

AS I SEE IT

Choosing model nations to set examples for achieving sustainability*

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At one time, the US would have seemed the best choice for a model nation to set the example for achieving sustainability. If Americans lived sustainably, more resources would be available for use by less developed countries. However, playing the famous game of 'What if?' makes the choice of the US as a model nation even less persuasive.

Increased life expectancies, births to American citizens, and legal and illegal immigration, if continued, will dramatically increase the population of the US in the 21st century. In addition, the number of Americans aged 65 and over is projected to increase from 35 million in 2000 to 78 million in 2050 (Schneider 1999), and the present 4 million American citizens at age 65 will expand to 18 million by 2050. Unfortunately, many demographers believe that these projections are underestimates (Schneider 1999).

The US Census shows that 139 million American citizens live in coastal zones. If Florida and other southern coastal areas are typical, a significant percentage of this number is older people. Where will additional retirees live, since the prime areas are already full? These issues are daunting ones that must be addressed during the transition to sustainability.

If future retirees choose coastal areas, the problem could worsen considerably. Over 50% of the American population would be living on 17% of the contiguous land mass. What if the sea level rises? Or worse yet, what if climate change were to cause both a sea level rise and markedly increased storm damage? Depending on the rate and amplitude of the sea level rise, between 10 and 40% of the population residing in the coastal areas could become environmental refugees. What if destroyed seaports cannot be quickly re-established? What if housing, electricity, medical care, etc. cannot be quickly re-established? What if, as seems likely, other nations (which could serve as 'lifeboats') are at or over capacity and cannot help the US? After

all, a global sea level rise would create problems in all areas of the world. The time when migration could be used to solve carrying capacity problems is over. Even if other nations enforced zero net immigration and kept the birthrate at replacement level, they would still experience demographic shifts that would extend at least through the 21st century. This situation will also affect carrying capacity.

What if water supply availability worsens (Postel 1999)? What if the economies of 'lifeboats' are seriously weakened by one or more of the consequences of unsustainable practices?

These questions and many other 'what ifs' (e.g. pandemic disease outbreaks, global resource wars, major reduction of food supplies due to climate change) could indicate that no nation currently has enough sustainable practices to qualify as a model for the rest of the world. What, then, are the attributes of a nation that could serve as a model for achieving sustainability? A few illustrative characteristics follow.

1. The population must stabilize at or below carrying capacity.
2. Unsustainable practices must be replaced with sustainable practices at a rate of at least 5% per year.
3. The citizens and leaders must be both environmentally literate and committed to a well understood set of sustainability ethics.
4. Resources must be directed toward developing and implementing sustainable practices rather than toward war and/or preparation for war (i.e. 'defense').
5. The ecological footprint size should not be more than 20% above the global norm.
6. The use of fossil fuel should be heavily taxed; the proceeds should be used to repair ecological damage.
7. Purely industrial systems should be replaced by hybrid industrial/ecological systems on or before 2050.
8. At least 25% of the land mass must be allocated to the accumulation and protection of natural capital and

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the ecosystem services it provides; the area must be capable of supporting the biodiversity of the region.

9. Dependence on the natural capital and ecosystem services of other ecoregions must be avoided.

10. Neither the global commons (i.e. oceans and atmosphere) may be over-harvested or polluted; nations that exceed limits should suffer the consequences, including sanctions of other nations.

11. The practice of solving overpopulation problems by exporting people to other countries must be abandoned.

12. At least 25% of the natural systems must be self-regulating.

13. Ecosystems that are deliberately or accidentally damaged (e.g. oil spills) must be immediately repaired.

14. Ecosystem health and integrity must be monitored in a systematic and orderly fashion.

15. Persistent toxic or radioactive wastes requiring storage because they cannot be safely introduced into natural systems are banned.

16. Biodiversity is respected and maintained.

17. All human artifacts (including manufactured items) and waste products are designed so they can be recycled in both the technological and natural systems.

18. The well being of future generations of the human species and other life forms have a major influence on behavior.

19. The ultimate criterion for sustainable use of the planet is the preservation and accumulation of natural capital and the ecosystem services it provides.

20. If normal cyclic climatic or other episodic events increase stress on the planet's ecological life support system, human society will alter its practices so as to reduce stress on natural systems to the degree necessary to protect their integrity.

It is probable that no country would qualify as a robust model of sustainable practices. Some evidence (Wackernagel & Rees 1996) suggests that Kerala State (in India) might be a satisfactory candidate, but persuasive information about many of the attributes listed in this commentary (e.g. environmental monitoring, self-regulating ecosystems, ecosystem health and integrity) is extremely difficult to obtain, very likely because it is not commonly generated.

However, a test of congruency could compare the attributes that are ideal for achieving sustainable use of the planet and the actual attributes of a nation or

ecoregion. The percentage of difference between the two could be determined:

$$\begin{aligned} \text{Sustainability Score} &= \text{actual/ideal} \times 100 \\ &= \text{sustainability index} = \% \end{aligned}$$

The list of sustainability attributes in this commentary is illustrative, but what if some type of measurement were a reality — i.e. actually measuring how far along the path of sustainability humankind really is? What if this resultant measurement accelerated the abandonment of unsustainable practices? What if people realized that sustainable use of the planet requires doing more than saying they favor it? Humankind would then know which, if any, nations might serve as models for achieving sustainability. What if progressing along the path to sustainable use of the planet became a primary goal? What if the citizens of each nation improved the illustrative list of sustainability attributes to fit their particular circumstances? What if humankind abandoned denial of the damage it is doing to the ecological life support system and the 30+ million fellow life forms with which it shares the planet?

However, in the far recesses of the mind, two sobering 'what ifs' remain. What if humankind continues its present unsustainable practices for the remainder of the 21st century? What if nature's laws stop the exponential growth of the human population and its concomitant destruction of natural capital and ecosystem services? If humankind continues unsustainable practices until it finds the answers to these last two 'what ifs,' this collapse will demonstrate that the human mind was an evolutionary failure. One hopes that reason guided by evidence, compassion, and ethics will make these two 'what ifs' merely speculative visions.

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