The Unmanaged Commons

A major challenge for sustainability ethics

by John Cairns, Jr.

Why another article on the commons when Garrett Hardin has covered all the major issues so superbly? There are new developments that did not exist in the many decades during which Hardin's writings became so famous: worldwide concern has heightened about the global environment since 1961 when Hardin wrote the classic "The Tragedy of the Commons" and sustainable development has attracted international interest, and even some implementation.

Economic globalization has turned the entire planet into common ground. Access to the commons need not be physical as originally envisioned by mathematician William Foster Lloyd in 1833. Economic access enables individuals and organizations to exploit far distant resources and avoid responsibility for the consequences even better than when the commons are exploited by local inhabitants. The global commons is unmanaged in an ecological sense and even in an economic sense if economic development ignores humankind's responsibility to its descendants and other species. The basic theorem of ecology is that it is impossible to do just one thing.

Exponential growth has some intended consequences (largely touted) and multitudinous unintended consequences (studiously ignored).

Sustainable use of the planet requires that humankind do nothing that seriously depletes and/or damages both natural capital and ecosystem services. In a less populated world, the need for a sustainability ethic was not as great as now. However, humankind now lives in a crowded world, so that leaving a habitable planet for future generations of humans and those of other species is problematic.

A tribe said to the universe,
"Sir, we exist!"
"So I see," said the universe,
"But your multitude creates in me
No feeling of obligation."
– Garrett Hardin

[Author note: Substitute "humankind" for "tribe" for a superb description of the present situation facing an unsustainable society.]

A Wider View of the Commons

Environmental health is essential to human health since humans are embedded in the interdependent web of life. Two current developments justify additional attention to humankind's relationship to the global commons: The interest in sustainable development requires, at its core, informed and compassionate use of the global commons; and many more examples are available of the consequences of unsustainable practices.

On the negative side is the strong probability that the attractive word in the term *sustainable development* is *development*. Most people associate development with growth and the continuation of present lifestyles, with only a few minor adjustments and new technologies. It is clearly not accidental that the word *development* was chosen to describe ecological aspirations because the word goes quite well with *smart growth* and similar reassuring "buzzwords." It would be a pity to miss an opportunity to protect the global commons because of problems with semantics.

Hardin's (1968) "The Tragedy of the Commons" is, arguably, the key paper on ethical issues in the use of the commons. As of 1997, this seminal paper had been

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reprinted over 100 times in anthologies in the fields of biology, ecology, environmental sciences, law, economics, sociology, political sciences, philosophy, ethics, and English composition and is one of the most frequently cited articles in *Science*. A special issue of *The Social Contract* (Vol. XII, No. 1, Fall 2001) honoring Hardin provides a superb overview of his key topics and issues from 1968 to the present. Basically, tragedy is the inevitable price paid for unmanaged, unlimited freedom in use of the commons. The quest for sustainable use of the planet mandates responsibility for the commons. As Hands (1973) remarked, traditional ethics has almost entirely ignored the rights or claims of posterity; sustainability ethics focuses on leaving a habitable planet for posterity.

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The reason for the emphasis on Hardin's publications is that he has addressed many of the important issues affecting sustainable use of the planet, yet they have not been given the attention they deserve in publications on sustainability. I have avoided discussion of population issues for many years because it seemed abundantly clear that all of the pivotal issues regarding human population size had been discussed, not only by Hardin but also by Paul R. Ehrlich, Lester Brown, and others. However, my avoidance of this issue was a serious error!

Not only human population issues but also those involving the 30+ million species with which humankind shares the planet must be continually discussed until action is taken about the addictive, unsustainable practices humankind perpetuates. As a student and early in my professional career, I was told that science and ethics should not be commingled. However, all environmental problems, arguably without exception, involve value judgments (i.e., ethics or ethos) that are best implemented with scientific evidence. Naturally, clear indications must be made of which category each component of the proposed solution belongs.

Sustainability Ethics

Catastrophes cannot be entirely eliminated because many are the result of natural forces, such as earthquakes. However, catastrophes resulting from human practices can be reduced both in frequency and magnitude. The question is how to reduce the misuse of the global commons. The impasse presently occurring over greenhouse gases illustrates the difficulty of nation-states being effective outside of their own borders, or, in some cases, even within their borders. In addition, the United Nations has neither the staff nor the power to become the global environmental police force. From a sustainability perspective, damaging the global commons damages natural capital, ecosystem services, and the interdependent web of life that constitutes the planet's ecological life support system. No individual, organization, or nation-state has the "right" to damage these entities.

The illusion of an infinitely generous "Mother" Earth has masked the harsh reality that organisms without a suitable habitat die. The present use of the global commons is ruinous and unsustainable, and, in the long term, humankind does not benefit from damaging the global commons. In the short term, some individuals, organizations, and nation-states do benefit. The basic question becomes: how can human society best serve future generations of its own and other species while filling the basic needs of those now living? A truly socialized individual is ashamed to violate the social contract that aspires to sustainable use of the planet. However, the word *shame* is rarely used in this permissive era.

Cairns (2003) has produced a list of ten declarations that are focused on a mutualistic relationship between humankind and natural systems whose goal is leaving a habitable planet for human descendants and those of other species. Sustainability ethics differs from eco-ethics (e.g. Cairns, 2002, in press; Kinne, 2002) – sustainability ethics is both homocentric and ecocentric, while eco-ethics is entirely ecocentric. One might easily conclude

that there is no substantive difference because humankind cannot survive without natural capital and ecosystem services. One should also recognize that nature is not designed to protect a single species, even if that species is capable of thinking it is the most important species on the planet. However, the implementation of sustainability ethics would, at worst, prolong humankind's stay on the planet.

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Both sustainability ethics and eco-ethics deplore unsustainable practices that impair ecological integrity and increase biotic impoverishment. Both are expressions of deep concern about the exponential growth of the human population and consumption of material goods. Sustainability ethics is a consilience (literally, leaping together) of econ-ethics and eco-ethics (as revisited by Kinne, 2002).

Cairns (2003) also provides an illustrative list of ten sustainability ethics for nation states; they are even less likely to be accepted than either sustainability ethics or eco-ethics. All of the statements pledge that ensuring environmental integrity is the primary goal. The wide gap between these statements and the approach in the U.S. is illustrated by Walsh's (2003) recent analysis of President Bush's current policy on greenhouse gases. The basic problem is that the policy is based on how much reduction, if any, the industries that produce the gases can endure, rather than how much anthropogenic greenhouse gases the planet can tolerate. Such a policy does not include an ethical responsibility for the planet's biosphere.

Such attempts to "solve" environmental problems will not be successful in developing a harmonious relationship with the interdependent web of life. The U.S. greenhouse gas policy is based on voluntary agreements with industry to reduce global warming emissions. A number of industrial trade associations have announced that emissions goals were based on emissions per unit of output (i.e., intensity based). Voluntary commitments have not proven effective in the past, and, even if they were, nothing indicates that the biospheric life support system would be healthy, or even in good condition, as a consequence. As Walsh (2003) notes, even government projections show that U.S. greenhouse gases will continue to grow over the next 10 years. The result may be crossing a major ecological threshold that could place global climate at risk and seriously threaten the global commons.

The well-known Kyoto Protocol placed mandatory caps on emissions, which are vastly different than intensity goals that use the ratio of emissions to economic output. Environmental groups support a goal of reducing total emissions into the atmosphere, regardless of the size of the economic output. In a growing economy, the actual emissions into the atmosphere might well increase. On a finite plane, the size of the atmosphere cannot be expanded to match the growth of the economy. Ethical use of the global commons requires recognition that it is both finite and vulnerable.

James Carville, aide to former President Bill Clinton, was fond of saying, "It's the economy, stupid!" To paraphrase Mr. Carville, "It's the planet, stupid!" In short, the global commons deserves tender, loving care. What is the benefit of energy production that also generates unacceptable levels of greenhouse gases if humankind lacks a habitable planet on which to use this energy? Sustainability ethics are essential to a perpetually habitable planet.

The Ocean Commons

This common ground covers over half Earth's surface. If this commons is seriously damaged, it probably will be impossible to restore it to the pre-industrial era condition. Unsustainable practices (e.g., over-harvesting fisheries stocks, toxic and sewage pollution, coral reef damage, littering with plastic and other solid wastes, and nuclear waste, etc.) have already caused serious ecological damage, and the situation is rapidly worsening. Using the oceans as an unmanaged commons has failed (e.g., Miles, 1999). Management on this scale is daunting, but essential to sustainable use of

the planet.

Lindholm and Barr (2001) note that, in the U.S., a wide disparity exists between the total land and ocean under federal management. Of the total U.S. landmass, approximately 18 percent is included in some form of protected area. In contrast, of the total area of U.S. waters within the 200-mile Exclusive Economic Zone, only 0.4 percent is presently under Federal protection, with a much smaller percentage, 0.0004 percent, actually contained in non-extractive reserves.

Both land and oceans were once considered vast and limitless. However, even in the U.S., Australia, and Canada where "frontier" views persist to the present day, there is now a perception of a finite planet – Carl Sagan's "small blue dot" in a vast universe. Nevertheless, recognition of the need to cease unsustainable practices and to live sustainably is far from universal. Decades ago, Aldo Leopold perceived the need for a "land ethic." Now Safina (2002-2003) and Barr and Lindholm (2002-2003) propose a "sea ethic" using Leopold's land ethic as a model.

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Although Aldo Leopold's land ethic has been widely acclaimed by those concerned with the environment, it has not been practiced widely, probably because most politicians and the average citizen have not even heard of the concept. The land ethic needs to be updated, especially with regard to sustainable use of the planet. Time is running out for humankind to implement either ecological ethics or sustainability ethics. If not implemented, nature's laws will become evident, whose consequences are not humane, as most people define this word.

Nation-State Environmental Terrorism

Hunt (2003) estimates the cost of Iraq's torching its oil fields at US$10 billion for only oil field repairs. Collateral effects, such as damage to human health and the environment, appear to be forgotten extras. Some useful information on environmental terrorism of this type comes from the Gulf War, which began when Iraq invaded Kuwait in 1990 and, in one day, gained control of 22 percent of the world's exportable oil. Had Iraq also successfully invaded Saudi Arabia, Iraq would have controlled 44 percent of the exportable oil (Youngquist, 1997). This situation was clearly intolerable for the industrialized world, which responded promptly with massive, modern, military force. Even with this action, the Gulf Coalition aircraft did not strike Baghdad the beginning of 1991.

Saddam Hussein had threatened to set fire to all of Kuwait's oil wells in retaliation for any invasion by coalition forces. Because of the rapidity of the invasion, not all the wells could be blown up and then set afire, but a large number were torched by the retreating Iraqi forces. At one time, about 4 million barrels of oil were burning each day (Hobbs and Radke, 1992). Some wells were blown up but not set afire, which resulted in large oil pools in the desert. Approximately 11 million barrels entered the Persian Gulf, with devastating environmental impact (e.g., Hawley, 1992). El-Baz (1992) predicted the effect would last for years; no robust evidence refutes this view.

This was nation-state environmental terrorism on a grand scale, and one that may be repeated in twenty-first century post-war Iraq. Despite the fact that the Gulf War spill was one of the largest oil spills in history, it did not attract media attention as did, for example, the Exxon *Valdez* spill in Prince William Sound, Alaska. This lack of attention is disturbing since, to protect the global commons, there must be worldwide indignation when the integrity of the commons is impaired.

Public Opinion: The New Superpower?

Tyler (2003) asserts that two superpowers may exist on the planet: the U.S. and world public opinion. His theory is based on the sentiment of people around the world who felt that the evidence on which President

Bush depended was not adequate for going to war against Iraq in 2003. The pivotal issue, in this case, for the United Nations Security Council was: what is the rationale for military operations? Tyler (2003) feels that, although the fresh outpouring of antiwar sentiment may not be enough to dissuade President Bush or his advisors from the preparations for war with other countries that appear to support terrorism, it is a persuasive reminder that any rush to war may have unfortunate political and environmental consequences for nations, organizations, and individuals who support a new war now. No war benefits the global commons.

What does public opinion have to do with protecting the global commons? Politics are affected by the psychology and momentum of public opinion. Even for a complex, multivariate issue such as the ecological integrity of the global commons, the majority of people now feel a sense of unease about how deteriorating ecological integrity could have adverse effects upon their lives (e.g., environmental refugees) and the lives of their descendants (e.g., depleted natural resources and ecosystem services).

Environmentally literate people, who are aware of adverse effects presented in well-documented studies in the publications of organizations such as Worldwatch and the United Nations, have a sense of barely controlled panic. However, these organizations also present persuasive evidence that sustainable alternatives are available to present unsustainable practices. For example, sustainable alternatives are biological controls for pests and wind power or solar power to replace the use of fossil fuels. Evidence also is available that ecological restoration can repair some of the damage to natural systems. Arguably, the cost of unsustainable practices mounting, often at an appalling rate, is evident everywhere on the planet.

Powerful economic forces defend the status quo. However, natural capitalism (e.g., Hawken et al, 1999) offers a competitive, economic alternative. Excep-tional phenomena now occurring on the global commons, e.g., endocrine disruptors, biotic impoverishment, and melting glaciers, encourage the move toward sustainable use of the commons. Moreover, ethics is becoming an increasingly important piece of the decision making process. The term *carrying capacity* (a term well established in ecological literature) has been rejected a pronouncement by "prophets of doom." Hardin (1976) has an excellent discussion of the ethical issues involved.

Economics and the Global Commons

Economic growth is a high priority goal for elected politicians, especially those with short terms of office. Not surprisingly, economic growth is the goal of all third world nations whose per capita wealth is shockingly low. Concomitantly, many mainstream scientists now consider the planet to be in the midst of the sixth great wave of animal extinctions. The fifth wave, 65 million years ago, was notable as the time of extinction of the seemingly invincible dinosaurs (e.g., Wilson, 1992).

The sixth wave of great extinctions is unique, being caused by humankind rather than natural causes. The twentieth century was a notable period of astonishing global-wide habitat change. The human population exploded from 1.6 billion to over 6 billion. In three decades (1960-1990), 20 percent of the world's tropical forests were cut and burned; estimates of total deforestation rates vary from 50,000 to 170, 000 square kilometers per year. Quality habitat (e.g., old growth forests) and other habitat losses (e.g,. tall grass prairie) are responsible for many species extinctions.

From a sustainability standpoint, extinctions are only the final stage in the decline of a species. Species cease functioning as critical components of the ecological life support system long before they disappear entirely. Species can be saved if damaged ecosystems are restored in time. Restoring damaged ecosystems is a much more complex process than conserving them (e.g., National Research Council, 1992). In strong contrast to these views, Lomborg (2001) espouses the view that claims of environmental damage are exaggerated. Many powerful financial interests and media want to believe this "happy times" conclusion.

Those wishing unrestricted access to the global commons have enormous financial resources, some of which were acquired from resources obtained from the global commons. Those favoring limited access to the global commons are not without financial resources, but their finances are orders of magnitude less than those of organizations profiting from resources obtained from the global commons, discharging wastes into the global commons (e.g., air pollution), and producing hazardous products that are used on private property but end up, in part, in the global commons (e.g., pesticides, radioactive wastes).

The willingness to place short-term financial gains ahead of public safety in the attempts to circumvent the travel restrictions designed to restrict the spread of SARS is an example. Fears of loss of tourism and other revenues dependent on travel prevailed. Although China had belatedly taken significant steps to prevent spread of this disease, world financial interests pointed to the subsequent low numbers of deaths from SARS as justification for avoiding travel and following other restrictions designed to prevent a worldwide epidemic. In view of this disregard for human health, it seems wise not to count on major efforts by financial institutions to protect the global commons. Recreational or business travel during an outbreak of a transmissible disease does not represent a basic human need. The fact that many people are reluctant to travel until SARS is under control attests to the accuracy of this statement.

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Other elements of economic theory are also a cause for concern. Arguably, the most contentious is the concept of resource substitutability. Simon (1981) and Simon and Kahn (1984) are the most outspoken advocates of the belief that resources are not limiting – when one resource becomes scarce, human creativity (the ultimate resource) will develop a substitute (e.g., alternative energy sources for fossil fuels). One problem of the concept of infinite substitutability is concentration on raw materials such as coal, metals, petroleum, marble, and the like. However, human ingenuity, creativity, and technology are unlikely to find substitutes for ecosystem services at a realistic cost. At present, almost all ecosystem services are free: maintenance of the atmospheric gas balance, decomposition and recycling of organic wastes, maintenance of water quality, biological pest and disease control, pollination of agricultural and other plants, conversion of solar energy (photosynthesis) into food and raw materials that are readily recycled by natural systems, maintenance of the hydrologic cycle, production of fertile organic soils, moderation and regulation of global climate, models for pharmaceuticals, and nutrient recycling. The question of infinite substitutability has not been adequately phrased. Substitutes for copper fuel, fossil fuels, and the like divert the general public, economists, and ecologists from addressing the primary resource depletion.

The planet is running out of natural systems. The primary lesson of Biosphere 2 is that no amount of money can produce a self-regulating natural system that provides services favorable to humankind. In 1991, the US$200 million Biosphere 2 – a sealed, glass-enclosed, 3.15 acre structure – was designed to support eight scientists, the "bionauts," for two years in an environment suitable for them. It contained "miniature ecosystems," which, because of problems of scale, did not function like natural systems. Consequently, air quality declined (Recer, 1996); cockroaches flourished, and insect pollinators died. The estimated cost of supplying inadequate ecosystem services to the few inhabitants in Biosphere 2 was US$9 million per person per year. Clearly, human-made substitutes cannot reliably supply the diverse array of services natural systems supply at little or no cost. Is it reasonable to assume that these natural services should or can be replaced with human-designed ecosystems? The concept of infinite substitutability deserves more rigorous examination. Even if the science were robust and the technology sound and affordable, an ethical problem would still remain – should humankind replace natural systems with human-constructed systems?

Another interesting problem concerns intergenerational equity and fairness. Parfit (1982) wonders how obligations to posterity can be effectively met when present decisions may determine which people are born and even how many will survive. Since those now living do not know the preferences of posterity (Solow, 1993), humankind's primary obligation is to avoid impoverishing future generations through present overconsumption and undersaving.

The basic disagreement between ecologists and economists is with what effect damaging natural systems will have on posterity. In view of the rapid disappearance of natural systems, the probable outcome of endorsing

either viewpoint becomes an ethical/moral decision. Globalization has made it virtually impossible to ensure the future of one's own children unless some provision is made for the children of others.

Ecological deficits should be of great concern to economists, ecologists, and everyone on the planet. Illustrative examples of ecological deficits are loss of old growth forests, loss of topsoil, disruption of the hydrologic cycle, depletion of brood stocks of oceanic fisheries, species impoverishment, depletion of fossil water, depletion of gene pools for models for pharmaceuticals, desertification, and fragmentation of ecosystems.

Basically, ecological deficits occur because natural capital is being used at a greater than replacement rate, which results in diminished ecosystem services (the "interest" on natural capital). Humankind has inherited natural capital that has been accumulating for billions of years. Only recently, in evolutionary time, has humankind had the technology to acquire natural capital at a rate greater than replacement. The assumption that it is a sound business practice to use more and more natural capital, processed by fewer and fewer people should be re-examined. Exponential growth of the human population and exponential depletion of natural capital are not sustainable strategies. The loss of natural capital (e.g., arable lands) is even now imposing severe costs (e.g., Postel, 1999; Brown, 2002a,b).

In Japan in the early 1950s, organic mercury produced a neurological disease (the Minimata disease) that resembled cerebral palsy. This disease was particularly affecting infants and children via fetal development (e.g., Schettler et al., 1999). Schettler et al. (1999) cover damage to both the structure and the function of the human reproductive system by exposure to environmental chemicals. At present, the risks are mostly unknown and unstudied, but exposures continue. Unquestionably, economic and political forces influence both the nature of scientific research and level of public concern about risks. Clearly, these substances will have some, perhaps major, effects upon human health that, in turn, will affect the global economy. Although some exposures are highly site specific, most are sufficiently ubiquitous to be considered as having occurred in the global commons. Enlightened management should reduce these risks markedly, but zero risk is a utopian dream.

Ethics for the Global Commons

Problems resulting from an unmanaged global commons point out the need for developing a preliminary statement of ethics upon which management plans might be made. As Sophocles states: "One must learn by doing the thing; though you think you know it, you have no certainty until you try it." One thing is certain – an unmanaged global commons is a major threat to sustainable use of the planet. A statement of ethical responsibility is, arguably, a good way to develop an equitable, fair management program.

1. I pledge to oppose any activities that impair the integrity of the global commons, including actions of nation-states, corporations, and organizations.

2. I pledge to improve my environmental literacy so that I am aware of threats to the global commons.

3. I pledge to oppose any further increase of the human population on this finite planet.

4. I pledge to oppose a laissez faire market system ruled by conscience alone, since it rewards for lack of conscience.

5. I pledge to oppose all activities that diminish posterity's use of the commons.

6. I pledge to oppose any country that attempts to solve its population problems by exporting people to other countries.

7. I pledge to support social arrangements that enhance responsibility for the global commons, even if they involve arrangements that include coercion of some sort.

8. I pledge to acknowledge that the global commons is effectively limited in its capacity to accommodate use.

9. I recognize that the "right" to use the global commons must be matched by an operational responsibility to nurture and care for it.

10. I affirm that global tragedy is the price that will be paid for misuse of the commons. If humankind's laws do not protect the commons effectively, nature's laws will be activated, not only affecting the transgressors but all of humankind. Any disjunction between rights and responsibilities with regard to the global commons will result in tragic ruin for all of humankind.

11. I will not be misled by accusations of uncertainty and "unsound science" by those who benefit from the status quo. Precision of numbers is not as important as the relative size of the numbers (e.g., human population growth) or the direction of change

(e.g., global warming).

12. I affirm that, on a planet with diminishing natural capital, humankind cannot be governed by ethics that ignore natural systems (ecosystems) and posterity.

13. I pledge to be guided by the basic theorem of ecology that one can never do merely one thing. This pledge is particularly important when exercising "rights" in the global commons.

14. I affirm that access to the resources of the global commons must be controlled (i.e., managed) so that the unscrupulous do not destroy them.

15. I affirm that food and other resources should never be sent to any population that has exceeded the carrying capacity, unless there is persuasive evidence that effective measures have been taken to stabilize the population and a firm time limit has been placed on the period of aid. Charity may often assume an austere and superficially unsympathetic aspect toward the population at risk. As Hardin (1972) remarks: "The morality of an act is a function of the state of the system at the time the act is performed – this is the foundation of situationist, ecological ethics."

16. I affirm T. H. Huxley's statement that every new truth begins as heresy. Management of the global commons now appears heretical, but, as the ecological collapse continues, it may increasingly appeal to common sense.

Conclusions

The health and integrity of the global commons is essential to the quest for sustainable use of the planet. An unmanaged global commons will permit unsustainable practices that may generate impressive short-term profits, but will generate even more impressive long-term losses. Literature on the use and misuse of the commons has existed for decades. However, the increasing evidence of the need to switch from unsustainable to sustainable practices has generated momentum for re-examination of this issue. Moreover, ethics is now becoming an increasingly important component of the decision-making process. Finally, the internet and international television has enabled average citizens to view environmental degradation, often while it is occurring.

Protests are not an ideal way to express opposition to unattractive decisions, but they may be all that is available for expressing dissent. Informed citizens can express both approval and dissent by their purchases in the global marketplace. Even a small shift to "green" purchases may make the difference between profit and loss for many companies.

Sustainable practices will benefit the global commons' unsustainable practices will damage it. The choice is basically based on different value systems and ethical motivation. A paradigm shift to sustainable practices might well occur at a breathtaking rate under these circumstances. An additional effort to protect the global commons is well worthwhile. •

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