

The consumption bomb

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The explosion of the population bomb has long been predicted to cause massive famine in overpopulated countries. Rising consumption, even in a time of decreasing population growth rates, now threatens adverse global health effects more severe than localised famines. The world faces potential ecological entrapment. This has two dimensions: planetary eco-impoverisation and planetary eco-pathology. Eco-impoverisation, the depletion of natural capital, arises as the limit of the global human carrying capacity approaches. Eco-pathology, the disruption of ecological support systems, arises because of the way the biosphere has been modified by human activity and is caused particularly by unsustainable consumption for human purposes. Despite encroaching ecological entrapment, the dominant economic paradigm claims record levels of growth; a paradox that needs recognition. Reasons for denial of the gravity of ecological entrapment are discussed. Ways are suggested to defuse the consumption bomb and avert ecological entrapment.

Introduction

Chen said: "Dr Seldon, you disturb the peace of the Emperor's realm. None of the quadrillions living now among the all the stars in the Galaxy will be living a century from now. Why, then, should we concern ourselves with events of five centuries hence?"¹

The book *The Population Bomb*² was one of many attempts to stimulate concern about the rapidly increasing human population. Many such efforts have been criticised, by some, as doomsaying, yet in so doing, discount the beneficial impact of such warnings on policy.

Extreme predictions of global famine in association with population increase have not come about, but there is no evidence to justify complacency. A lower percentage but an absolute

greater number of people live in poverty and ill health than ever before.³⁻⁵ Accurate figures are difficult to obtain, due to the poor infrastructure in some countries and also pressure from superiors to report favourable statistics.⁶ Two recent articles by noted demographers⁷⁻⁸ suggest that there is no crisis, and a recent report suggests global population will peak at below 11 billion.⁹ The perception of whether there is a crisis is likely to be influenced by one's perspective, including one anthropogenicity. Displacement of minority and less sophisticated populations is well documented in countries including Bangladesh and Vietnam. In some cases, relatively sparsely populated regions are having their entire ethnic identity changed, against the wishes of the host population, by resettlement. Recent examples include West Papua (by Indonesia) and Tibet (by China), past examples include the colonization of North America and Australia by Europeans. Pressures partly caused by competition for resources remains a potent source of conflict, from the China Sea to the Persian Gulf.

Nevertheless, public health in the developed and population-stable North is not obviously threatened by the continuing expansion of the human population, *per se*, in the South. Complacency is fostered by the perception that the economic and military power of the North will limit any flow of refugees from the South to a manageable number.

In contrast, the adoption of ecologically harmful patterns of consumption by unprecedented numbers of people, living largely in the South, directly threatens ecological and human health in the North¹⁰⁻¹¹ and ultimately security.¹² This is the consumption bomb.

Demographic entrapment

King and others argue that impoverished countries, including Rwanda,¹³ other parts of sub-Saharan Africa and parts of the Indian subcontinent exhibit demographic entrapment.¹⁴⁻¹⁶ This has been defined as a human population with three elements: (a) one that has exceeded or is projected to exceed its local carrying capacity; (b) one that is unable to obtain, except as aid, needed goods and services, especially food; and (c) one that is unable to voluntarily migrate to an ecosystem which is not similarly demographically entrapped.¹⁶

It is possible that global demographic entrapment will occur if global carrying capacity is exceeded. It is more likely that demographic entrapment will be contained to the worst affected areas, which will be kept largely isolated and given a

little aid. As the population of the entrapped region falls spare capacity for local carrying capacity will re-emerge. Such events are unlikely to threaten global security unless the entrapped country is militarily powerful.

Ecological entrapment

“Entrapment” indicates the point where solutions become impossible to find or prohibitively expensive to attain, so the process becomes irreversible. Ecological entrapment is the point where damage to the natural world becomes irreversible on a scale which threatens human civilisation. I define ecological entrapment having two main dimensions; eco-impoverisation and eco-pathology.

Eco-impoverisation refers to the depletion of ecological resources, particularly of natural capital. These include water aquifers, biologically healthy rivers, forests, mangrove estuaries needed for fish breeding, wild fish and animal populations, topsoil, unpolluted air, the intact ozone layer, oil and natural gas reserves and areas of pristine habitat rich in biodiversity. The process of eco-impoverisation is accelerating as the biosphere is commandeered directly for human purposes, including for the production of food, fibre and fuel.

Substantial eco-impoverisation has already occurred, and is likely to worsen as the world tries to support the estimated four billion additional people who will be alive by 2050, particularly as many will have increasing aspirations and capability for consumption.

Eco-pathology refers to the disruption of ecological systems on a scale which threatens human survival. Eco-pathology has been substantially caused by unsustainable consumption, industrialisation and energy use, mainly in the developed North.¹⁰⁻¹¹ Combustion of the finite supply of fossil fuels adversely affects the composition of the atmosphere, risks oil spills and contributes directly to particulate air pollution and acid rain. Reliance on nuclear fuels risks further Chernobyl-like catastrophes, contributes to maintaining the risk of nuclear war and increases the quantity of long-lived radio-active isotopes yet to be stored safely. Damage to the stratospheric ozone layer may lead to increased rates of cataract, skin cancer and immunological damage.¹⁷ Post-Montreal Protocol complacency that this problem at least has been solved may be misplaced. A black market exists in ozone damaging CFCs and unmet demand for refrigeration in the South outstrips the installed capacity of the North.

Global environmental change is also increasingly recognised as having far-reaching implications to human health.¹⁸⁻¹⁹ Global warming is

likely to lead to increased transmission of vector-borne viral, protozoal and other parasitic disease.¹⁸⁻²¹ This illustrates one consequence of eco-pathology.

The biosphere is a complex and, technically, a non-linear or chaotic system. By its interactions, many of which are incompletely understood or unknown, homeostasis is maintained. Human activity is reducing the biosphere's complexity, particularly by the reduction of biodiversity. The risk of damage to planetary homeostasis is added to by eco-pathology.

Consumption in the South

Unprecedented numbers of people living in east and south Asia are now developing standards of living formerly restricted to the North. As disposable income in the South rises, the global rate of unsustainable consumption of forests, fish stocks, water aquifers and topsoils for human use is increasing. The aspiration for increased living standards in the South is understandable, but its realisation by conventional unsustainable harvesting of natural capital and the consequent increased fossil fuel use threatens accelerated ecological entrapment. Rees calculates that if the present world population of 6 billion people were to live at current North American ecological standards an additional two planet Earths would be needed.²²⁻²³ Consumers, corporations and governments of the North cannot, however, expect reforms in the pattern of consumption to arise in the South without providing economic and other incentives, including substantial reduction of their own ecological footprint.²⁴

The future of food supply

Recent estimates of the maximum human population the earth can feed vary widely, from the current population to a trillion or more, depending on different assumptions.²⁵⁻²⁷ However, consistent among the optimistic predictions of food supply is the failure to predict or explain the fall in *per caput* production of grain in the last few years.^{15, 28-29} It remains to be seen if this fall is temporary.

As China's *per caput* income rises its citizens' demand for meat is almost certain to increase. Using conventional agricultural means it is difficult to imagine how China can significantly increase its *per caput* meat intake from domestic production in the next 50 years, a period when its population is estimated to increase by at least 400 million to a peak of around 1.5 billion,³⁰ without relying on substantial grain imports.

Increasing China's share of the global fish harvest seems only possible at the expense of other nations' shares, as the annual fish catch appears to have plateaued at about 100 million tonnes.³¹ Poultry

is the most efficient means of converting grain to meat, at a ratio of approximately 2:1. Unable to either grow sufficient plant protein domestically, or to harvest a sufficient amount from the sea, the Chinese may be able to afford to import grain from North America or Australia to convert to meat. Whether the grain exporting regions are able to increase their supply sufficiently to meet this demand is uncertain.³² This scenario of increasing demand for animal, fish and bird protein is likely to be repeated in other parts of south and east Asia, though at a much slower pace among the Hindu population.

Loss of productive agricultural land by drought, flooding, erosion, urbanisation, salinisation, landmines³³ and sea level rise may in theory be compensated for by technology ranging from better fertilisers and irrigation techniques to sea walls and even synthetic food production relying on tissue culture and artificial light.²⁵ Most of these solutions require significant capital investment and it is unlikely that the most vulnerable parts of the population will be able to afford these solutions.

The effect of climate change on food production is difficult to predict,³⁴ but if weather patterns become more unstable harvests may also be less certain. The seasonality of rainfall may be as important as the total quantity. The current famine in North Korea has been blamed in part on unseasonal rain during the harvest in consecutive years, perhaps an effect of climate change.

Optimistic assessments of global food production also discount the possibility of discontinuities.³⁵ These are dramatic events, unpredictable if data is simply extrapolated. There are many biological and sociological examples of such discontinuities, threshold events which occur close to limits. In the current chaos of the densely populated Great Lakes area of central Africa, how much attention is being given to agriculture? Discontinuities may be more likely to occur in association with the limit of the Earth's carrying capacity for human beings.

Much of the world's land remains uncultivated land because of a lack of surface water.³⁶ Using underground aquifers may provide a short-term solution, but eventually is likely to be limited by exhaustion of the water and problems from the subsidence of the overlying ground. However, sufficient land and underground water exist in theory to feed millions more people for the next century at least.²⁵ It is by no means certain, though, in the context of the rapidly increasing population, a widening gap between rich and poor in both North and South, a political shift towards individual rather than collective responsibility and the concentration of increasing resources in the hands of fewer institutions, many of them corporations, that this is

possible. There is not much time to find out.

The economics of destruction

As habitats, species and cultures increasingly become contaminated or extinct, economic indicators sound little alarm. Indeed, the search for "economic" as opposed to other forms of growth has arguably played a key role in promoting both eco-improvement and eco-pathology.¹¹

Neoclassical economics gives no incentives for sustainable consumption other than the market. Yet the market cannot restock fisheries or restore topsoil. Contamination to land, groundwater and air has occurred in concert with an economic system that discounts the future and which until recently has treated natural capital as a free and limitless good. The environmental, health, social and ecological costs we and our children face are not discounted "externalities" but may indicate what Daly calls the Plimsoll line³⁷ that separates a sustainable future from global disaster.

Reality gap

In the North there is widespread knowledge of both poor health conditions and of rapid population increase in the South. There is increasing understanding of the ecological risks incurred by our lifestyle of consumption and there is a rapidly increasing volume of literature about these issues. Yet, discussion of these issues remains only peripheral to mainstream science, medicine, economics and society.

To what extent are the dominant scientific, public health and economic concerns determined by funding?³⁸ It is in no-one's long-term interest to deny the risk of ecological entrapment, yet such denial is commonplace. This reality gap allows ignorance of what has been called a form of totalitarianism³⁹ against the environment. Denial also includes of the extent of suffering of human populations in the South. King and his colleagues suggest that too close a look at these issues means risking breaking a taboo integral in the maintenance of cultural stability.¹⁵ For long term cultural and ecological stability, the cant, denial, obfuscation and taboos which block recognition of these matters must be removed.⁴⁰

Is the undervaluation of the deaths of foreign and impoverished people a form of nationalism and racism? Are some governments in the South more concerned with maintaining political power and national prestige than improving the health of their own people?

Why do the media frequently sensationalise or trivialise environmental and public health concerns, while at the same time feeding their

consumers a daily diet of sober but misleading conventional economic data, theory and prognostications? The release of recent World Health Organization publications regarding the seriousness of the health risks of climate change was largely ignored by the British press.⁴¹

Is there an agenda by wealthy interests in the North to keep the South - and increasingly, parts of the North - impoverished, a pool of cheap labour and resources, and a sink for Northern pollution, such as toxic waste?

Technological rescue?

Biotechnological solutions to increase food supply, such as improved strains of rice, may buy a little more time before intolerable strains are placed on global grain supplies.⁴² But those who claim a bio-technological revolution alone will save all of us need to account for events such as the demise of the North Atlantic fish harvest. However, even if technology alone cannot rescue us, it remains an essential component in any politically acceptable sustainable future. Rapid and voluntary reduction of consumption levels in the North seems possible only with massive technological change which allows similar or improved living standards. Halting the South's consumption at present levels, without invoking massive destruction such as by war, appears unrealistic and ethically reprehensible. Yet the combined ecological footprint of individuals in the North and South must shrink if ecological entrapment is to be averted.

The necessary technological transition has started but needs economies of scale and more economic incentives to fairly compete with the existing ecologically unsustainable, often subsidised technologies. The use of raw materials, such as metal and coal, has become more efficient for each unit of production or energy. The economist, Simon, has claimed that the falling real price of many raw materials, despite rapid industrialisation and population growth, is evidence that no global crisis is likely.⁴³ This may be true for some recyclable and substitutable raw materials.

The increasing capacity of the telecommunication system, allied with computerisation, is reducing the need for transport and paper and a revolution in energy production and consumption is underway.⁴⁴ Better building and urban design, insulation, more efficient appliances, increased recycling and the resurgence of public transport and bicycles can help build an ecologically sustainable future. Computer controlled drip irrigation may eke out water supplies and at the same time reduce soil salinisation; replanting of forests may help stabilise climate.

Energy distribution in the South is inefficient⁴⁵ and often wasteful. The local production of energy from

renewable sources including solar, biogas,⁴⁶ wind and water has enormous potential to reduce greenhouse emissions, as does better design of buildings and cities by reducing energy demand.

Defusing the consumption bomb

In the North the ecological footprint can be decreased by widespread conversion to environmentally sustainable technologies and by economic incentives to reduce waste and environmental damage. In the South the footprint may be reduced by switching to these same technologies and simultaneously reducing population increase. Success hinges on the rapid diffusion of technologies which can create high living standards with low environmental impact. A one-child society - especially in the North - may be desirable^{15,29} but more importantly each additional child in the North needs to leave a smaller ecological footprint.²³

Changes in our attitude to consumption and to the environment are needed at a global level, and leadership must emanate from the wealthy countries. There is a risk that as *per-capita* disposable income in these countries, particularly the United States, continues to fall there will be less political pressure to act with global ecological responsibility, and to invest in environmentally friendly technologies. This could lead to an irreversible spiral.

The proper accounting of economic externalities, including the dissemination of indices of national and global ecological social and human well being^{11,47} will help create fundamental incentives for sustainable technologies.

US Vice-President Al Gore has called for a technology conversion plan for the South on the scale of a new Marshall Plan.¹² Increased media coverage by the North of the South, and use of technologies from the information superhighway to hand driven spring radios will help reduce the gap between North and South and disseminate new technology and awareness. It may also facilitate demographic disentanglement.

On the other hand, the US has become the meanest member of the Organization for Economic Cooperation and Development donor community, with its *per caput* family planning aid falling to the equivalent to the cost of a hamburger with cheese for 1996-97.⁴⁸

The health professions were pivotal in slowing the ticking of the atomic clock. Arguably, the threat of nuclear war has receded in part because the general population in the North eventually perceived this was in their self-interest. The health professions can again lead public debate concerning these issues.⁴⁹⁻⁵⁰

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