

Corn for the Starving or Ethanol for Fuel?: An Ethical Dilemma for Members of the Automobile Culture

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Abstract

Humankind has developed a technology based on petroleum that provides personal transportation at a very low cost. Arguably, the United States is the best example of an automobile culture whose housing, shopping, and most aspects of daily life depend upon cheap, personal transportation. As a result, vast, but finite, supplies of petroleum, laid down over millions of years, have been seriously depleted over the last 100 years, and the demand for oil is increasing exponentially, while the supply is decreasing. In addition, extracting oil from many newly located oil fields is far more difficult than extraction was from early fields. Along with this oil scarcity is global climate change, which is already having a major adverse effect on food supplies; this scarcity will also probably worsen. At present, a growing industry is converting foodstuffs, such as corn, into ethanol to fuel automobiles. With approximately 800,000 people going to bed hungry each night, converting food to fuel use raises important moral and ethical questions. Most certainly, the growing global human population will further exacerbate the food versus fuel situation. Choices made to alleviate energy shortages, food shortages, conversion of foodstuffs to energy, and population growth will highlight the basic human value system and clearly distinguish between what humans profess and what humans practice.

Keywords: Global food shortage, Biofuels, Automobile culture, Peak oil, Starving humans, Economics, Ethics.

“Unless someone like you cares a whole awful lot/Nothing is going to get better. It’s not.”

—*The Lorax* by Dr. Seuss (a popular children’s book that includes many comments on the environment)

1. Overview

Myriad examples illustrate that an individual cannot do just one thing. The question of food or fuel is an ideal example because this issue is far less complicated than many others. Corn supplies are finite, and, when demand increases, the price of this staple rises and makes it too costly for the very poor, whose numbers increase by millions each year. Current practices are hurting the human species, and compassion for other species is even less, including charismatic species such as the polar bear. Greenhouse gases (e.g., produced by driving) melt the ice that is prime habitat for polar bears. This situation gives new meaning to the term “road kill” – usually applied to animals killed by moving automobiles – because polar bears are now being killed by carbon dioxide from automobile exhausts and other sources of greenhouse gases. The connections between

habitat fragmentation that occur because of roads and other human artifacts are even less apparent, but are still of enormous ecological importance.

The US Conference of Catholic Bishops (USCCB, 2007) addressed three major themes that could be used by policymakers (and, one might add, the general public) in their response to global climate change: (1) “a ‘priority for the poor’ must ensure that the needs of the poor and vulnerable around the world are not forgotten,” (2) “this issue focuses on ‘a pre-eminent example’ of how our debate and decision should reflect the pursuit of the common good, rather than the search for economic, political or other narrow advantage,” (3) humankind must act with urgency. After all, God’s creation needs protection, love, and care. How refreshing and inspiring that the USCCB places the poor and vulnerable, pursuit of the common good, and acting with urgency ahead of economic growth.

2. 2004 US Election Demographics

In the last presidential election in the United States, the midwestern states voted overwhelmingly for incumbent George Bush. They shared deeply held Christian values and a dedication to “compassionate conservatism,” although this dedication has not improved conditions for the poor or markedly reduced their numbers. Much of US grain is produced in these states; consequently, the fate of corn and other grains that are produced in these states should be decided there. Which will prevail – market values (i.e., fuel) or ethical values (i.e., food for the starving)? If market prices prevail, most of the corn will almost certainly be used for fuel, since the extremely wealthy people will be able to outbid the poor, who would use the corn for food. Should ethical/moral values override market values to ensure that people do not starve because corn is being converted to fuel? What role should the government play in this situation? What about the poor in other parts of the world who have less purchasing power than the US poor? Rationing (one suggestion) will only work if no “black market” emerges to circumvent rationing. Removing the tariff on imported ethanol might result in more corn reaching the US starving, if not the global starving.

3. Phantom Land versus Presently Arable Land

Fossil fuels (e.g., petroleum, coal), to which humankind has become addicted, took millions of years to produce and are being consumed in hundreds of years. Humans have been using ancient sunlight sequestered in Earth as fossil fuels. The land upon which the biota that became fossil fuels grew is termed *phantom land*. As fossil fuels disappear, the main source of energy will be the sun, unless the more hazardous source, nuclear energy, receives strong support. The sun can be utilized directly as an energy source (e.g., solar panels) or indirectly (e.g., wind and tide) or as a means of capturing energy in plants and converting that energy to fuel (e.g., ethanol). In the latter case, the amounts will be finite due to the finite supply of arable land.

When the demand on a resource exceeds its ability to meet all demands, some form of resource allocation becomes essential. Resource wars are a likely, but not inevitable, result. If the general population perceives the resource distribution to be unfair and inequitable, sabotage is also one probable outcome. All wars waste resources, but resource wars are especially horrendous because they focus on taking resources away from someone, instead of conserving resources and attempting to achieve a fair and equitable distribution of them. Resource wars, and the sabotage that invariably accompanies them, damage both resources and the infrastructure needed to deliver them.

4. Less Energy Per Capita

Humankind’s idol for the 20th century and the beginning of the 21st century has been cheap, abundant energy. Humans have been the recipients of the energy from past sunlight (i.e., fossil fuel) plus the energy from today’s sun. At present, fossil energy is being depleted and becoming more expensive to extract. The inconvenient truth is less energy per capita. Alternative sources of energy are neither abundant nor cheap. Instead of acting as leaders for this new era, many politicians assert that unproven technologies will enable humans to maintain their present, energy profligate lifestyles. One unproven technology, turning food (i.e., corn) into fuel (i.e., ethanol), was a centerpiece of US President Bush’s 2007 State of the Union Address. On the other end of the spectrum, the simple truth was spoken by a world leader when British Prime Minister Winston Churchill stated during the dark days of World War II: “I have nothing to offer you but blood, sweat, and tears.” The citizenry of that time rose to the occasion, as many usually do when the truth is told. Actually, the citizenry is often far ahead of the politicians; consequently, when the truth is finally spoken, the speaker is considered a leader. Furthermore, as Dennett (2006, p. 22) notes: “Life is sacred, and no amount of money would be a fair exchange for a life, and if you don’t already know that, what’s wrong with you?” [emphasis his].

Tetlock (2003) identifies values as sacred when they are so important to those who hold them that the very act of considering them is offensive. Tetlock *et al.* (2004) have carried out experiments in which subjects are obliged to consider “taboo trade-offs.” The results confirmed the model that subjects feel guilty, and sometimes even angry, about being lured into thinking about any dire choices, even when the subjects made all the right choices. The “right choice” in the consideration of fuel or food would be to assure that corn is used to feed starving people, rather than turning it into ethanol to fuel an automobile for recreational driving. With a global population still growing, the specter of peak oil, addiction to cheap oil, and no robust energy policy, a re-examination of sacred values is long overdue.

An Eco-Ethics International Union report (Osadchuk, 2007) notes that survival in the “new” interdependent world requires control of “the beast in us.” How can this control be accomplished when some political leaders fail to grasp that converting food to fuel is immoral when nearly a billion people go to bed hungry each night at present, which is the case even before a major diversion of food to fuel has occurred? The Task Force Chair for the report, Olga Osadchuk, states that the well-being of huge numbers of people, perhaps even the survival of human society, will be impossible without restrictions or prohibitions on use of scarce vital resources. Osadchuk (2007) cites Wundt, who calls “taboo” the oldest unwritten code of humanity, and Freud, who notes that

Taboos are very ancient prohibitions which at one time were forced upon a generation of primitive people from without, that is they probably were forcibly impressed upon them by an earlier generation. The prohibitions maintained themselves from generation to generation, perhaps only as the result of a tradition set up by paternal and social authority.

Clearly, new taboos are needed for the present time, and they may have to originate in a younger generation that is familiar with rapid change in order to increase the probability of having a habitable planet on which to live. As Osadchuk (2007) notes, “The most difficult problem that must be solved is how to overcome the passivity of people who, being egoistic, don’t care for anything in the world but themselves.”

5. Taboos for Our Time

Humankind is embedded in a biospheric life support system that has produced conditions (e.g., atmospheric, climatic) for 160,000 years particularly favorable to human life. However, Barry (2007) remarks, “At what point will abrupt climate change and deterioration of the Earth System’s life giving biosphere be recognized as a global ecological emergency, and responded to as such? And will it then be too late to limit damages, or even to survive?” Later in his commentary, he adds

Humanity is deeply within the Anthropocene Era, whereby our presence is the greatest force shaping the biosphere. We are witnessing the jarring collapse of the Earth’s most recent climate equilibrium, and depending upon how much climate forcing occurs from continued emissions, there are no guarantees what the next climate will look like or if it will even be regularized within a decent time period. And the longer-term results will be calamitous – extreme weather including super storms, floods and droughts, massive crop failures, vegetation die-back over whole regions, a proliferation of tropical diseases, rising seas destroying cities, a massive refugee crisis, and a general breakdown of anything resembling dependable climatic patterns.

In a very scary but persuasive article, however, Dr. Martin Rees, a cosmologist at Cambridge University and Britain’s Astronomer Royal, expects great advances from researchers around the world, but feels that their progress will be undone by what he calls the new global village idiots (Tierney, 2007). Five years ago, Rees used Long Bets, a nonprofit foundation, to wager as follows: “By 2020, bioterror or bioerror will lead to one million casualties in a single event.” When no takers came forward, Tierney (2007) placed a bet of US\$200 to stimulate debate.

6. Making the Connections

The connection between the use of corn for food or fuel seems to have been missed by most political leaders, corporate executives, and the general public. On a finite planet with finite arable land, simple arithmetic confirms that humankind simply cannot continue profligate use of energy, even if citizens are willing to allow

people to starve rather than drive less. How then can people be expected to comprehend the more difficult connections, such as the production of greenhouse gases (e.g., driving automobiles) and weird weather (e.g., floods, droughts, hurricanes)? One difficulty is that politicians and governments are sometimes perceived as distorting evidence on global heating (e.g., Buncombe, 2007). In other cases, the goal of a major political administrator may conflict with a government agency's mission. For example, the US Environmental Protection Agency wishes to tighten smog control, but US President Bush hopes to wean Americans from gasoline by using more smog-producing ethanol (Heilprin, 2007). To further complicate matters, scientists and economists have been offered US\$10,000 each by the American Enterprise Institute, a lobby group funded by Exxon Mobil, to undermine the United Nation's Intergovernmental Panel on Climate Change report released 2 February 2007 (Sample, 2007). This offer is not sound science by any standards because the offer is only good if one opposes mainstream science, rather than making an objective contribution that might or might not be congruent with mainstream science.

Another problem in making the connection is environmental illiteracy. For example, 13% of the residents of the United States have not heard of global warming, even though the United States is the world's major source of greenhouse gases (Reuters, 2007). Only 18% of US chief executives consider global warming a concern to their businesses (<http://www.signonsandiego.com/news/nation/20070129-0802-globalwarming-survey.html>). In contrast, US Congressman Roscoe Bartlett (2007) is extraordinarily well informed. He speaks and writes lucidly about the now classic talk, given by M. King Hubbard on 8 March 1956, to a group of petroleum engineers in San Antonio, Texas, USA. Hubbard predicted that, in 14 years, the United States would reach its maximum oil production and then, no matter what was done, the oil production would drop after that point, as it did. Not surprisingly, the talk was not well received in 1956; it was even ridiculed. However, Hubbard became an icon of his time. At present, the planet is at or near peak oil and is poorly prepared for the decline that will follow. Unless humankind risks the pollution from coal and/or nuclear wastes, energy per capita will be far less. As a youth, I lived in a low energy per capita society, the United States, and it was a good life – not in material possessions, but in social interactions and, for me, frequent contacts with natural systems. How in the world can anyone justify taking food from starving people to fuel automobiles?

7. Energy and Nation-States

The "father" of the nuclear submarine, US Admiral Rickover, spoke 14 May 1957, at a banquet of the Annual Scientific Assembly of the Minnesota State Medical Association in St. Paul. In his speech, he noted that high energy consumption has always been a prerequisite of political power: "Ultimately the Nation which controls the largest energy resources will become dominant." The United States is both the world's only superpower and the biggest consumer of petroleum, which, together with nuclear energy, is particularly suitable for military purposes. Although wealthy individuals may not necessarily be happier (NEF, 2006), they can purchase huge amounts of Earth's resources, including both food and fuel. For example, Raloff (2007) notes that Lester Brown of the Earth Policy Institute has been watching corn prices rise throughout the past year, driven by rising demand for corn-based ethanol as a fuel alternative to gasoline. Thus, the corn/fuel ethical/moral issue is representative of all resource issues in an era of increasing scarcity.

As Michaels (2006) demonstrates, a rapidly expanding gap between rich and poor is not lessened by programs intended to increase diversity. As he notes, diversity in higher education means the rich students come in different colors. In fact, in the United States, one unwritten taboo is not discussing the frightening disparity in individual income. Fortunately, newly elected US Senator James Webb (Virginia) covered the enormous income disparity in his response to President Bush's 2007 State of the Union Address. However, concern is justified about resource availability in the future. For example, Perkins (2007) notes that even a limited nuclear exchange could trigger a climate catastrophe, which, in turn, would adversely affect global agriculture. With luck and diplomacy, a nuclear exchange can be avoided. However, massive scientific evidence on global heating (e.g., Rosenthal and Revkin, 2007) indicates that it will be with humankind for decades, even if greenhouse gas emissions show a marked reduction. Atmospheric concentrations of carbon dioxide are at their highest level in 650,000 years (Conner, 2007). Given the long residence time of carbon dioxide in the atmosphere and the evidence that the rate of increase is beginning to accelerate, marked climate change will be a very long-term problem. Since the United States is a major greenhouse gas contributor, it is regrettable that President Bush has rejected mandatory caps on carbon dioxide emissions (Associated Press, 2007).

8. Mutualism

Although "tooth and claw" competition in nature is given much attention, mutualism (unconsciously benefiting one's neighbors) appears to be common (Holmes, 2007). If humankind continues on its present

course of reckless depletion of fossil fuels and increasing levels of greenhouse gas emissions that destabilize Earth's climate, all humans will suffer. In order for *Homo sapiens* to survive, the climate must be favorable, which requires preserving the integrity of Earth's biospheric life support system. However, the biospheric life support system has probably passed an ecological threshold at present, although the scientifically conservative Intergovernmental Panel on Climate Change (IPCC) report released 2 February 2007, states that ultimately eliminating the global warming threat would be possible with radical action. Even so, the IPCC also notes the high probability that severe weather will increase for approximately 30 years or more. Zarembko (2007) provides illustrative examples of some radical actions: (1) individuals in the United States could switch from cars to bicycles, (2) the Chinese could close all their factories, and (3) Europe could give up electricity and return to the age of the lantern. Socolow (quoted in Zarembko, 2007) states that the United States should lead the way in these radical actions. However, French President Jacques Chirac has called for action to protect the planet and forty-five nations have joined his effort, but not the United States, China, and India (Charlton and Borenstein, 2007). Without these nations, any effort is doomed to failure. Worse yet, UN Secretary-General Ban Ki-moon notes that the world's poor will suffer most from the effects of climate change (Wallis, 2007).

9. Ethics and Morality in an Era of Crisis

The ethics and morality of transforming corn into fuel is an illustrative example of the ethical issues involved in resource distribution globally. The corn/ethanol issue is driven by current events, while other issues have yet to develop as fully. The present price of corn is US\$3.23/bushel, more than half again what it was a year ago, but less than the record US\$5.545/bushel in July 1996 (Editorial, 2007). The ethanol boom has created a sharp new demand for corn, with shortages around the world (Editorial, 2007). However, the crucial message is that humankind is trying to gratify diverse appetites from the same resource, namely agricultural lands. What must be changed is not the amount of corn acreage available or even the size of the enormous harvests currently being produced, but what will need to change is the size of human appetites. Human population growth on a finite planet must also be a major factor in the decision making process. Some illustrative ethical/moral issues on resource distribution and allocation follow.

1. What resources, including appropriate habitat, should be allocated to preserve the integrity of the biospheric life support system?
2. Should allocation of scarce resources among humans be determined primarily by economic factors (i.e., free market) or should ethical/moral considerations play a major role?
3. The possibility exists that the cellulytic process that uses non-food material (e.g., stalks, vegetation) to produce ethanol would diminish the food/fuel issue. However, agricultural personnel claim that such material could be used to augment topsoil of agricultural lands. In this instance, the allocation problem is a choice between maintaining topsoil and driving.
4. Earth is a finite planet with finite resources, so exponential population growth of the human population is not sustainable. For the first time in human history, the global population has doubled in a single human lifetime. Stabilization and possible reduction in total numbers are essential now. Arguably, China has made significant steps in this direction, and many European nations have birth rates below replacement rates. However, the world population of humans is still increasing substantially. Either humans will stabilize the population within Earth's carrying capacity or nature will do so by means of famine and disease. Each year, at least 91 million humans are born in excess of those who die (Lafferty, 2007) – this number means 1 billion more people every 11 years. Currently, Earth' carrying capacity is estimated to be 4-5 billion people (Lafferty, 2007), but global climate change could easily lower this number. Humans have a choice but will have to go beyond individual desires to protect communal well being, and all choices will require "tough love."

10. Carrying Capacity

Daily and Ehrlich (1996, p. 999) conclude: "Our characterization of aspects of the complex relationships between equity and sustainability and between equity and carrying capacity (CC) leads to the following general conclusion: increasing equity at all levels of organization above conditions prevailing today would indeed enhance sustainability and CC." Daily *et al.* (1994, p. 474) assume that "until cultures and technologies change radically, the optimum number of people to exist simultaneously lies in the vicinity of 1.5 to 2 billion people." This projection is considerably lower than Lafferty's (2007), but has less optimistic assumptions. Since the number of people in 2007 is approximately 6.5 billion, it is clear that population size must be reduced and equity/fairness enhanced. The aspirations will not be easy in an era of rapid global change, but the alternative, rapid population reduction by means of famine, disease, and war, is appalling.

11. Concluding Statement

The Japanese Zen philosopher Dr. Daisetz T. Suzuki stated: "Nature is the bosom whence we came and whither we go" and, further, "Nature produces Man out of itself; Man cannot be outside of Nature" (quoted in Campbell, 1972). However, little attention is given to these wise observations in the 21st century. The damage humans do to nature also endangers humankind. Ecological ethics should guide human actions instead of being virtually ignored. The ethical relationship of humans to each other should be a major component of eco-ethics, as should humankind's relationship to other life forms. Technology will not eliminate humankind's responsibility in either of these critical issues.

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References

- Associated Press. 2007. "White House rejects mandatory CO₂ caps". 2Feb
<http://www.losangeleschronicle.com/articles/viewArticle.asp?articleID=20127>.
- Barry G. 2007. "'Wacky weather' is deadly global heating". *Truthout/Guest Contributor* 11Jan
http://www.truthout.org/docs_2006/011107H.shtml.
- Bartlett R. 2007. "Energy resources and our future". *Energy Bulletin* 27Jan
<http://www.energybulletin.net/25161.html>.
- Buncombe A. 2007. "Bush accused of distorting evidence on climate change". *The Independent* 31Jan
<http://news.independent.co.uk/world/americas/article2201092.ece>.
- Campbell J. 1972. *Myths to Live By*. Penguin Books, New York, NY, USA.
- Charlton A. and Borenstein S. 2007. "Global call to action for earth: the U.S., China and India absent as 45 countries fight man-made warming". *Denver Post* 4Feb
http://origin.denverpost.com/rodriguez/ci_5154566.
- Conner S. 2007. "Carbon dioxide rate is at highest level for 650,000 years". *The Independent* 3Feb
<http://news.independent.co.uk/environment/article2211568.ece>.
- Daily G.C. and Ehrlich P.R. 1996. "Socioeconomic equity, sustainability and Earth's carrying capacity". *Economic Applications*, 6(4), 991-1001.
- Daily G.C., Ehrlich A.H. and Ehrlich P.R. 1994. "Optimum human population size". *Population and Environment: A Journal of Interdisciplinary Studies*, 15(6), 469-475.
- Dennett D.C. 2006. *Breaking the Spell: Religion as a Natural Phenomenon*. Viking Penguin, Penguin Group, New York, NY, USA.
- Editorial. 2007. "The price of corn". *New York Times* 6Feb Late edition-final, Section A, p. 20, col. 1.
- Heilprin J. 2007. "EPA plan to tighten smog standards collides with Bush goal to cut gas use". *Associated Press*, 31Jan <http://www.enn.com/today.html?id=12133>.
- Holmes B. 2007. "When co-operation is the key to survival". *NewScientist.com* 3Feb
<http://environment.newscientist.com/article/mg19325894.200-when-cooperation-is-the-key-to-survival.html>.
- Lafferty M. 2007. "Too many people, not enough Earth". *The Columbus Dispatch* 13Feb
<http://www.dispatch.com/php?story=dispatch/2007/02/12/20070213-D6-00.html>.
- Michaels W.B. 2006. *The Trouble with Diversity: How We Learned to Love Identity and Ignore Inequality*. Metropolitan Books, Henry Holt & Co., New York, NY, USA.
- NEF. 2006. *The (Un)Happy Planet Index: An Index of Human Well-being and Environmental Impact*. New Economics Foundation, London, UK.
- Osadchuk O. 2007. "New taboos key to overcoming aggression and destruction". *Green Planet Task Force Report*, 23Jan eeiulist@int-res.com.
- Perkins S. 2007. "Sudden chill: even a limited nuclear exchange could trigger a climate catastrophe". *Science News*, 171(5), 72.
- Raloff J. 2007. "Ethanol juggernaut diverts corn from food to fuel". *Science New Online* 3Feb 171(5),
<http://www.sciencenews.org/articles/20070203/food.asp>.
- Reuters. 2007. "13% of Americans not heard of global warming, report says". 29Jan
http://today.reuters.co.uk/news/articlenews.aspx?storyid=2007-01-30T072036Z_01_HO025941_RTRUKOT_0_TEXT0.xml.
- Rosenthal E. and Revkin A.C. 2007. "Science panel calls global warming 'unequivocal'". *New York Times* 3Feb Late edition-final, Section A, p. 1, col. 5.

- Sample I. 2007. "Scientists offered cash to dispute climate study". *Guardian* 2Feb
<http://environment.guardian.co.uk/climatechange/story/0,,2004397,00.html>.
- Tetlock P. 2003. "Thinking the unthinkable: sacred value and taboo cognitions". *Trends in Cognitive Science* 7, 320-324.
- Tetlock P., McGraw A.P. and Kristel O. 2004. "Proscribed forms of social recognition: taboo trade-offs, forbidden base rates, and heretical counterfactuals". Pages 142-161 in N. Haslam, ed. *Rational Models Theory: A Contemporary Overview*. Erlbaum Publishers, Mahwah, NJ, USA.
- Tierney J. 2007. "Can humanity survive? Want to bet on it?" *New York Times* 30Jan
<http://www.nytimes.com/2007/01/30/science/30tier.html?ex=1327813200en=870294ecdd260e36ei=5088partner=rssnytemc=rss>.
- United States Conference of Catholic Bishops. 2007. "U.S. Bishops call for moral focus on global climate change: new report demands urgent attention". Office of Media Relations, Washington, DC, USA, 7Feb
<http://www.usccb.org/comm/archives/2007/07-029.shtml>.
- Wallis D. 2007. "Climate change to hit poor worst, says UN's ban". *Reuters* 5Feb
<http://today.reuters.com/News/CrisesArticle.aspx?storyId=L05558458>.
- Zarembo A. 2007. "Game over on global warming?" *Los Angeles Times* 5Feb
<http://www.latimes.com/news/science/la-sci-emissions5feb05,1,3200012.story>.