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Has Human Society Passed a Tipping Point for Effective Reduction of Greenhouse Gas Emissions?

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Abstract : Recent publications have indicated that a 2°C increase of global average temperature, once thought acceptable, may involve serious risks (Greg, 2004). A global mean temperature increase of 4°C would be hotter than any time in the last 30 million years, and this increase could be realized as early as 2060–2070 (Leahy, 2009). The prospects of plans for major, immediate reduction of anthropogenic greenhouse gas emissions at the climate conference at Copenhagen in December 2009 do not seem likely. A climate bill in the US Congress probably will be weakened by numerous amendments, and China and India are not eager to implement major reductions in greenhouse gas emissions. Even if the Copenhagen Conference recommends major reductions, they are likely to be fiercely resisted because of present economic conditions. Neither politicians nor citizens seem prepared to make the "sacrifices" needed for rapid reductions of greenhouse gas emissions.

Key words : Rapid climate change, Reduced agricultural productivity, Inadequate freshwater, Societal tipping points, Climate tipping points, Climate conferences.

Political reality must be grounded in physical reality or it's completely useless.

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Two degrees C is already gone as a target.

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The climate negotiators heading to Copenhagen in December must accept the fact that the world's carbon emissions must eventually stop – and stop completely. There is no sustainable per capita carbon emission level because it is the total amount of carbon emitted that counts.

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"The G-8, eight Northern Hemisphere industrialized countries, last month [July 2009] produced its first firm target for curbing rising global temperatures: no more than 2 degrees Celsius . . . above pre-industrial levels" (Wihbey, 2009). However, research scientists now forecast a rise of about 4°C (Eilperin, 2009). ". . . global carbon emissions are still rising. It's still accelerating . . . We're not going in the right direction" (Robert Corell as quoted in Eilperin, 2009).

Assimilative Capacity

In nature, energy and nutrients keep moving because the output (wastes) of some species is input (resources) for other species. Humans take resources and turn them into things that nature cannot assimilate (e.g., shopping malls). In the case of carbon dioxide, humankind is taking supplies of sequestered carbon (coal, petroleum, and natural gas) and burning them to produce energy. The waste, carbon dioxide, can be a useful input into natural systems, but not in the quantities natural systems cannot assimilate. As a consequence, carbon dioxide accumulates in the atmosphere where it causes global heating and other types of climate change. If "business as usual" continues, civilization will be at ever increasing risk. The technological devices that sequester carbon dioxide are designed for storage and do not reincorporate it into natural systems. Humankind must design systems that are compatible with the biosphere; otherwise, humans will be apart from the biosphere and not a part of it. "Previously we haven't looked at the impact of burning fossil fuels so intensely" (Richard Betts as quoted by Shukman, 2009). If this impact is not considered, humans will be placing civilization at enormous risk. The nature geoscience team found that, over the past 50 years, the average fraction of global CO_2 emissions that remain in the atmosphere each year has likely increased from 40% to 45%, suggesting a decrease in the efficiency of natural sinks, such as the oceans and terrestrial ecosystems (EcoEarth. infonewsarchivesnov182009, www.ecoearth.info/).

The Ostrich Delusion

". . . Pliny the Elder said that the stupid ostrich thrusts its head and neck in a bush [more recently in the sand], imaging that the whole of the body is concealed" (Hardin, 1998,. Hardin (1998) called the myopia humankind has toward the increasing population "The Ostrich Factor," which is a form of Freudian denial. "When a whole culture responds in this way, it is said to be in the grip of a *taboo*, to use a term brought from the South Seas by Captain James Cook in 1777. . . . Adults who indulge in ostrichism can be said to be observing a taboo, which closes off the search for causes" (Hardin, 1998).

Humankind's dangerous delusion is that it is possible to have perpetual economic and population growth on a finite planet. If the global population were 1 billion instead of nearly 7 billion, humans could probably lead a quality life with relatively modest changes in lifestyle. At 2 billion, the population could probably be supported at a subsistence level. These estimates assume that runaway climate change will not occur, that the climate change will not cause major reductions in agricultural productivity, and that nuclear war and pandemic disease will not occur. The ecological overshoot could be eliminated by a much smaller population size, but no long-range benefits should be expected if population is not kept at or below Earth's carrying capacity and overconsumption is not avoided.

The Default Position

If remedial measures are not implemented immediately and with determination (no concessions to special interest groups), the default position is inevitable – Mother Nature (natural law) takes over. Violation of natural laws (e.g., carrying capacity) results in starvation, disease, and death to reduce the population size to fit carrying capacity. An alternative outcome is extinction, which has been the fate of many millions of species.

Destabilizing Civilization

Antelava (2009) reports some disturbing information: "For the past two years Iraq, Syria, Jordan and parts of Turkey and Lebanon, have suffered the devastating effects of the worst drought the Middle East has experienced in decades." The Middle East was unstable before the drought, but this could lead to anarchy or resource wars. We should not forget that this situation is a threat to global security. Other parts of the world are suffering serious droughts and other deleterious effects of climate change. The situation was not improved by the global financial meltdown. If civilization is destabilized, the default position (*i.e.*, Mother Nature) will reduce population to equilibrium with a disregard for individual "rights" or lives. In terms of biospheric survival, quality (*i.e.*, individual fitness) is more important than quantity.

The Per Capita Principle

A recent report by the German Advisory Council on Global Change (WBGU, 2009) is based on ". . . a fundamental political assumption . . . that the right to emit greenhouse gases is shared equally by all people on earth" (i.e., the per capita principle). This assumption favors China, India, and other densely populated countries and not comparatively low density nations such as the United States. This concept is likely to be a contentious issue at the December Climate Conference in Copenhagen. No ethical, moral, or scientific justification exists for not using the per capita principle for allocating greenhouse gas emissions. However, in the case of a pandemic disease, survival of the fittest still applies. In some contexts, evolutionary principles are the deciding factor; in others, ethics will be operative and survival of the fittest, if any, will be the major determinant for survival. Water and food shortages and crowded refugee camps are ideal breeding grounds for a pandemic disease.

Failure of the "Business-as-Usual" Mentality

> *The world economy is on the way towards CO_2 insolvency. For approximately two thirds of all countries a 'business-as-usual' policy is no longer an option. In order to avoid dangerous climatic changes it is absolutely essential to set all countries a course for transformation to a low-carbon economy immediately. This also includes the newly industrialising and developing countries. The whole world must pull together in a concerted effort to overcome the climate crisis* (Messner, 2009 as quoted in WBGU, 2009).

Atmospheric greenhouse gases must be reduced to a level that will markedly decrease climate change risk – that may be 350 ppm carbon dioxide equivalents. After reaching that concentration, anthropogenic greenhouse gas emissions must not exceed the biosphere's assimilative capacity for them. The alternative is to use inadequately tested "Hail Mary" technologies to regulate Earth's climate. These technologies may have side effects that exacerbate the climate change problem rather than cure it.

An Impossible Dream?

The Intergovernmental Panel on Climate Change (IPCC) states "that by 2020 rich industrial countries must cut emissions 25 to 40 percent (compared with 1990) if the world is to have a fair chance of avoiding catastrophic climate change" (Hertsgaard, 2009). The IPCC reports are written primarily by scientists, but political representatives of the involved countries have an impact that may account for the conservative stance of the Executive Summaries of the IPCC reports.

". . . the WBGU says that the United States must cut emissions 100 percent by 2020, . . . Germany and other industrial nations must do the same by 2025 to 2030. China only has until 2035, and the world as a whole must be carbon free by 2050" (Hertsgaard, 2009). Based on the climate bill debate in the US Congress, the reception to cutting greenhouse gas emissions 100% by 2020 will not receive much of reception. The reaction to slightly longer time frames for other countries will probably be somewhat muted but basically similar – no country will accept either the reductions or deadlines.

If the WBGU report is scientifically sound, where does that leave humans? The precautionary principle states that, if the consequences of no action would be catastrophic, action is justified even if the science is uncertain. Economists feel that reducing greenhouse gas emissions could cost $100 billion by 2020. This amount is a small sum for saving civilization, especially when trillions of dollars were lost just in the United States during the global financial meltdown. The biospheric life support system was badly damaged by rapid economic growth, but some economists would call the damage an externality and do not feel responsible for the damage. However, the biospheric life support system is essential to the survival of civilization. The situation is unthinkable, but, if an unthinkable thought remains unthinkable, the damage continues.

Conclusions

In many areas of the world (e.g., Middle East), life support systems are failing. Yet many industrialized societies seem to be either unaware or disassociated from the problem. Clearly, global problems can only be solved by all of the nations on the planet, and little time is left to make the necessary changes. Although the scale is different, this situation is not unlike a writing attributed to Pastor Martin Niemoller:

When the Nazis came for the Communists,
I remained silent;
I was not a communist.

When they locked up the social democrats,
I remained silent;
I was not a social democrat.

When they came for the Jews,
I remained silent;
I was not a Jew.

When they came for me,
There was no one left to speak out.

When humankind finally grasps the enormity of the multiple, interactive crises it faces, time may be too short to act.

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