



CHAPTER 21


CARRYING CAPACITY FOR HUMANS IN A FINANCIALLY GLOBALIZED WORLD







“FOR PURPOSES OF GAME AND RANGE MANAGEMENT, CARRYING CAPACITY IS USUALLY DEFINED AS THE MAXIMUM POPULATION OF A GIVEN SPECIES THAT CAN BE SUPPORTED INDEFINITELY IN A DEFINED HABITAT WITHOUT PERMANENTLY IMPAIRING THE PRODUCTIVITY OF THAT HABITAT. HOWEVER, BECAUSE OF OUR SEEMING ABILITY TO INCREASE OUR OWN CARRYING CAPACITY BY ELIMINATING COMPETING SPECIES, BY IMPORTING LOCALLY SCARCE RESOURCES, AND THROUGH TECHNOLOGY, THIS DEFINITION SEEMS IRRELEVANT TO HUMANS.”¹

 ***“Since not all countries can be net importers of carrying capacity, the material standards of the wealthy cannot be extended sustainably to even the present world population using prevailing technology.”¹***

 **At a biospheric level, the concept of carrying capacity is still valid. The ability to increase carrying capacity by moving resources to another location is a deadly illusion.**





 **Damage to the Biosphere, which is the result of treating it as a global commons, is reducing global carrying capacity and is the major issue of the 21st century.**

 ***“WE CAN NOW REDEFINE HUMAN CARRYING CAPACITY AS THE MAXIMUM RATES OF RESOURCE HARVESTING AND WASTE GENERATION (THE MAXIMUM LOAD) THAT CAN BE SUSTAINED INDEFINITELY WITHOUT PROGRESSIVELY IMPAIRING THE PRODUCTIVITY AND FUNCTIONAL INTEGRITY OF RELEVANT ECOSYSTEMS WHEREVER THE LATTER MAY BE LOCATED.”¹***

-  **Abundant scientific evidence indicates that excessive anthropogenic greenhouse gas emissions are damaging the Biosphere, which is the source of all renewable resources that are the raw materials of the human economy.²**
-  **Carbon dioxide from fossil fuels is clearly in excess of biospheric assimilative capacity as evidenced by oceanic water changing from mildly alkaline to mildly acidic, which is harming the marine biota. The acid could become corrosive if present trends continue.**
-  **Just the numbers on ecological overshoot/debt are enough to indicate that humanity is beyond Earth’s carrying capacity.**



SINCE ANTHROPOGENIC CARBON DIOXIDE EMISSIONS ARE AN IMPORTANT FACTOR IN CLIMATE CHANGE, HOW SHOULD THEY BE REDUCED TO BE AT OR BELOW THE BIOSPHERE'S ASSIMILATIVE CAPACITY FOR THEM?

-  **All governments could be assigned emissions rights on a per capita basis according to population size.**
-  **Such an approach would require a major per capita reduction in carbon dioxide emissions in high-emissions countries as vast differences exist in metric tons per capita CO₂ emissions.³**
-  **Economic and human population growth have created ecological overshoot/debt and simultaneously increased anthropogenic wastes (e.g., carbon dioxide) so that they exceed biospheric assimilative capacity.**
-  **Going below the Biosphere's assimilative capacity for greenhouse gases would add a safety factor that would be very prudent.**



AS THE RESULT OF EXCESSIVE GROWTH “WE ARE SEEING CLIMATE DISRUPTION LEADING TO RISING FOOD PRICES, LOSS OF BIODIVERSITY, DETERIORATING ECOSYSTEM SERVICES, INCREASED CHANCES OF VAST EPIDEMICS AND NUCLEAR RESOURCE WARS AND A GENERAL REDUCTION IN THE ODDS OF AVOIDING THE FIRST CATASTROPHIC COLLAPSE OF A GLOBAL CIVILIZATION.”⁴




🌍 ***“Will the additional 2 billion people projected to arrive by 2050 have the same environmental impact as adding the last 2 billion? . . . To support 2 billion more, it will be necessary to farm ever poorer lands, use more dangerous and expensive agricultural inputs, win metals from ever-poorer ores, drill wells deeper or tap increasingly remote or more contaminated sources to obtain water, and then spend more energy to transport that water ever greater distances. All this will require vastly more energy than is now used. As a result the next 2 billion people probably will do disproportionately much more damage to our life-support systems than did the last 2 billion. Of course, if humanity got serious about protecting the environment, and now especially the atmosphere, the next 2 billion could do less damage.”⁴***






THE QUESTION OF THE 21ST CENTURY IS: WHICH WILL COME FIRST – COLLAPSE OF THE BIOSPHERE , A PANDEMIC DISEASE, OR ENLIGHTENMENT ABOUT CARRYING CAPACITY?

- 🌍 Although no biospheric collapse has occurred during the brief time *Homo sapiens* has been on the planet, one is possibly, even probably, now in progress. Moreover, each of the five great extinctions differed from the others. Multiple temporary steady states may occur during a collapse.
- 🌍 Crowded, unsanitary refugee camps are an ideal location for the origin of a pandemic disease. The Black Death resulted in more resources per capita in Europe but is far from an ideal way to balance resources and population.
- 🌍 “*When the time is ripe, human societies have shown an incredible ability to shift gears and move in a new direction.*”⁴ World War II is often used as an example of how a society (the United States) can rapidly shift gears. However, the attack on Pearl Harbor was dramatic and unmistakable. Climate change is gradual and not as urgent to most people.




THE COLLAPSE OF THE PRESENT BIOSPHERE WOULD RESULT IN MANY MORE DEATHS THAN WORLD WAR II, BUT WOULD INITIALLY BE LESS DRAMATIC THAN A BOMBING RAID.

-  Complex ecosystems probably have one or more equilibrium stages during a collapse. Since the present Biosphere consists of a large number of ecosystems, it may have one or more equilibrium stages as well, but, at present, no robust scientific evidence exists on this possibility.
-  The collapse of the present Biosphere would almost certainly require humanity to become more adaptive than protecting and nurturing the present Biosphere would require.
-  Some evidence indicates that the business community is becoming more aware of climate change thresholds – *“A group of 285 large investors, representing more than \$20 trillion in assets, urged world governments to forge a binding treaty at upcoming climate negotiations . . . ”*⁵

THE SCARCITY OF FOOD AND POTABLE WATER FOR OVER A BILLION PEOPLE, PLUS CROWDED, UNSANITARY REFUGEE CAMPS INCREASES THE PROBABILITY OF BOTH EPIDEMICS AND PANDEMICS (WORLDWIDE EPIDEMICS).


-  **Epidemics and pandemics are not compassionate ways to reduce Earth's carrying capacity for humans, but it is the default position if humankind lacks the courage to face the problem now.**
-  **Starvation, misery, and disease are also not compassionate ways to keep Earth's human population within Earth's carrying capacity for humans.**
-  **Three billion + more additions to Earth's already overcrowded human population is predicted for the 21st century. Will humanity's inability to have a free and open discussion of this issue result in starvation and misery for billions in the 21st century?**

OPTIMISM IS JUSTIFIED FOR WHAT SOCIAL EVOLUTION COULD DO WITH INFORMATION ON GLOBAL CARRYING CAPACITY OF THIS PLANET FOR HUMANS, BUT NOT FOR WHAT WILL BE DONE.

-  *“... [scientific] tools are enabling scientists to look at human changes to the planet’s atmosphere, hydrology, lithosphere, and biota – and infer which changes are profound enough to be measurable millions of years hence.”⁶*
-  **Social evolution requires information feedback about biospheric health and integrity, so how disturbing to learn that “*Two popular Southern California fisheries have collapsed right under the noses of management agencies that had inadequate data . . .*”⁷**
-  **Robust social evolution is unlikely to preserve the present Biosphere while well financed anti-science attacks are being given prominent coverage by the news media.**



EFFORTS TO PRESERVE THE PRESENT BIOSPHERE MUST CONTINUE SO THAT FUTURE GENERATIONS HAVE A HABITABLE PLANET.

 If the present Biosphere collapses, *Homo sapiens* will not likely survive the long transition until the next Biosphere is formed or the conditions that will result at that time.

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