

# The sustainability transition: a new challenge

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As several of the papers in this special issue show, environmental health hazards are currently most prevalent in developing countries at the household level. Among the commonest hazards are indoor air pollution, arsenic and infectious agents in drinking-water, and local environmental exposure to lead. Finding ways to reduce these risks more quickly remains an important item on the global agenda because of the significant burden of disease they impose.

At the United Nations Conference on the Human Environment in 1972, much of the concern was about chemical contaminants, the depletion of natural resources, and urbanization. This reflected problems resulting from rapid industrialization in the West and the Soviet bloc countries, as well as uncontrolled agricultural and industrial expansion in the newly independent developing countries. Earlier there had been serious episodes of air pollution, such as the London fog of 1952, organic mercury poisoning in Minamata, Japan (disclosed in 1956), accumulations of heavy metals (especially lead and cadmium), pesticide toxicity, and exposures to environmental ionizing radiation. Similar toxicological hazards persist today. Since 1972, we have had the major accidents of Bhopal, Seveso and Chernobyl, and it is highly probable that there will be more.

Meanwhile, a further set of large-scale environmental problems has emerged and moved towards centre-stage. They add up to the conviction that we are living beyond the Earth's means, and that the continued increase in human numbers and economic activity poses a serious problem for the world as a whole. In September 1999 the United

Nations Environment Programme (UNEP) issued its *Global environment outlook 2000*, whose final chapter begins as follows.

“The beginning of a new millennium finds the planet Earth poised between two conflicting trends. A wasteful and invasive consumer society, coupled with continued population growth, is threatening to destroy the resources on which human life is based. At the same time, society is locked in a struggle against time to reverse these trends and introduce sustainable practices that will ensure the welfare of future generations.” (1)

The report urges all national governments to recognize the urgent need for concerted and radical action in order to make the transition to a sustainable system.

Some of the health implications of living in a destabilized global ecosystem are reviewed in this issue. They include the impact of climate change on vector-borne diseases (Githeko et al., pp. 1136–1147), the health effects of El Niño (Kovats, pp. 1127–1135), and the challenge of protecting health in a time of rapid change (Woodward et al., pp. 1148–1155).

The sustainability transition involves ensuring that the natural ecological, geophysical and chemical systems that support life on Earth can continue to function. The aim here is for those alive today to meet their own needs without making it impossible for future generations to meet theirs. To do this we have to bequeath to them a biosphere that is intact. This in turn calls for an economic structure within which we consume only as much as the natural environment can produce, and make only as much waste as it can absorb.

The three determinants of human disruption of the environment are population size, levels of material production and consumption, and types of technology (2). During the 20th century, carbon dioxide emissions increased almost fourfold. Climatologists think that for the concentration

of carbon dioxide to be tolerable for most ecosystems, emissions need to be reduced to about two thirds of their current level. Much of the technology needed to reduce carbon dioxide emissions without forfeiting our material standards of living already exists. The real challenge is political: to adopt the technologies and the practices that will ensure sustainability.

Overall, then, the threat to the environment and to human health comes not so much from increasing human numbers as from increasing use of environmentally damaging technologies (3). Major problems would arise in an unmanaged “development” transition that generalized to all countries the patterns of production and consumption typical of today's rich countries. By attempting to run the planet at full-speed-ahead, with current technologies and an expanding consumer demand, we are putting too much pressure on Earth's biophysical systems.

The sustainability transition cannot be expected to occur on its own or as the inevitable outcome of current trends. It will only occur if we make it happen, and do so in the near future. This is a task for the international community, as it feels its way towards more effective forms of global decision-making. One of the strongest sources of motivation for making the transition will be a clear understanding of the risks to human health posed by our overloading of the biosphere. The closing years of the 20th century put us clearly on notice that we must work together to get onto a path of ecologically sustainable social and economic development. The level of health attained by the world's population will be the ultimate criterion of how well we succeed. ■

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2. **Ehrlich PR, Holdren JP.** Impact of population growth. *Science*, 1971, **171**: 1212–1217.
3. **McMichael AJ, Powles JWP.** Human numbers, environment, sustainability and health. *British Medical Journal*, 1999, **319**: 977–980.

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