

Eco-ethics and the Biosphere

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Abstract

Sustainable use of the planet is an attractive goal, especially concerning intergenerational ethics. However, a major ecological tipping point has been passed (e.g., melting glaciers) and, in the last three years, evidence has been growing that six interactive global crises are worsening: (1) climate change, (2) overpopulation, (3) loss of biodiversity, (4) ecological overshoot, (5) excessive use of fossil fuels, and (6) inadequate food and water. Earth's biosphere is being increasingly damaged, and all of its component species, including humans, are threatened with extinction. Eco-ethics and sustainability ethics are key elements in reducing risks in this hazardous situation. Biospheres will continue on Earth as long as life persists, but humans evolved and flourished in the present biosphere and should nurture it. The present biosphere was shaped by and operates within nature's laws, which include evolution, carrying capacity, limits to growth, nutrient and energy cycling, and so on. Humankind's ethical relationship with the biosphere must acknowledge that humankind is dependent upon natural capital and ecosystem services – impairing or destroying them is suicidal.

Keywords: Eco-ethics, Biosphere, Tipping points, Climate change, Overpopulation, Loss of biodiversity, Ecological overshoot.

The average human capacity for foresight has lagged behind our collective power to change the world.

—William R. Catton

A basic trio of disturbing trends – humans having become so numerous, so ravenous, and so short-sighted – has made the nature of today's human prospect far more dire than most policymakers dare acknowledge.

—William R. Catton

For all our conceits about being the center of the universe, we live in a routine planet of a humdrum star stuck away in an obscure corner . . . on an unexceptional galaxy which is one of about 100 billion galaxies . . . That is the fundamental fact of the universe we inhabit, and it is very good for us to understand that.

—Carl Sagan

1. Intergenerational Ethics

One of the most daunting aspects of climate change denial is the effects of irreversible changes upon posterity (Cairns, 2009). Irreversible climate change (Solomon *et al.*, 2009) will affect many generations of humans, assuming *Homo sapiens* is not driven to extinction by the changes. Economic discounting of the future does not appear appropriate in this situation. Ethics, morality, and compassion do seem appropriate if they lead to remedial action, such as marked reduction of risk by avoiding irreversible changes. Humankind has the power to lessen this risk markedly by reducing and then eliminating the use of fossil fuels. Surely, compassion and ethical responsibility should mandate this action to protect future generations.

2. Inter-personal Ethics

Actions to reduce unsustainable living would markedly increase the chances of leaving a habitable planet for posterity and would also reduce risks to people living on low-lying islands and estuaries (Cairns, 2003, 2004). Humankind must learn to value people who are distant in time and space. In this age of rapid information transfer, “ignorance” of the plight of others is deliberate and unethical. People who state that they are “looking out for number 1” are deliberately ignoring the fact that no individual in this era of economic globalization and complex society can really be independent. “It is often far from obvious how dependent we are, nor do we easily recognize the vastness of the range of consequences flowing from our interdependence. It is more than just the fact that there can be strength in numbers; there are advantages to diversity” (Catton, 2009, p. 76).

3. *Homo colossus*

Technological progress has transformed *Homo sapiens* “into the technology-abetted species with a colossal appetite for resources and a colossal impact upon the planet that supports us . . . Now that we have become *Homo colossus*, our own critical habitat (planet Earth) is in the process of being rendered less fit for supporting continuation of our colossal ways of life – and that transformation is of our own doing!” (Catton, 2009, p. 97).

“If *Homo sapiens* is the communicating animal, we have an endemic requirement for communication – we need to rely on information communicated from other people. . . . When others’ words too often flow from ulterior motives, they spread the fatal disease of ‘ulteriorism.’ It is a social disease, or rather an antisocial syndrome, insidiously destructive of human trust, sympathy, and cooperation” (Catton, 2009, p. 100).

One consequence of the destruction of human trust was an international attempt to discredit climate change science using “hacked” e-mails involving a few scientists in the UK, East Anglia University’s Climate Research Unit (Specter, 2009). The e-mail exchanges “prompted claims that [climate change] data had been manipulated”

(BBCNews, 2009a). Consequently, the climate skeptics called for US “Congressional hearings and investigations to look into the e-mails and whether they raise questions about the integrity of climate science. . . Rep. John Sullivan of Oklahoma said he saw a ‘culture of corruption in science right now’” (Berger, 2009). This attempt to discredit all science on the basis of unproven charges against a few scientists prompted an open letter to the US Congress from 18 leading US scientific organizations:

Observations throughout the world make it clear that climate change is occurring, and rigorous scientific research demonstrates that the greenhouse gases emitted by human activities are the primary driver. These conclusions are based on multiple independent lines of evidence, and contrary assertions are inconsistent with an objective assessment of the vast body of peer-reviewed science . . . If we are to avoid the most severe impacts of climate change, emissions of greenhouse gases must be dramatically reduced (American Association for the Advancement of Science, 2009).

4. Nature Sets the Limits

Short-term (years to decades) humans negotiate limits for anthropogenic greenhouse gas emissions. Long-term (decades to centuries) Mother Nature (i.e., natural law) “sets” the limits. If more carbon dioxide enters the atmosphere than the biosphere can assimilate, more heat is trapped and the temperature rises. The rise will not be even throughout the planet, so the increase could be 12°C in some areas and 1-2°C in others. For some species (e.g., tropical diseases), even small temperature increases may expand their range. Other species may be pushed above their tolerance limits, which could happen to any species, including *Homo sapiens*. The effects (e.g., droughts, sea level rise) of greenhouse gas emissions may be quite distant from the sources (e.g., coal-fired power plants). Ideally, ethics should not be strongly influenced by distance in time or space – but they are. Maldives islanders may soon find their homeland uninhabitable as a consequence of anthropogenic greenhouse gas emissions produced thousands of miles away but which cause sea level rise.

5. Humankind can not Negotiate with Mother Nature

At present, climate change is being treated primarily as just another political problem here compromise is essential. However, compromise is not possible when the natural laws of physics, chemistry, and biology are concerned. In a very real sense, nature is the adversary.” Unlike political adversaries, natural law will not change over time, lose power, or acknowledge defeat. Many species have gone extinct because they could not adapt to changed conditions – the time and conditions for extinction are not negotiable. Natural law will almost certainly destroy some life on Earth. What is at stake, however, is civilization and the survival of *Homo sapiens* – a much dreaded outcome because some politicians and a substantial portion of the general public neither understand nor trust the process of science.

Science is robust and the consequences of rapid climate change are already visible (e.g., melting glaciers, reduced agricultural productivity, water shortages and floods, increased rate of desertification, decreased biodiversity). Ehrlich (2009) recommends: “We don’t need more scientific assessments to tell us how fast our life-support systems are going down the drain. What we do need is something never done before – to mobilize scientists, social scientists, scholars in the humanities, and the general public to find and promote ways to change human behavior.” However, Catton (2009, p. 1) notes: “Tragically, insofar as people continue interpreting events according to an obsolete worldview, change will be too often ill-conceived and troubles will be seriously misunderstood – and thus worsened. Obsolete assumptions that developed in past centuries under circumstances now fundamentally changed remain too prevalent.” As usual, time required for significant social change is too long and, thus, too slow.

6. Can the Biosphere Wait?

Black (2009) reports that the texts drafted at the Copenhagen Climate Summit “. . . are a long way short of constituting a final outcome document, as they leave open some of the most difficult points of the negotiations so far, including the legal form of any new agreement. . . . Developed countries would prefer an entirely new agreement.” The BBC (2009b) published a study of the public opinion poll on “How serious a threat is global warming to you and your family”: (1) very/somewhat serious (V) or (2) not very/not at all serious (NV).

Country	(1) very/somewhat serious	(2) not very/not at all serious
China	33%	62%
United States	64%	36%
European Union	62%	32%
India	81%	13%
Japan	75%	25%
African Union	87%	12%
Gulf States	82%	16%
Small Islands	91%	8%

Naturally, the small islands feel global warming is more serious than the rest of the world – and with good reason (sea level rise). The rest of the world should have an ethical/moral/compassionate resolve to help them.

7. Finally the Biosphere

Catton (2009, p. 132) remarks: “For any kind of use of any particular environment there is a rate or amount of use that can be exceeded only by reducing the subsequent suitability of that environment for that use.” Evidence abounds that humankind has overused and overstressed the biosphere. Still, representatives of humankind endlessly negotiate without producing any substantial remedial action. If major reductions in anthropogenic greenhouse gas emissions are not made now, a major biospheric tipping point will probably be reached. When that change does occur, it

will be irreversible. Evolution will eventually (e.g., thousands to millions of years) produce another, different biosphere as it has after the previous five, great, biotic extinctions. Humankind has lived in a fairly predictable environment for about 160,000 years (i.e., discoverable regularities). The transition period between biospheres will almost certainly be far less predictable. The length of the transition period will depend upon how rapidly replacement species, for those driven to extinction, evolve and how long it takes for the biosphere to reach dynamic stability.

8. Conclusions

Avoiding irreversible climate change will require a strong commitment to eco-ethics based on both humanitarian and ecologically sound scientific evidence, plus action based on sustainable practices. All life is uncertain, so uncertainty should not be used to delay action when the consequences of inaction are probably catastrophic. Human economics is a subset of the biosphere and should never involve damage to it. The scientific process corrects mistakes by invalidating evidence that is not reproducible and unsound. Judgment should always be based on a preponderance of evidence published in peer reviewed journals. Political attacks on individuals that are not based on scientific evidence (the scientific process has been circumvented) discourage creative research. These attacks are unethical and are a disservice to both society and science.

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