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Eliminating Ecological Overshoot

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Abstract : Ecological overshoot is the result of using Earth's resources faster than they can be regenerated (Wackernagel *et al*., 2002). In 2007, humankind is using about 30% more resources in one year than nature can regenerate in that same year (Global Footprint Network, 2007). Ecological overshoot began in 1987, and humankind goes into ecological overshoot for a particular year on what has since been called "ecological debt day" - the day on which the total ecological footprint (measured in global hectares) is equal to the biocapacity (also measured in global hectares) that nature can regenerate in that year. For the remainder of the year, the ecological debt continues to rise from the depletion of the natural capital and allowing wastes to accumulate (Global Footprint Network, 2007). In 2007, humans demanded the biosphere's entire capacity for the year in just 279 days (on October 6). This shocking situation is made worse because very few people are even aware of it.

Key words : Ecological overshoot, Resource consumption, Happiness/life satisfaction, Consumerism, Economic growth, Population stabilization.

If we don't fight hard for the things we stand for, at some point we have to recognize that we don't really stand for them. **Paul Wellstone**

When you're in a hole, stop digging.

Denis Healey

The "Want More" Species

As a species, humans are prolific, greedy, and without empathy for other life forms (e.g., the biosphere). McKibben (2007, p. 34) notes that environmentalist Alan Durning found that, in 1991, the average American family owned twice as many cars, drove 2.5 times as far, used 21 times as much plastic, and traveled 25 times farther by air than did the average American family in 1951. Gross domestic product has tripled since 1950. McKibben (2007, p. 34) remarks: "We are, to use the very literal vernacular, living three times as large. Our homes are bigger: the size of new houses has doubled since 1970, even as the average number of people in them has shrunk." McKibben also notes that, despite all the extra space, these houses are stuffed to the rafters with belongings, enough so that an entire new industry - the storage locker - has sprung up and even reached an enormous size itself. The evidence on ecological overshoot clearly establishes that this situation cannot continue for long.

Are We Happy Yet?

McKibben (2007, p. 35) discusses whether all these material possessions have made Americans happier. In 1946, the United States was the happiest country among four advanced economies; 30 years later, it was eight among eleven advanced countries; 40 years later, it ranked ten among twenty-five nations, many of them from the third world. This background reaffirms the New Economics Foundation report (Marks *et al*., 2006) in which a third

world country, Vanuatu, was ranked first in happiness and the United States 150th out of 187 nations. If more material possessions have not brought happiness comparable to that of cultures with less stuff, why are Americans buying things that lead to ecological overshoot and endanger humankind's future? McKibben (2007, p. 37) answers this question:

> If satiation isn't what has cast a pall over our satisfaction, then perhaps the pall is the *effect* of all that economic buildup: if growth has filled the field behind your house with megamansions and you can't see the horizon anymore, maybe that loss cancels out the effect of the flat-screen TV. Or maybe the pall is cast by the fact that more of us have had to work more hours to afford all that new stuff.

Those nearing the end of their lives are already suffering from ecological overshoot, even if they have never heard of it. This situation seems fair for those alive in 1987 or later when overshoot was in progress. However, what of future generations, yet unborn, who will suffer grievously if overshoot continues? A 30% overshoot is very dangerous, both because it is unsustainable and because it is destroying Earth's biospheric life support system. Humankind is in a "hole" of it own making and still digging vigorously. Why?

Kingsolver (2003, p. 26) states:

> We must surely appear to the world as exactly what we are: a nation that organizes its economy around consuming twice as much oil as it produces, and around the profligate wastefulness of the wars and campaigns required to defend such consumption. . . We are disinclined as a nation to assign any moral value at all to our habits of consumption.

Worse yet, a significant part of the rest of the world wants to be just like Americans.

The present situation is understandable, if not justified. Most television channels spend 30% of each hour advertising consumer products. In some cases, the entire hour is devoted to advertising. Even though some viewers watch television channels that have no advertisements, most watchers are paying about 30% of their monthly cable fees to watch advertisements, which promote consumerism. However, as the Costa Ricans state: "If you want the blue sky, the price is high" (as quoted by Kingsolver 2003, p. 57).

Climbing Out of the Overshoot Hole

Eliminating ecological overshoot requires changes at every level of societal organization. For American citizens, reducing profligate energy use is the best place to start. Decades ago, I markedly reduced professional plane travel, which was mostly to give seminars on the environment. This change actually improved the quality of my life because I could spend more time with family and students. Until 1968, I could walk to my job at the University of Kansas; then I moved to Blacksburg, Virginia, and had to drive about 3.5 miles to the campus. Then my wife Jeannie suffered first from Alzheimer's and then Parkinson's, so travel was mostly for medical reasons. In 2000, Jeannie and I moved to a retirement village where we lived in a townhouse for 1.5 years. When Jeannie

went to an onsite nursing facility, I could walk to visit her. Then, in fall 2002, I moved to an assisted living home (meals provided) near the nursing home. In 2006, I drove less than 800 miles, and this number should be less than 600 miles in 2007. My car is over 11 years old and has 34,000 miles on it - most accumulated in the first three years. I control the temperature in my small apartment with a heat pump, so energy use is minimal. I have an 800-square-foot (74.3 meters) apartment, of which 30% is devoted to professional activities (it contains my computer, books, and journals). The assisted living facility has a communal dining room - serviceable, but not plush. I include all this information because I do not want to criticize others if I am not making an effort to reduce my own contribution to ecological overshoot. I have no choice over where the food comes from at the dining room, but I always comment favorably on food of local origin.

Compared to at least half of the global human population, I live in comparative luxury. Compared to the local population's consumption of resources per capita, I am almost certainly in the lower 25%. However, with 1.5 million new people being added to the global population weekly, everyone must use less while the population is being stabilized if ecological overshoot is to be eliminated. Efforts will be futile unless the human population is first stabilized and then reduced to whatever carrying capacity the climate change permits. The prospect of greenhouse gas emissions rising by 57% by 2030 compared to current levels would lead to a rise is Earth's surface temperature of at least 3°C (5.4°F) according to the International Energy Agency (Agence France-Presse, 2007).

Kingsolver (2003, p. 202) quotes Bill Moyers questioning Robert Penn Warren (then America's poet laureate): "Sir, as one of our leading writers and philosophers, can you tell me how we can resolve the terrible crises that surround us: decaying cities, terrible health care, terrible crises in education and housing, and so much poverty?" Warren leaned forward and said: "Well Bill, for a beginning, I think it would be good if we would stop lying to each other." This statement gets to the heart of the ecological overshoot issue! How can the United States, with less than 5% of the global population, use nearly 30% of the planet's resources?

Overshoot Limits

The metaphor of a bank account is good, up to a point, for explaining ecological overshoot to laypersons. Until 1987, humankind was living on interest alone (ecological services), but then began dipping into the capital (i.e., natural capital resources) at about 1% per year. With an exponentially growing population and increasing expectations, the percentage of capital used annually will increase. Climate change may well reduce the amount of both natural capital and ecosystem services. The problem with the bank metaphor is that a bank should not collapse if one account is mismanaged, but the biospheric life support system (i.e., natural capital + ecosystem services) will collapse at some, as yet unknown, threshold. The question concerns how much longer the life support system can last before it collapses - probably not more than 30 years, and possibly as little as 10. Clearly, if anything can be done to reverse the overshoot trend, it must be done in the

21st century - probably in the first quarter of the century.

The biospheric life support system is composed of Earth's species and the habitat they occupy. Some estimates predict that only 1.9 million species have been described, out of an estimated 5 to 30 million species that exist (The World Conservation Union [IUCN] and Species Survival Commission [SSC] undated). The IUCN and SSC state: "The rapid loss of species that we are witnessing today is estimated by some experts to be between 100 and 1,000 times higher than the 'background' or expected natural extinction rate." This range of rates will almost certainly reduce resource regeneration and, thus, increase overshoot and reduce carrying capacity.

Secure Borders/Stable Population

Three conditions are essential to avoid ecological overshoot.

(1) Borders must be secured for nations or territories so that no one can enter without permission. This condition is a sine qua non of keeping the human population within the resource base.

(2) A dynamically "stable" human population that tracks the carrying capacity of the resource base must be achieved. This population is probably not going to be constant, especially in an era of rapid climate change.

(3) An effective means of controlling the population's reproductive rates must be achieved so that they do not exceed carrying capacity. A prudent society will stay far enough below the carrying capacity so that a safety factor is in place in case resource regeneration diminishes.

The basic issue is how finite resources are allocated on a finite planet. Hardin (as referenced by Straub, 1997) remarks that all agriculturalists have agreed on the approach of investing in winners (e.g., good livestock) and having the remainder for supper. Also, with a limited number of acres for growing and a limited time to gather grain, an agriculturalist is irrational to grow poor grain. This practice has been used for thousands of years.

In addition, Hardin (as referenced by Straub, 1997) notes that society can no longer rely on predators or diseases to remove humans in excess of the carrying capacity. Society cannot make an ethical decision until it realizes that numeracy is a part of ethics. The default position is that natural law will reduce overpopulation by means of death, disease, and starvation. Are these alternatives preferable to conservation of resources and population stabilization?

The Pathology of Exponential Economic Growth

Economist Milton Friedman has stated: "Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around" (as quoted by Klein, 2007). However, the ideas that seem to be "lying around" are technological and economic, not ecological, even though the problem is ecological overshoot. Klein (2007, p. 48) remarks:

> Like most people I saw the divide between Baghdad's Green and Red zones as a simple by-product of the war: This is what happens when the richest country in the world sets up camp in one of the

> poorest. But now, after years spent visiting other disaster zones, from post-tsunami Sri Lanka to post-Katrina New Orleans, I've come to think of these Green Zone/Red Zone worlds as something else: fast-forward versions of what "free market" forces are doing to our societies even in the absence of war.

She notes (Klein 2007, p. 49) that "After each new disaster, it's tempting to imagine that the loss of life and productivity will finally serve as a wake-up call, provoking the political class to launch some kind of "new New Deal." In fact, in the United States, no "wake-up" call has occurred that resulted in remedial action by the political class on the three major problems of the era - (1) global heating and other types of climate change, (2) peak oil and other components of the fossil fuel crisis, and (3) overpopulation. The first two have produced heated debate, but no meaningful action. Number (3) has produced a profound and deliberate silence.

In his letter commenting on Freeman Dyson's article "Our Biotech Future" (*The New York Review*, 19 July 2007), Wendell Berry (2007) remarks:

> Mr. Dyson sees high technology as "marching from triumph to triumph with the advent of personal computers and GPS receivers and digital cameras," and he foretells the coming of "domesticated" biotechnology that will become the plaything and art form of "housewives and children," that "will give us an explosion of diversity of new living creatures, rather than the monoculture crops that the big corporations prefer," and will solve "the problem of rural poverty."

Something or Someone Will Save Us

Economic growth (e.g., rising tide will float all boats) and technology are the most common examples of "something will save us," and they are not mutually exclusive. However, former US Secretary of Labor Robert Reich believes that "supercapitalism is overwhelming government with lobbyists and money, while citizens are dazzled by the promise of previously unimaginable riches and consumer choices" (interview with Reich, reported by McNally, 2007). The result, ecological overshoot, is not substantively discussed even in democracies where one would expect such discussion to occur. Reich believes that it is a distraction from politics to push companies to be socially responsible when it runs counter to their "bottom line" (i.e., consumer deals and investor returns). Reich feels that humans recognize the cognitive dissonance between the part of their minds that is a consumer and an investor and the part that may be a citizen. However, if the latter part were not losing, ecological overshoot would not be the problem it now is.

The Power of Distraction

On October 22, 2007, world-class climate scientist James Hansen testified before the utilities board in the state of Iowa on climate warming and coal-fired electric generating plants (Roberts, 2007). Although Hansen provided 59 pages of testimony, a single sentence resulted in a major attack: "If we cannot stop the building of more coal-

fired power plants, those coal trains will be death trains - no less gruesome than if they were boxcars headed to crematoria, loaded with uncountable irreplaceable species" (Roberts, 2007). Hansen was scolded by Kraig Naasz, president of the National Mining Association, and Kenneth Jacobson of the Anti-Defamation League for the analogy he chose. Is the question of the appropriateness of the analogy really so important? Hansen was merely trying to emphasize that "climate warming was having a deleterious effect upon many of the species that collectively comprise Earth's biospheric life support system and that coal produces about twice the amount of carbon dioxide per unit of energy than petroleum does." The four recent reports of the Intergovernmental Panel on Climate Change provide robust evidence on these points. However, this "righteous indignation" is not about the important points, but about the analogy that served to divert attention from the science to the analogy. The opposition to Hansen's testimony used the one sentence to divert attention from 59 pages of testimony - and the news media loved it.

Conclusions

The steps needed to eliminate ecological overshoot are easily stated.

(1) Do not use more resources than natural systems can regenerate.

(2) Stabilize the human population within Earth's carrying capacity locally, regionally, and globally.

(3) Develop an economic system based upon maintaining the health and integrity of the biospheric life support system.

(4) Do not manufacture any product that will not benefit natural systems when reintroduced into them.

(5) Do not displace natural systems with human artifacts (e.g., shopping malls, roads) to the extent that they are fragmented and lose their interconnectedness .

Will humankind abandon rampant consumerism to protect the biospheric life support system and develop a quality life not based on material possessions? The answer is far from clear, but when a respected scientist like James Lovelock concludes that the human race is doomed (Goodell, 2007), humankind should give consideration to steps that might invalidate Lovelock's prediction.

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