

AS I SEE IT

Allocating finite resources on a finite planet

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Freedom is the recognition of necessity.

Hegel

. . . the tender flower of objectivity is easily crushed by what is taken to be the necessity of the moment.

Garrett Hardin

Humankind faces two major resource allocation decisions in the twenty-first century. (1) What percentage of the planet's resources are essential to keep Earth's ecological life support system (i.e. natural capital and the ecosystem services it provides) functioning? Empirical evidence on this issue is not robust, but persuasive evidence indicates that natural systems are being both degraded and replaced by human artifacts at a rate unprecedented in history. (2) The increasing disparity in resource allocation among members of the human species is shockingly large and still increasing. In a global community that worships economic growth, economists are failing to address the related questions of how long natural capital will last and whether ecosystem services provided by natural capital can be replaced by present technology in a cost-effective fashion. Persuasive evidence exists that both natural capital and the ecosystem services it provides will be seriously, possibly fatally, diminished in the twenty-first century.

Hardin (1974) used the lifeboat metaphor to approach the unresolved problem of the carrying capacity of the planet. An alternative metaphor is Earth as a spaceship (Boulding 1966). Both of these metaphors are useful in determining the sustainability ethics required for this finite planet with finite resources. Metaphorically, the approximately 2 billion comparatively wealthy people are in 'safe' lifeboats, while approximately 4 billion are in dangerously overloaded lifeboats. If one views each nation-state as a lifeboat, what should the occupants of the safe lifeboats do?

A number of important ethical decisions must be made when deciding what occupants of a particular

lifeboat (i.e. citizens of a nation-state) should do. If the nation-states wish to invest in future generations, they should not consume natural capital at a greater rate than it is being regenerated. This decision may mean denying access to immigrants whose lifeboat sank. As Hardin (1974) notes, welcoming these immigrants would mean taking resources from posterity to assist strangers whose lifeboat failed to stay within its carrying capacity. If the persons whose lifeboat sank bring their unsustainable practices with them, then the assisting lifeboat will almost certainly sink; even if it does not, the quality of life for both the individuals in the receiving lifeboat and its descendents will decrease. Only two outcomes are available in this situation. (1) Humankind must exert the moral and ethical disciplines of equity and fairness in resource allocation (i.e. live sustainably). (2) The natural laws that affect all other species will reduce the human population by famine and disease until it reaches a sustainable level. Economic growth has not been 'the tide that lifts all boats'. Economics has had a devastating effect upon natural systems that will, in the long term, reduce carrying capacity.

Both the lifeboat and spaceship metaphors are superb for acquainting people with the carrying capacity concept. Science fiction authors have even increased the carrying capacity of spaceships by using suspended animation of most of the passengers and crew. The expectation in the science fiction realm is that passengers and crew in suspended animation could be reactivated upon a new planet with more resources. This scenario is not a realistic means of long-term allocation of resources. For spaceship Earth,

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a better path is to reduce resource allocation per capita. The southern Indian state of Kerala has a much smaller ecological footprint per capita than the US; Kerala still has a life expectancy and literacy comparable to the US. Moreover, Kerala has a population of approximately 30 million, so it is not a small experimental group. Clearly the state has a high 'social capital' despite a modest per capita allocation of resources.

Agyeman et al. (2003) assert that the issue of environmental quality is inextricably linked to that of human equality. Torras & Boyce (1998) have provided evidence that nation-states with a more equal distribution of income, greater civil liberties, and higher levels of literacy tend to have higher environmental quality. However, Dobson (2003) reluctantly concludes that social justice and environmental sustainability are not always compatible objectives. He feels that rapprochements will only be temporary and transient. However, Dobson prudently notes that, although the view that environmental sustainability is generally regarded as a precondition for everything (including social justice), little empirical research supports this assumption.

Rees & Westra (2003) question the sustainability of the entire human enterprise. They focus on the troublesome interactions of conflicting economic, ecological, political, and social forces that humankind must confront and resolve in the twenty-first century. Wealthy individuals can shield themselves from the worst environmental degradation by living in or moving to areas where conditions are better. Special interest groups abound to protect the privileged status. Myers & Kent (1998) note the large number of lobbyists attempting (and often succeeding) to influence legislation favorable to them in the US legislature.

One of the crucial issues in resource allocation is how 'justice' is defined. *The Random House Dictionary, 2nd Edition*, has two definitions that seem appropriate in this regard: (1) the moral principle determining just conduct, and (2) the administration of deserved punishment or reward. The first definition is homocentric and, thus, determined by human moral and ethical principles. The second could be defined as ecocentric—the laws of nature predominate and humans are just part of the interdependent web of life. If one defines conduct that is just as including all life forms and ecosystem integrity, then sustainability ethics might serve because it aspires to be both homocentric and ecocentric. Ultimately violating nature's laws will result in severe penalties.

Nature usually gives quantity a high priority and from an abundance of individuals selects those with the highest fitness or the ability to fit into the present ecosystem. This viewpoint is not just in terms of the ethical stance professed by a part of human society, for example, professing the worth and dignity of each

individual. If humankind wishes to leave a habitable planet for posterity (i.e. sustainable use of the planet), then obeying nature's laws must have the highest priority. Some individuals (e.g. Agyeman et al. 2003, pp. 3, 4) believe that 'more sustainable societies will only emerge if those societies begin to demonstrate greater levels of material, social, economic and political equality.' The twenty-first century is likely to be a defining era for sustainability initiatives. If they are delayed too long, degraded natural systems may not have the resilience to return to the ecological conditions favorable to humankind.

The solution must begin with the recognition that Earth is finite and neither human population nor the amount of Earth's resources per capita can further increase substantially. The inescapable conclusion is that, to achieve both social and environmental justice, more equity and fairness must be present in Earth's resources used per capita globally. The next ethical decision is whether humankind wishes an optimum quality of life (somewhat more resources per capita) or a mere survival quality of life (barely adequate resources per capita). If quality of life is measured by such criteria as literacy, longevity, low infant mortality, and large social capital (i.e. benign social interactions) and small to modest material goods acquisition per capita, then each individual and nation-state will have an ecological footprint size that is sustainable. In addition, natural capital and the ecosystem services it provides will be protected and cherished. This protection is the sine qua non of sustainable use of the planet.

Fierce resistance will come from individuals with a large ecological footprint size and the few individuals and organizations who get a disproportionate share of Earth's resources. Justice may be achieved by stabilizing the population size of nation-states by enforcing zero net immigration (e.g. Cairns, in press) and limiting family size and resource allocation. The alternative is to let natural law determine both population size and resource allocation. This situation is even less attractive than the one just described.

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