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Sustained emergencies

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SUMMARY

Emergency situations require more resources than normal operations. If human society does not address environmental problems effectively before they reach the emergency stage, life from then on will be in a sustained (indefinite) state of emergency. Sustainable use of the planet requires optimal use of resources, which can be facilitated by avoiding sustained emergency conditions. Some emergencies beyond human control will always occur, and adequate global resources must be allocated to cope with them. However, a huge number of emergencies is simply the result of failing to take precautionary, preventative action in time.

There is no defense, except stupidity, against the impact of a new idea.
P.W. Bridgman

What a country chooses to save is what a country chooses to say about itself.
Molly Beatty
Director, US Fish and Wildlife Service, 1992–1996

If humankind fails to address and take precautionary measures to reduce markedly the present emergencies, such as global warming, both short- and long-term existence will probably be devastating. This predicament is due to humankind's limited perception of time and spatial scales. For almost all the 160,000 years that *Homo sapiens* is thought to have been on Earth, a restricted view has had no negative consequences, that could be perceived, for either individuals or small groups (e.g. tribes). Despite, or perhaps because of, this limited perspective, humankind is carrying out a global experiment not likely to be favourable in the long term to the human species. Economic globalization has turned the planet into a global commons where anyone can generally extract resources (e.g. trees and whales), regardless of the effect upon other species, other humans, and posterity (Cairns 2003). The commons was comparatively easy to manage when humans lived in small groups and were scattered thinly over the planet. At present, humans exist in huge groups without the societal evolution necessary to cope with this new situation. The result is a 20% ecological overshoot (Meadows *et al*. 2005). Overcoming this overshoot will require a dramatic increase in the rate of societal evolution, which, fortunately, has already begun. Of course, this non-sustainable condition will be resolved either by nature's laws or societal evolution. The latter, if effectively managed, will result in far less human suffering.

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In 1948, my mentor Ruth Patrick used the phrase 'use without abuse of natural systems,' which is the essence of sustainability. At that time, I naively believed that scientific evidence would convince people to cease the damaging of natural systems. However, at present, the United States Fish and Wildlife Service Director, Dale Hall, of the southwestern region has asked his staff members to limit their use of the latest scientific research on the genetics of endangered biota when deciding how best to preserve them (Barringer 2005). In addition, a US federal court involving Oregon coast coho salmon ruled that, because no basic genetic distinction is evident between hatchery fish and the wild population, both types have to be counted when making a determination that the species is endangered. The cornerstone legislation from the US Congress (the 30-year-old Endangered Species Act, particularly the critical-habitat provision that constrains development in certain biologically sensitive areas necessary to species rehabilitation) is being regarded as an obstacle to economic development (Little 2004).

Biodiversity is essential for all life on the planet (ENS 2005a). Keeping the biospheric life-support system healthy by maintaining adequate biodiversity is humankind's insurance that a supply of species will be available to adapt ecosystems to a changing world. However, biotic impoverishment is now caused to a major degree by human choices. For example, the Hong Kong Disneyland Hotel hosts Chinese banquet receptions that cost from US$1472 to US$2080 per table (Watson 2005). In Hong Kong, each bowl of shark fin soup costs about US$400. Ironically, this practice will leave a less habitable planet for the descendants of the people whom the banquet honours. The deleterious effects of the loss of sharks in oceanic ecosystems are not immediately perceived by many people.

In addition, humankind must put a limit on its alteration of the hydrologic cycle or pay a severe price. The Dead Sea shoreline is visibly receding (Anderson 2005). Commercial evaporating ponds in the Dead Sea, for obtaining salt and minerals, are thought to account for 25–30% of the annual water level drop. Moreover, the Jordan River now delivers less than 100 million cubic meters of water to the Dead Sea because upstream sources have been diverted for other uses. Migrating birds have lost a major stopover point, so the effects are more than local.

Brazil's President Lula chastised those persons responsible for the illegal logging and land clearing that is destroying the Amazon rainforest (ENS 2005b). President Lula remarked that some people are infuriated by the simple fulfillment of the law. Where environmental problems are concerned, this problem of illegal practices applies to a large portion of the planet.

Unsustainable practices are causing a variety of problems other than such well publicized examples as global warming. For example, the US Federal Bureau of Investigation has sounded an alarm because animal and environmental militants are now the largest terrorist threat (Usborne 2005). In addition to protests, terrorists are using such tactics as incendiary devices against what they regard as environmentally damaging developments in the government. Another facet of this rapidly developing sustainability crisis is a new mass of environmental refugees who are leaving their homeland in search of a better life (Milan 2005). The United Nations and most nation/states are accustomed to political refugees, but virtually no attention is being given to the environmental refugee problem, which Director Klaus Toepler of the UN Environmental Program estimates will number 50 million by 2010.

Steps can be taken to alter the trend of growth in unsustainable practices. For example, institutional investors are supporting shareholder resolutions that seek greater analysis and disclosure from ExxonMobil Corporation about its management of the financial risks posed by global climate change (ENS 2005c). Moreover, British leading industrialists have stated that they recognize climate change as a major challenge that requires significant attention from businesses, even if policies within the industrial community cannot be implemented until they know what future government policies will be (Harrabin 2005).

Disturbing misapprehensions still exist. The World Bank and the World Wildlife Fund just announced a 5-year program to reduce the destruction of forests by 10% annually in an attempt to combat the alarming disappearance of the planet's trees (Lederer 2005). Even if successful, this attempt will neither stabilize the loss of natural capital nor the ecosystem services it provides. With an ecological overshoot of approximately 20%, this news is hardly reassuring, although, if successful, it might buy more time to achieve sustainable use of the planet.

A sustained emergency occurs when unsustainable practices are slowly replaced with sustainable practices while humankind perpetually develops new, unsustainable practices at a significant rate. Humankind has embraced economic and social policies that collectively have resulted in an ecological overshoot in the last decades of the twentieth century and has continued and worsened in the twenty-first century (e.g. Wackernagel *et al*. 2002; Meadows *et al*. 2005). If these policies are not markedly changed, large numbers of humans will suffer and die, and *Homo sapiens* could even become extinct. An epochal mismatch exists between the human demands placed on planetary resources and the rate at which they are regenerated. Although the word *apocalyptic* is usually used in a pejorative sense, most dictionaries define it as predicting or presaging imminent disaster and total or universal disaster. Scientific evidence indicates that evolutionary processes will persist as they did during the previous five major mass extinctions; however, so far, the recovery has been over geologic time. Of course, in at least one instance, less than 10% of the species survived—not universal disaster for living systems, but disaster for the species that went extinct. A homocentric view suggests that major climate change could result in universal disaster for *Homo sapiens*. Climate change, including global warming, could reduce Earth's biological capacity, but humankind's demands on nature would not be reduced unless comparable reductions occurred in human

population size and/or material standard of living. Many nations already have ecological deficits because their demands on nature exceed biocapacity (Global Footprint Network 2005).

An ecological emergency is one in which the ecological footprint of humankind exceeds the carrying capacity of Earth. This overshoot has persisted since about 1980, and all the major factors that contributed to it have worsened. Until the ecological footprint is below Earth's carrying capacity, the word *emergency* is surely justified. I remain optimistic about what can be done to achieve this goal, but am pessimistic about what will be done. The literature on the effect of greenhouse gases and other climate changes indicate that conditions are worse than they appeared to be a decade ago. The global energy crisis will almost certainly reduce the production of greenhouse gases, but the ecological lag time before anthropogenic climate change ceases may be decades or longer, especially if coal replaces petroleum to a major degree.

What should be done about the ecological overshoot? Median projections are for a global population of nine billion by 2050, which will result in an even worse ecological overshoot if present trends continue. Many countries are already in a very precarious condition. Clearly, countries, such as Albania (Woodard 2005), will need assistance from external sources for any hope of achieving sustainable use of the planet. Klein (2005) calls attention to a recently created US White House Office of the Coordinator for Reconstruction and Stabilization headed by Carlos Pascual, former US Ambassador to the Ukraine. Klein (2005) remarks that a government devoted to pre-emptive deconstruction now has a standing office of pre-emptive reconstruction. While the focus of the new office is on post-conflict situations, a persuasive case for such an organization could be made for all poor countries with destabilizing practices (e.g. unsustainable). Without question, unsustainable practices must be replaced with sustainable practices—an extremely stressful requirement for both wealthy and poor countries. However, reconstruction is, at present, an extremely lucrative undertaking, often benefiting outside contractors more than the people inhabiting the damaged area. If the reconstruction is intended to build a sustainable society, the indigenous people must be deeply involved; sustainable use means indefinite use, so the local population must understand the goals and practices in order to perform adequately. All sustainable societies must be dynamic, which requires considerable literacy on how to maintain the adaptive methods and procedures necessary to ensure system integrity. Also, all regions and nations have unique ecosystems and cultures, so the approach cannot be a 'one-size-fits-all' plan. Since no nation has achieved sustainability, no national models are available, although sustainable practices can be modeled. In short, reconstruction should maintain the diversity of ecosystems and cultures to the maximum degree possible. On the other hand, nations with unsustainable practices should not be assisted in any way so that they can continue them.

Sustainable use of the planet is not possible with an ecological overshoot, whose primary causes are (1) exceeding Earth's carrying capacity and (2) damage to the biospheric life-support system, which reduces carrying capacity. The two most obvious remedial measures are (1) reduce humankind's demands upon the biospheric life-support system so that it remains in robust condition to protect natural capital and the ecosystem services it provides (i.e. keep the ecological footprint within sustainable limits) and (2) repair damaged ecosystems so that natural capital and the ecosystem services it provides are markedly superior to the present condition. These systems can be severely damaged in days (e.g. oil spills) and may take years to recover. If global warming advances too far, restoration to present conditions may not be possible. Evolutionary processes will produce new systems, but they are unlikely to be as favourable to humankind as the present systems.

The world's many poor countries do not have the resources to end the present environmental emergency. They must be helped by the comparatively wealthy countries to eliminate the ecological overshoot because achieving sustainable use of the planet must be total — not selected portions. Along these lines, McCarthy (2005) notes that the biggest ever assault on environmental protection in Britain will be carried out by the Conservatives if they win the next general election. A recent article (Independent News 2005a) lists Tony Blair's view on climate change and the environment last year, although his view has not been emphasized in the present election campaign. If the UK is seriously considering major reductions in environmental protection only one year after the Prime Minister described the environment as the most important issue the UK faces, it seems unlikely it would send significant financial and other resources to assist Albania and other poor countries to cope with their environmental problems. It appears that UK political leaders are ducking green issues (Independent News 2005b). The United States is facing the same types of problems as the UK, but US President George Bush has never indicated that the most important issue is the environment.

Since an ecological overshoot already exists, the belief that all Third World countries can be brought up to resource consumption levels of wealthy countries is simply unfounded. In addition, passionate resistance will arise against any attempt to limit or reduce economic development. For example, in 2004, China's economy was expanding at 9.5%, Argentina at 9%, and India at 7.3% (Jimenez 2005). The approximate doubling times in years are: China 7.6, Argentina 8, and India 9.9. Thus, the world's two most populated countries had very short doubling times. The United States, which accounts for 21% of gross world product, increased output by 4.4% in 2004, with a doubling time of approximately 16.36 years. Even if the human population remained stable, its economic growth rates would not be sustainable. Even the comparatively modest growth rates of the European Union, about 1.5% with a doubling time of 48 years, would not be sustainable with the current ecological overshoot.

Although Japan's economy has grown by 2.6%, it is still contributing to the sustained emergency by nearly doubling its take of minke whales in the Antarctic Ocean (ENS 2005d) and endangering the minke whale brood stock of other nations, such as Australia where these migratory whales attract many thousands of international and

national tourists. Ironically, Japan is defining its increased catch as research, despite statements of scientists that the research could easily be carried out by non-lethal methods. Other examples also show that humans are disrupting the balance of nature. In Alaska, wolves are being exterminated so that hunters can bag more moose and caribou, which have, at present, decreasing numbers (Economist 2005). Spawning salmon, whose legendary 'runs' attract tourists to Alaska and make tourism the second biggest industry after oil, are being eaten by bears. Since bears reproduce slowly, killing even a few to enhance the tourism industry with salmon could have a major ecological impact. These examples were chosen because they represent different levels of societal disruption of natural systems. The whales inhabit one of the planet's common grounds, the oceans. In this case, all nations and all humankind must embrace sustainable practices. Sustainability becomes more probable if the cumulative impact of small decisions favours preserving the integrity of natural systems. If a significant number of individuals or social groups do not restrain their impact on natural systems, sustainable use of the planet will not be achieved.

All environmental issues are legitimate subjects for debate, and, when the debate is based on validated evidence developed by credentialed scientists, it can be very productive. The attempt to make science subservient to political ideologies is particularly disturbing. Since I joined the Academy of Natural Sciences in Philadelphia, PA, USA, in 1948, I have been inundated with the same platitudes.

(1) Economic growth cannot be impeded by environmental protection.

Environmental protection is necessary for the planet's life-support system, without which the economy ceases to exist. After nearly 60 years, a much larger group of people recognizes this reality; however, economic growth is still the major goal.

(2) Technology can be developed to solve all environmental problems.

Since 1948, technology has grown at an unprecedented rate, but it is creating problems faster than it can solve them. In short, technology is creating new emergencies rapidly, but technological solutions to environmental problems have not kept pace. This situation alone ensures a sustained emergency. Of course, the emergency will be sustained only while humankind is around to create problems that thwart the achievement of sustainability. The very important food shortage was supposed to be eliminated by the 'green revolution,' which was touted as the solution to Third World hunger; however, it has not been effective in doing so. In fairness, the green revolution could hardly be expected to do so when the human population has been increasing exponentially. Ironically, birth control technology is not readily available to those who want it. In addition, global warming is likely to reduce significantly the global food supply (Pullella 2005).

(3) Another variant of the technological solution is that resources are infinitely substitutable (e.g. Simon 1981).

Locke (1689, reprinted 1965) proposed that humankind could transform Earth into economic resources. He did not believe that nature—the biospheric life-support system—had a value more basic than any human economic value. Regrettably, this attitude still persists. Governor Blairo Maggi of the Brazilian state of Mato Grosso (the world's largest soya bean producer) expressed no concern during his first year as governor over the rate of deforestation (e.g. for soya plantations), which more than doubled in 2003 (McCarthy and Buncombe 2005). In an interview in 2004, Governor Maggi stated: "To me, a 40 percent increase in deforestation doesn't mean anything at all and I don't feel the slightest guilt in what we are doing here. We are talking about an area larger than Europe that has barely been touched, so there is nothing at all to get worried about" (McCarthy and Buncombe 2005). Although this view is not uncommon worldwide, few people are as outspoken about it.

CONCLUSIONS

The working title of this article was *sustainable emergency*; however, I changed it to *sustained emergencies* because this title seems more appropriate. The emergency is sustained if humankind persists in unsustainable practices—at least until a major ecological disequilibrium occurs that reduces human population size. *Sustained* is more appropriate, however, because the emergencies are steadily increasing and likely will worsen if significant global climate change continues. Most major issues will not likely be resolved in the twenty-first or even the twenty-second centuries. Resistance to social change is the most formidable obstacle, even though alternative sustainable practices are available to replace unsustainable practices. The illustrative emergencies mentioned in this article represent only a tiny portion of those that could be listed.

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