preexisting plan of the exploiter’s, and the exploiter must do something, involving a degree of planning and manipulation, to take advantage of the fortunate circumstances, bringing it into the exploiter’s control or within the purview of the exploiter’s plans or machinations. When some unpredictable event suddenly drops success into my lap, I make use of the good luck, but I did not exploit it.” Allen W. Wood, “Exploitation,” *Social Philosophy and Policy* 12 (1995): 142.

¹²⁷ Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 211; Allen W. Wood, “Exploitation,” *Social Philosophy and Policy* 12 (1995): 141-142.

¹²⁸ Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 211.

¹²⁹ Alan Wertheimer, *Exploitation* (Princeton: Princeton University Press, 1996), 18.

¹³⁰ Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 207-208.

¹³¹ Alan Wertheimer, *Exploitation* (Princeton: Princeton University Press, 1996), 17.

couple, Norv and Leslie, for instance.¹³² (In this example both Norv and Leslie fulfill traditional gender roles where the man is the head of the household, resulting in him having disproportionately more decision-making power than the housewife, Leslie. Due to the nature of traditional gender roles, Norv and Leslie are not starting from equal bargaining positions.) Norv has a demanding job as a farmer and Leslie stays home to take care of the house and children. When Norv comes home from work he plops himself in front of the TV and refuses to be bothered. Leslie on the other hand complains to Norv about not helping around the house enough. Norv sees himself as being exploited by Leslie since he has to earn a living as a farmer working long grueling hours for relatively little compensation. And Leslie feels that she is being exploited by Norv since she bears a disproportionate burden of the household chores. As a result, Norv exploits Leslie relative to household chores, and Leslie exploits Norv relative to not having to deal with the stress of earning a living for the family. The relationship between Norv and Leslie is one of mutual exploitation and is not the same as fair exchange since the latter requires that the interest of both parties be given adequate consideration from the beginning of their relation.¹³³

Tormey offers one final condition of exploitation: "Principles of fairness are violated in the exploitation of persons."¹³⁴ EC₄ is needed to distinguish fair zero-sum games from unfair zero-sum games. Tormey uses poker, as a zero-sum game, to exemplify this fourth condition of exploitation. A game of poker is considered fair when the winners of the game gain the money that the losers lost, without deception or fraud. In this first case, the interests of all players are being considered, i.e. no one seeks to take unfair advantage of the other players, and all players freely consent to their real or potential losses. When playing poker with a hustler (who either cheats, by hiding cards, or lures his opponents into the game by misrepresenting his poker skills), this zero-sum game becomes unfair since the hustler ignores or discounts the interests of the other players in order to win, i.e. he takes unfair advantage of the other players' vulnerabilities.¹³⁵ In this case, the hustler is not playing by the rules of the game and he exploits his opponents insofar as he disregards the rules of fair play. In Tormey's words, "The exploiter manipulates (uses) them for his own gain and violates their right to fair

¹³² The following example is similar to the one that Tormey uses in her article, "Exploitation, Oppression, and Self-Sacrifice," p. 211-212.

¹³³ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 212-213. Even though EC₃ requires that the exploiter gain from the exploitee's loss, it leaves open the possibility that the exploiter and the exploitee may gain from the exploitative relation. In such a relation the exploiter gains disproportionately more than the exploitee, but nonetheless both gain from the relation. Such an exploitative relation is considered, by Alan Wertheimer, to be "mutually advantageous exploitation."

¹³⁴ *Ibid.*, 213.

¹³⁵ *Ibid.* Allen Wood appears to agree with Tormey's distinction between fair and unfair zero-sum games. Wood makes an analogous distinction between innocent and noninnocent exploitation. Continuing on with Tormey's example, the winner of a poker game innocently exploits her opponents' weaknesses since she did so without deception or fraud. As for the hustler, he can be considered to be noninnocently exploiting his opponents' weaknesses since he has done so in a fraudulent or inappropriate manner. Allen W. Wood, "Exploitation," *Social Philosophy and Policy* 12 (1995): 138.

treatment.”¹³⁶ That is to say, the autonomy of the hustler’s opponents is being disrespected since they could not rationally and freely consent to playing a game that would grant the hustler disproportionately more benefits relative to the other players. This example demonstrates that persons are exploited when their interests are ignored or discounted in such a way that they are treated as a mere means to some end.

So, to pull all of Tormey’s conditions together: in order for an exploitative relation to exist, 1) the exploiter must be a person or group of persons, 2) the relation must involve gains of some kind to the exploiter,¹³⁷ 3) the exploiter must gain from the exploitee’s loss, and 4) when the exploitee is a person, that person’s interest must be ignored or discounted by the exploiter so as to treat the exploitee merely as a means to the exploiter’s end.

Section 4.2: Fortifying Tormey’s View

At this point, Tormey seems to have constructed a reasonable account of exploitation, but she has failed to substantiate her implicit claim that all exploitative relations are *morally wrong*, at least when persons are the object of exploitation.¹³⁸ That is, she does not make explicit the distinction between exploitation as referring to mere *use* (as seen in EC₁₋₃) and exploitation as the wrongful treatment of persons (as in EC₄). Allen Wood comments on the common pejorative usage of the term “exploitation” in his article “Exploitation.” Wood claims that it has been a fault of philosophers, who explore the real or potential incidents of exploitation, to rely on a dictionary definition to help make the distinction between the non-moral and moral sense of exploitation.¹³⁹ He calls the pejorative treatment of this term a “moralized” account of exploitation since these philosophers incorrectly understand “exploitation” to be inherently evil.¹⁴⁰ For example, “exploitation” and “murder” are treated similarly in that both are understood to be morally wrong independent of the context in which they each occur. But this, according to Wood, is incorrect since “murder” is defined as “wrongful homicide” whereas “exploitation” is merely a variation of the word “use” and does not *necessarily* denote

¹³⁶ Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 213. Tormey appeals to rights when explaining her understanding of wrongful exploitation. She claims that when an exploiter manipulates his victim for his own gain, he violates the victim’s “right to fair treatment.” This is a weak appeal to “rights” since she does not offer any justification for such a right.

¹³⁷ Even though Tormey explicitly states in EC₂ that “Exploitation necessarily involves benefits or gains of some kind to someone...,” she implies on pp. 210-211 that the gains must be experienced by the exploiter and not just any person. It seems reasonable to suggest that even if the exploiter is not the direct recipient of the gain in an exploitive relation, he must plan to benefit in some way (even if circuitously) through exploiting a person or thing. Based on this reasoning, I have amended EC₂ by replacing “someone” with “the exploiter.”

¹³⁸ Judith Tormey claims that EC₄ “explains the heavily negative moral connotations exploitation has when it applies to relations between persons.” Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 207.

¹³⁹ Allen W. Wood, “Exploitation,” *Social Philosophy and Policy* 12 (1995): 137.

¹⁴⁰ *Ibid.*

wrongful use. So, to claim that X is wrong *because* it is exploitative actually begs the question.

Tormey's account of wrongful exploitation (i.e. exploitation of persons) appears to be somewhat Kantian since she appeals to Kant by saying, "That the exploitation of persons can be interpreted as a violation of several formulations of Kant's Categorical Imperative will have become evident at this point, and this helps to explain the heavily negative moral connotations of the concept when it applies to relations between persons."¹⁴¹ Given her usage of Kant (albeit very limited), it seems reasonable to interpret her account of wrongful exploitation through a Kantian lens. As a result, it seems that Tormey essentially believes that exploitation is wrong when persons are used merely as a means to the exploiter's end, i.e. when Kant's respect for persons principle is violated.

Well then, what exactly does it mean to use someone as a mere means to an end? Ronald M. Green understands there to be at least three different interpretations of what it means to treat someone as a mere means. Only the third of these is relevant to the present discussion.¹⁴² Green's third interpretation of Kant's "end-in-itself formula" is what he calls the "impartial co-legislation" interpretation. Accordingly:

...persons are used as 'means only and not as ends,' when they are treated in ways they could not accept under conditions of informed, impartial, and rational choice as a rule of conduct for everybody (including themselves). It follows from this that to treat persons 'as ends in themselves' is to respect, not their actual willing, but their 'noumenal' or morally legislative impartial willing.¹⁴³

As indicated in the above quotation, Kant's respect for persons principle essentially has two parts: 1) Act in such a way that you never treat humanity simply as a means; and 2) act in such a way that you always treat humanity as an end in itself.¹⁴⁴ To merely fulfill 1 does not necessarily mean that persons will be treated in ways that respect their humanity. That is, 1 may be interpreted as a negative duty, non-interference, which, if strictly adhered to, may cultivate a disposition of indifference toward humanity in others.¹⁴⁵ To guard against indifference toward persons, we are to not only avoid treating

¹⁴¹ Judith Tormey, "Exploitation, Oppression, and Self-Sacrifice," *Philosophical Forum* 5 (1974): 213.

¹⁴² Ronald M. Green, "What Does it Mean to Use Someone as 'A Means Only': Rereading Kant," *Kennedy Institute of Ethics Journal* 11, no. 3 (2001): 247-261. Green's first interpretation of Kant's end-in-itself formula focuses on "offenses against reasoned willing," and his second interpretation is what he calls the "dignity/integrity" interpretation. The first two interpretations are tangential to the current discussion, whereas the third (used above) deals specifically with the question: what does it mean to use someone merely as a means?

¹⁴³ Ronald M. Green, "What Does it Mean to Use Someone as 'A Means Only': Rereading Kant," *Kennedy Institute of Ethics Journal* 11, no. 3 (2001): 254.

¹⁴⁴ Thomas E. Hill, Jr., "Humanity as an End in Itself," *Ethics* 91, no. 1 (1980): 87.

¹⁴⁵ William K. Frankena, "The Ethics of Respect for Persons," *Philosophical Topics* 15, no. 2 (1986): 153; Thomas E. Hill, Jr., "Humanity as an End in Itself," *Ethics* 91, no. 1 (1980): 87.

them as mere means but also to always treat humanity as an end in itself.¹⁴⁶ That is, we should treat persons in ways that they could accept under conditions of informed, impartial, and rational choice as a rule of conduct for everybody, including themselves (let's call this *acceptance under purely rational conditions*).¹⁴⁷

But, why do we have a moral obligation to treat persons as an ends in themselves? Before we can directly answer this question, we need to understand the difference between subjective (or relative) ends and objective ends. According to Kant, "The subjective ground of desire is *incentive*; the objective ground of volition is a *motive*; hence the distinction between subjective ends, which rest on incentives, and objective ends, which depend on motives, which hold for every rational being. Practical principles are formal if they abstract from all subjective ends, whereas they are material if they have put these, and consequently certain incentives, at their basis."¹⁴⁸ From Kant's perspective, we can see that persons set for themselves various ends which they subjectively value, and different persons may or may not value one another's individual ends; these are considered by Kant to be relative ends since they are based on sensuous impulses. Relative ends, unlike objective ends, can be substituted by other ends, i.e. they have a price. Persons may take up or abandon particular ends depending on the utility that a particular end produces. After completing this thesis, I can either choose to continue on toward a Ph.D. in philosophy or venture out into the workforce to secure a decent paying job. These two ends are relative to my subjective inclinations, I can decide to choose which end to pursue based on the pleasure, fulfillment, or utility that I seek to gain – these ends are instrumentally valuable.¹⁴⁹ However, objective ends are valuable regardless of the utility they produce since they are not based on inclination but reason. Objective ends are irreplaceable: there is no other end that is of equal value which can take the place of an objective end. So, relative ends, as Kant indicates, are accepted or rejected based on incentive whereas objective ends are valid and necessary for all rational agents regardless of the incentive attached to them.¹⁵⁰

The moral law is grounded in volition, and it alone (without the influence of any other motivating force) is able to determine the will of all rational beings, and therefore is a motive and not an incentive. Given that the moral law is a motive, it is an objective end, which presents itself as valuable to every rational being, and is, thereby, intrinsically valuable. Persons, insofar as they are rational beings, are co-legislators of the moral law. Being co-legislators of the moral law, persons are the loci of the moral law. Therefore, Kant infers that insofar as persons are rational agents, they are objective ends which are to be treated as ends in themselves.¹⁵¹

¹⁴⁶ Thomas E. Hill, Jr., "Humanity as an End in Itself," *Ethics* 91, no. 1 (1980): 87; Immanuel Kant, *Groundwork of the Metaphysics of Morals*, ed. Mary Gregor (Cambridge: Cambridge University Press, 2000), 45.

¹⁴⁷ Ronald M. Green, "What Does it Mean to Use Someone as 'A Means Only': Rereading Kant," *Kennedy Institute of Ethics Journal* 11, no. 3 (2001): 254.

¹⁴⁸ Immanuel Kant, *Groundwork of the Metaphysics of Morals*, ed. Mary Gregor (Cambridge: Cambridge University Press, 2000), 36.

¹⁴⁹ *Ibid.*, 37.

¹⁵⁰ *Ibid.*, 36.

¹⁵¹ *Ibid.*, 37.

To treat persons as ends in themselves is to respect the moral law that is represented by their rational nature. The term “respect” in this situation is not always clearly understood. According to Kant, respect for the moral law is a feeling produced by an intellectual cause, and not by a “pathological” one.¹⁵² That is, this is a feeling of the absence of “pathological” inclinations. Since this feeling is produced by freeing the will of all “pathological” inclinations, and thereby allowing the moral law to determine the will, it is a moral feeling.¹⁵³ Respect for the moral law, then, is a moral feeling that applies to persons only, for persons are the loci of the moral law.¹⁵⁴ The feeling of admiration, which is a pleasant disposition toward a certain person (or group of people) either due to her accomplishments or even perceiving her as an exemplar of the moral law, may well be confused with the feeling of respect.¹⁵⁵ We can admire persons for perfecting their talents (as we do sports heroes) and for refining their virtuous character (as we do humanitarian such as Mother Teresa). However, the feeling of admiration is based on incentive and the feeling of respect is based on motive, and neither of these ways of admiring persons is equivalent to the respect we owe to them as co-legislators of the moral law. So, the respect that we owe to persons (as loci of the moral law) when we treat them as ends in themselves is not a merit based respect, but a respect that is based on a moral feeling (respect for the moral law) which is binding on every rational being.

Exploitation, then, is wrong, in my view, because it violates Kant’s respect for persons principle: the exploiter treats the exploitee merely as a means to his end. I agree with Tormey in that wrongful exploitation *necessarily* includes ignoring or discounting the interests of the exploitee since the exploitee is being treat as a mere means. Similarly, from a Kantian perspective there are at least two reasons why treating persons selfishly (by ignoring or discounting their interests) is wrong: 1) The selfish agent is not properly respecting the moral law (represented by persons), and 2) the selfish agent prevents the exploitee from being able to free her will from sensuous inclinations. According to Tormey, acting selfishly is to ignore the interests of others or at least be indifferent to them. Such interests, from a Kantian perspective, cannot refer to interests in increasing pleasure or avoiding pain. Instead such interests must be, first and foremost, concerned with the moral law.¹⁵⁶ For one’s will to be free, according to Kant, one must remove all sensuous inclinations from one’s will. Moreover, the will must be self-determined and not determined by any sensuous impulses, for all sensuous inclinations are antagonistic to the moral law.¹⁵⁷ If, A treats B selfishly, and while being treated selfishly B’s moral interests are frustrated by causal necessity, then A is treating B as a thing and not as a

¹⁵² Immanuel Kant, *Critique of Practical Reason*, 3rd ed. trans. Lewis White Beck, (Upper Saddle River, NJ: Prentice Hall, 1993), 77. The term “pathological” refers to the emotions and passions and is not meant to refer to disease.

¹⁵³ Immanuel Kant, *Critique of Practical Reason*, 3rd ed. trans. Lewis White Beck, (Upper Saddle River, NJ: Prentice Hall, 1993), 78.

¹⁵⁴ *Ibid.*, 80.

¹⁵⁵ *Ibid.*, 81; Immanuel Kant, *The Doctrine of Virtue*, trans. Mary J. Gregor (Philadelphia: University of Pennsylvania Press, 1964), 116-117; William K. Frankena, “The Ethics of Respect for Persons,” *Philosophical Topics* 15, no. 2 (1986): 149-167.

¹⁵⁶ Immanuel Kant, *Critique of Practical Reason*, 3rd ed. trans. Lewis White Beck, (Upper Saddle River, NJ: Prentice Hall, 1993), 83.

¹⁵⁷ *Ibid.*, 73.

person. That is, if by being treated selfishly, B is also deprived of certain necessities, she is prevented (or at least inhibited) from removing sensuous impulses from her will since all B can focus on is having her basic necessities met. Kant regards this as causing B to live in a state of causal necessity.¹⁵⁸ It is not clear which interests Tormey believes are morally important. While interpreting her account of exploitation from a Kantian perspective, we can see that the only interests deserving of our direct moral consideration are moral interests. Therefore, not all interests are morally relevant from a Kantian perspective, the only interests that we are morally compelled to consider are those that allow or facilitate one's ability to act morally.¹⁵⁹

Reconsider the case of Norv and Leslie. This case may help to clarify the sorts of interest that deserve direct moral consideration, from a Kantian perspective, in situations of wrongful exploitation. According to Tormey's conditions for exploitation, the relationship existing between Norv and Leslie is one of mutual exploitation and not one of fair exchange.¹⁶⁰ The latter requires that both A and B receive adequate consideration for their respective interests, and when both receive such treatment neither is exploited. However, for an exploitative relation to exist, A must treat B "unfairly."¹⁶¹ Norv, according to Tormey's account, is exploited by Leslie relative to working outside the home and Leslie is exploited by Norv relative to household chores. Neither is giving the other's interests proper consideration. But, it is not explicitly clear what sort of interests Tormey believes to be morally considerable in this situation. I suppose that, from Tormey's perspective, Norv should help fulfill Leslie's interests in having more assistance around the house, and Leslie should help to fulfill Norv's interest in having some help supporting the family. Yet, from a Kantian perspective, such interests are not necessarily moral interests and ignoring or discounting such interests does not violate respect for persons. So, merely having one's interests ignored or discounted while being treated as a means does not necessarily denote that one is being wrongfully exploited since the interests of both Norv and Leslie, in this case, are not necessarily moral interests.

Even though the case of Norv and Leslie does not demonstrate that either is treating the other as a mere means to an end, it is not clear that both are treating each

¹⁵⁸ I realize that being deprived of some or maybe even all of one's basic necessities does not necessarily render one incapable of acting in accord with the moral law. However, depriving B of her basic necessities, A is inhibiting B's ability to act morally, and insofar as A inhibits B's ability to act morally A, himself, is acting immorally.

¹⁵⁹ I am trying to establish a moral minimum namely that these moral interests are necessary to establish a moral foundation for the basic rights that Shue proposes. Admittedly, there may be other morally relevant interests, but these would go beyond a justification for basic rights.

¹⁶⁰ Mutual exploitation is seemingly similar to what Alan Wertheimer calls mutually advantageous exploitation, which includes those exploitative relations where both the exploiter and the exploitee gain from the relation. It may be the case that Norv and Leslie are involved in a mutually advantageous exploitative relation instead of one involving mutual exploitation, where the latter suggests that the exploitee gains nothing from the relation. Leslie benefits from Norv's income while Norv benefits from Leslie's housework – this relationship is mutually advantageous.

¹⁶¹ Tormey clearly states this condition in EC₄, and considers "unfair" treatment to be similar to being treated selfishly. From a slightly different perspective, Wertheimer suggests that treating persons unfairly can be understood in two ways: 1) A benefits through harming B or that A's benefit far exceeds the benefit to B; 2) A's benefit depends on manipulating some characteristic of B or some aspect of B's situation.

other as an end in themselves. Each should (categorically) treat the other in ways that he/she could accept under purely rational conditions.¹⁶² Presumably, neither Norv nor Leslie could accept being treated this way under purely rational conditions and both are thereby disrespecting each other. Since neither is treating the other with the sort of moral respect that each deserves, and each is using the other as a means to his/her end (exploiting), both are *wrongfully* exploiting one another.

Let us consider a slightly different case: an employer-employee relationship. David is down on his luck and has been trying to land a decent job for quite some time. In order to support himself and his dependants, he must earn at least \$10/hr. All of the jobs that he has applied for have only offered, at most, \$7/hr. A recruiter from the local coal-mining operation tells David that they are hiring and the pay is \$10/hr. including health benefits for him and his family. It is common knowledge that the coal-mining is inherently dangerous (one might develop black-lung or be trapped in the mine due to a collapse) even though the operation attempts to provide a safe work environment for their employees. After applying for the coal-mining position, David receives a job offer but is very reluctant to accept since he fully realizes the potential harm involved in such a job. Despite having other job opportunities that present far less health risks, David accepts the job at the coal-mining operation. Is the coal-mining operation wrongfully exploiting David?

To begin with, according to Tormey, David is exploited by his new employer since his situation satisfies three of her conditions for exploitation. First, David's new employer is a person or group of persons who have developed a project (mining coal through the use of machines and human labor) planned to result in benefits for the firm (profits) (EC₁₋₂). Second, the employer gains what David loses (labor) (EC₃). So, David is being exploited, i.e. he is being used as a means to the firm's end.

However, David's situation does not necessarily fulfill Tormey's fourth condition of exploitation, which is required to demonstrate that a case of exploitation is actually immoral. The offer made to David by the coal-mining operation is reasonable since the going rate for such a position is very close to \$10/hr., which will earn him enough money and health benefits to meet his basic needs and those of his family. Although David may feel pressured by his situation to accept the mining job (since under different conditions he would have refused such risky employment) the coal-mining operation is not forcing David to work for them, nor are they (at the outset) treating him unfairly since they made him a reasonable job offer, thereby adequately considering his interests. Moreover, David may *feel* exploited because he has to risk much more than he is being compensated for (i.e. his life), but he is not actually being wrongfully exploited since his conditions of employment, albeit relatively undesirable, are reasonable, i.e. the operation is giving David's moral interests proper consideration and he could accept such treatment under purely rational conditions.

One other concern that I have with Tormey's account of exploitation is that she claims that exploitation requires an intentional act resulting in some gain for the exploiter. Let's return to the previous section where Tormey points out that some may argue that exploitation necessarily involves an intentional act to exploit on the part of the

¹⁶² Ronald M. Green, "What Does it Mean to Use Someone as 'A Means Only': Rereading Kant," *Kennedy Institute of Ethics Journal* 11, no. 3 (2001): 254.

exploiter since “exploitation requires a conscious project resulting in planned benefits or gains” for the exploiter.¹⁶³ Tormey’s main point here is that *wrongful* exploitation must be a relation between at least two people where the exploiter is a person intending *at minimum* to gain from the relation. The exploiter need not intend to exploit the other person (or group); he must only intend to gain from the relation. Recall the above example concerning Chad. Chad was construed as wrongfully exploiting Kicks’ Indonesian workers since his actions unwittingly contributed to the unfair treatment of these workers. According to Tormey’s account of exploitation, Chad is exploiting the Indonesian workers when he purchases his Air Kicks. However, does it make sense to say that Chad is actually wrongfully exploiting these workers? Granted, Chad is benefiting from his conscious project to gain from his relation with Kicks’ Indonesian workers who produce the shoes, and to this extent he satisfies Tormey’s EC₁₋₂. Chad merely intends to purchase and enjoy the shoes and is (let’s suppose) unaware of the existing wrongful exploitation of the Indonesian workers. Nevertheless, Chad has no direct control over Kicks’s treatment of its employees, and, in such a case, it seems unreasonable to contend that Chad is guilty of wrongfully exploiting these workers. Charging moral agents with exploitation in a situation that they have no direct control over is unreasonable, even if the moral agents benefit from the situation.

It could be argued that Chad, as Kicks’ consumer, has some control over Kicks through his dollar votes. But even in this case, Chad is still not in direct control over the workers’ situation. If this is correct, it seems that even though the exploiter need not intend to exploit in order to exploit, the exploiter must at least be in direct control (but not necessarily full control) of the exploitative situation in order to be held culpable.¹⁶⁴ Tormey fails to make explicitly clear the actual role one must take in the exploitative relation to be an exploiter, even if the exploiter does not intend to exploit.

Even though Tormey’s account of exploitation is lacking, her position appears to be fundamentally sound in that it successfully captures many of the necessary conditions which must be satisfied for an exploitative relation (both non-moral and immoral) to exist. By appealing to Wood and Kant to fortify Tormey’s account, a robust conception of wrongful exploitation has been created, which is capable of addressing the immorally exploitative aspects of some novel interactions in the business world. In the next section of this chapter, I will offer my revised view of exploitation, which will incorporate my fortified account Tormey’s view.

¹⁶³ Judith Tormey, “Exploitation, Oppression, and Self-Sacrifice,” *Philosophical Forum* 5 (1974): 209.

¹⁶⁴ By “direct control”, I mean having the power to influence or command the actions of individuals in a particular situation absent some intervening party having greater influence or command over the situation. The distinction being drawn between “direct control” and “full control” is that full control requires one person to have the sole power to influence or command a situation, whereas “direct control” may involve several individuals in a group (such as a board of directors) having the sole power to influence or command a situation.

Section 4.3: My Revised View of Exploitation

To be explicitly clear, the account of exploitation which I espouse is an empirical notion of exploitation. That is, I contend that not all cases of exploitation are actually immoral. If we take the term “exploitation” to merely be a permutation of the word “use,” then it is not necessarily wrong that we *use* persons as a means to our individual ends. Even Kant believed that using persons as a means to an end is not *prima facie* wrong. Using persons becomes wrong when we use them *merely* as a means to an end. Accordingly, we may exploit persons for various reasons and in various ways as long as we treat them, at the same time, as ends in themselves. So, exploitation is wrong when the exploitee is treated unfairly.

While I agree with Tormey insofar as EC₁₋₃ denote conditions for non-moral exploitation and that exploitation is wrong when the exploitee is treated unfairly, I diverge from what she may consider “unfair” treatment. My account of wrongful exploitation is very Kantian since I appeal to Kant’s moral philosophy to define the term “unfair” and thereby develop a slightly more detailed account of wrongful exploitation than Tormey’s.

To begin with, non-moral exploitation requires a relation to be formed between an exploiter and an exploitee, the former must be a person whereas the latter can be either a person or a thing.¹⁶⁵ The exploiter must be a person since persons, due to their rational capacity for making autonomous decisions, are capable of intentionally carrying out conscious projects that they set for themselves.¹⁶⁶ In order to be an exploiter, one must be in direct control (and not necessarily full control) of the exploitative relation. Even if one’s conscious project is mainly to benefit from a situation, but does not intend to treat others unfairly, one must, at minimum, have some direct control over the exploitative relation to be accurately considered an exploiter. Put more simply, A must have some direct control over the treatment of B or over B’s situation for A to properly be considered an exploiter. It seems unreasonable to think that a person can be held culpable for a situation that he has no direct control over. So, for one to be properly considered an exploiter, the exploiter must be a person and have some direct control over the exploitative relation.

The exploiter (not just anyone) must be a recipient of the benefits that flow from an exploitative relation. That is, when A exploits B, A must benefit in some way and to

¹⁶⁵ It may be argued that a corporation is not a real person (moral agent) and consequently cannot fulfill this first condition. However, we commonly condemn or praise a corporation for its conduct and this seems reasonable since a corporation is controlled by a group of individuals who are, individually, appropriate objects of moral praise or blame. As a result, we can reasonably say that a corporation is merely a group of individuals.

¹⁶⁶ I am using the term “persons” to refer to those fully functional members of our species having the capacity to reflect on one’s first order desires (such as sex, sleep, and hunger) at a second-order; and capable of acting on one’s considered preferences. Denis G. Arnold and Norman E. Bowie, “Sweatshops and Respect for Persons,” *Business Ethics Quarterly* 13, no. 2 (2003): 221-242.

some degree from his relation to B.¹⁶⁷ The exploiter must benefit from the exploitative relation since, as Tormey states above, exploitation involves a conscious project that results in planned gains (of some kind) for the exploiter. There appears to be no incentive for A to exploit B if A does not stand to benefit in some way and to some degree. Furthermore, even though the exploiter must benefit from the exploitive relation, he need not be the only recipient of the benefits nor the party that benefits the most (primary recipient). Let's reconsider the Kicks case above. Kicks employ an Indonesian contractor to produce a certain line of products. Due to the terms of the labor agreement, Kicks has no direct control over the treatment of the contractor's employees. The Indonesian contractor wrongfully exploits its employees by requiring them to work under hazardous conditions (treating them merely as tools). In this situation, Kicks is not the exploiter since it does not have *direct* control over the contractor's workers. Both Kicks and the contractor benefit from the exploitation of the workers, but the contractor's gain is less than that of Kicks'. Kicks' profits are greater than the contractor's payments, making Kicks the primary recipient of the benefits flowing from the exploitative relation. This example illustrates a case when the exploiter is not the primary recipient of the exploitative relation, but does receive some benefit in the form of payment. The main point here is that A need only be in direct control over his relation with B to be correctly construed as B's exploiter even though A is not the primary recipient of the benefits flowing from the exploitative relation between A and B.

In order for exploitation to be morally wrong, individuals must be treated unfairly. I understand "unfair" treatment to mean illegitimately capitalizing on persons' vulnerabilities, which is to benefit from treating them merely as a means to an end.¹⁶⁸ In fair game situations a competitor is celebrated if he is able to capitalize on his opponent's vulnerabilities as long as he plays by the rules of the game. In such a situation the competitors in the game consent to the risk of being left worse-off (losing the game). If A exploits B's vulnerabilities through fraudulent or deceptive means, A can be said to have inappropriately capitalized on B's vulnerabilities. In such a fraudulent situation, B has either not consented to being left worse-off or has been forced by her situation to accept being left worse-off. Reaping the benefits of a situation through fraudulent or deceptive means is equivalent to lying or cheating. Both of these are wrong from a Kantian perspective since both treat people as mere tools. Treating persons in such a way is equivalent to disregard their moral interests, which is to force them to live a life of causal necessity. If persons are compelled to live through causal necessity, they are inhibited or prevented from freeing their individual wills from sensuous inclinations. Those who are responsible (either fully or partially) for constraining persons to causal necessity are disrespecting them as moral agents capable of autonomous rational action. So, from a Kantian perspective, treating B as a *mere* means to an end is to deny or ignore B's ability to make rational decisions (i.e. to deny her dignity). So, B is treated unfairly

¹⁶⁷ Claiming that the exploiter must benefit "in some way" and "to some degree" may seem redundant, but there is a subtle difference between the two provisos. One can benefit from a situation by gaining money, respect, pleasure, etc. One can also benefit in the same ways, but to differing degrees: gaining more or less money, respect, pleasure, etc.

¹⁶⁸ To inappropriately capitalize on B's vulnerabilities is to render B worse-off. Being left worse-off involves being deprived of something that one is entitled to, which may entail having something taken away or being denied access some enjoyment.

to the extent that her dignity is ignored or discounted, and such unfair treatment evolves into a wrongfully exploitative relation when the person in direct control of the situation illegitimately capitalizes on B's vulnerabilities while treating her as a mere means.

In summary, exploitation is not always immoral. For a particular relation to be considered *wrongfully* exploitative, it must first meet the non-moral conditions of exploitation. If a situation reveals that persons are merely treated unfairly (i.e. treated as mere means), while the remainder of the situation does not meet the requirements for an exploitative relation, then it may be wrong on some other account but it would not be a case of wrongful exploitation. That is, just to violate Kant's respect for persons principle does not, in itself, make the relation wrongfully exploitative. A particular situation is *wrongfully* exploitative when it first meets all requirements of an exploitative relation and also results in A treating B (who must be a person) as a mere means to his end or A failing to respect B's dignity and thereby leaving B worse-off. So, wrongful exploitation need not only involve A treating B as a mere means to A's premeditated end, but it also involves cases when A is using B as a means to his end and fails to, at the same time, treat B as an end in herself.

At this point I have constructed a view of exploitation that is primarily based on Judith Tormey's account of exploitation as detailed in her article "Exploitation, Oppression, and Self-Sacrifice." Although my revised view is very similar to Tormey's, I have used the work of Allen Wood and Immanuel Kant to help fortify the weak points in Tormey's position. Additionally, I have offered a few of my own solutions to Tormey's weaknesses to develop a robust analysis of exploitation, which (I hope) can be used to detect not only clear cases of exploitation but also its most subtle forms. To test my analysis, I will apply my revised view of exploitation to the contemporary debate concerning the implementation of genetic use restriction technologies (GURTs), more popularly known as Terminator Technology.

Section 4.4: Exploitation and Terminator Technology

The crux of the activist groups' main argument opposing the implementation of Terminator Technology is that it will fringe upon the basic rights of resource-poor farmers allowing MACs to take unfair advantage of them by inappropriately capitalizing on their vulnerabilities. As I argued in Chapter 3, the potential implementation of Terminator Technology will not necessarily infringe upon the basic rights of resource-poor farmers. However, even if the implementation of Terminator Technology does not infringe upon the basic rights of resource-poor farmers, will the potential implementation of this technology by MACs wrongfully exploit resource-poor farmers? In an attempt to answer this question, we need to determine two things: First, will MACs be engaged in a non-moral exploitative relation with resource-poor farmers if Terminator Technology is actually implemented? Second, will MACs be taking unfair advantage of farmers through the implementation of Terminator Technology by illegitimately capitalizing on the farmers' vulnerabilities?

For MACs to be accurately construed as exploiters of resource-poor farmers (in the non-moral sense), they must be engaged in the following actions.

- The exploiter must be a person or group of persons.
- The exploiter must have some direct control over the exploitative relation.
- The exploiter must benefit in some way and to some degree from his relation to the exploitee.

Additionally, to be accurately construed as wrongfully exploiting resource-poor farmers, MACs must meet the above three requirements and, at the same time, fail to adequately respect the individual farmers' dignity.

Recall from the human rights discussion in Chapter 3 that there are actually two distinct seed supply sectors throughout most of the world: the formal seed sector and the informal seed sector. The formal sector predominantly supplies seed to commercial farmers engaged in high-intensity farming and only partially supplies medium-intensity farmers. The informal seed sector is responsible for supplying most of the seed needs of medium-intensity farmers and all of the seed needs of low-intensity farmers (both sorts of farmers are considered to be resource-poor due to their inability to afford to engage in high-intensity farming). Although these two sectors currently exchange genetic information, the formal seed sector perceives such exchanges to be leaks instead of free exchanges since most breeders in this sector seek remuneration for the use of their seeds, whereas the informal breeders are content with the free exchange of genetic information. Furthermore, only those plant varieties that are currently genetically modified will be the targets for the implementation of Terminator Technology, and only those farmers who obtain seed from the formal sector will be affected by such implementation. Given that most resource-poor farmers are currently unable to afford genetically modified varieties, and the primary targets for implementing Terminator Technology are currently modified varieties, MACs will not have the opportunity to form a relation with these farmers so as to use them as a means to maximizing profits. Consequently, we can see that the Terminator Technology debate (as presented by many activist groups) fails to satisfy an essential condition of wrongful exploitation.

However, Christian Aid contends that MACs may potentially take unfair advantage of resource-poor farmers through the use of aggressive marketing schemes that are currently being used to dupe uneducated farmers into using GM plant varieties. These aggressive tactics include free seed trials, misleading promotions, and credits. Such marketing techniques are, according to Christian Aid, essentially an attempt to wrongfully exploit uneducated farmers who are incapable of accurately discerning between unsubstantiated claims and scientific facts regarding the products being sold.¹⁶⁹ There have been no clear cases detailing practices that involve aggressive marketing schemes to dupe resource-poor farmers into purchasing suicide seeds, and without a detailed case, we cannot accurately determine if MACs are actually wrongfully exploiting resource-poor farmers in this way. As a result, the only way that MACs can accurately be said to be wrongfully exploiting resource-poor farmers by selling terminator seeds is if

¹⁶⁹ Christian Aid, "Selling Suicide: Farming, False Promises and Genetic Engineering in Developed Countries," May 1999, <http://www.christian-aid.org.uk/indepth/9905suic/suicide2.htm> (25 February 2004).

these corporations actually engage in deceptive or aggressive marketing schemes designed to entice these farmers to begin using GM varieties that contain the terminator gene. So, as long as MACs refrain from using such immoral marketing techniques, these corporations cannot be said to be wrongfully exploiting resource-poor farmers.

But what about Terminator Technology becoming so pervasive that resource-poor farmers unwillingly become exposed to “suicide seeds” through seeds leaking into the informal seed sector? That is, can MACs be accurately construed as wrongfully exploiting resource-poor farmers if these farmers unknowingly sow “suicide seeds” thereby being left with sterile seeds for planting subsequent years’ crops? Admittedly, such a situation would leave unwitting farmers worse off, but the MACs distributing the “suicide seeds” would not necessarily benefit from such a situation since these farmers would not have the economic resources available to purchase seed from these corporations in subsequent years, and would therefore not be wrongfully exploiting these farmers. Alternatively, these farmers would have to initially seek assistance from their home government or attempt to replenish their seed stores by obtaining seeds from the informal seed sector. However, it is reasonable to hold MACs responsible for controlling the safe distribution of the terminator seeds so that peripheral negative socioeconomic impacts are minimized. To guard against seeds leaking into the informal seed sector MACs distributing terminator seeds should educate their national distributors and sales personnel so as to only sell these seeds to commercial farmers. In addition to educating their own personnel, MACs may have the responsibility of establishing or helping to establish a public seed breeding initiative that would help minimize the income gap between resource-poor farmers and commercial farmers that may occur due to the implementation of Terminator Technology. So, the implementation of Terminator Technology by MACs may be construed as immoral on some grounds, but it is not wrongfully exploitative.

Chapter 5: Conclusion

At this point, I have only addressed a very limited range of concerns relative to the broader scope of socioeconomic and environmental issues that are either directly associated (or tangentially associated) with this issue. Even though such issues are all very important and require careful attention, I have limited my discussion to dealing only with those few but powerful criticisms leveled against the potential implementation of Terminator Technology by NGOs and activist groups.

In light of the barrage of criticisms that Terminator Technology has received since it was first proposed as a potential addition to GM technology, the main arguments leveled against this technology appear to be misinformed due to the inaccuracy of their empirical claims. After taking a closer look at the critics' arguments opposing Terminator Technology we can see that the potential implementation of this technology will not necessarily infringe upon the basic rights of resource-poor farmers, neither will it inevitably wrongfully exploit them in an attempt to maximize seed industry profits. As I argued in Chapter 3, farmers do not actually have a right to save GM seeds without the expressed permission of the corporations that produced the seeds. Such corporations have the right to control the use of their intellectual property. Additionally, in Chapter 4, I argued that as long as MACs avoid using deceptive marketing schemes to entice farmers into using GM plant varieties containing terminator genes, MACs cannot be accurately construed as wrongfully exploiting resource-poor farmers since these corporations will not be dealing directly with these farmers and will not have the opportunity to use them as a means to maximizing seed industry profits.

In conclusion, even though I contend that MACs will not be infringing upon resource-poor farmers' rights nor wrongfully exploiting them through the potential implementation of Terminator Technology, I do think that MACs have a minimal social responsibility to help educate farmers so that they can accurately assess the risks and benefits involved in using GM seeds, especially those containing the terminator gene. This may require that MACs participate in the investment of public seed breeding initiatives, and possibly help resource-poor farmers to understand their alternatives to farming systems that require a significant amount of purchased inputs such as organic farming. Although MACs would not be wrongfully exploiting resource-poor farmers, they would still have a moral responsibility to respect (in a Kantian manner) the farmers who are potentially negatively affected by the implementation so as to not be culpable for making resource-poor farmers lead lives of causal necessity. Most importantly, MACs have a responsibility to mitigate any and all negative effects of their actions especially the implementation of novel technologies.

So, although I believe that advances in GM technology may prove to be beneficial to both humans and non-humans alike, I strongly advocate proceeding with caution.

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Vita

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