

By invitation

The truth about the environment

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Panos

Environmentalists tend to believe that, ecologically speaking, things are getting worse and worse. Bjorn Lomborg, once deep green himself, argues that they are wrong in almost every particular

ECOLOGY and economics should push in the same direction. After all, the “eco” part of each word derives from the Greek word for “home”, and the protagonists of both claim to have humanity's welfare as their goal. Yet environmentalists and economists are often at loggerheads. For economists, the world seems to be getting better. For many environmentalists, it seems to be getting worse.

These environmentalists, led by such veterans as Paul Ehrlich of Stanford University, and Lester Brown of the Worldwatch Institute, have developed a sort of “litany” of four big environmental fears:

- Natural resources are running out.
- The population is ever growing, leaving less and less to eat.
- Species are becoming extinct in vast numbers: forests are disappearing and fish stocks are collapsing.
- The planet's air and water are becoming ever more polluted.

Human activity is thus defiling the earth, and humanity may end up killing itself in the process.

The trouble is, the evidence does not back up this litany. First, energy and other natural resources have become more abundant, not less so since the Club of Rome published “The Limits to Growth” in 1972. Second, more food is now produced per head of the world's population than at any time in history. Fewer people are starving. Third, although species are indeed becoming extinct, only about 0.7% of them are expected to disappear in the next 50 years, not 25-50%, as has so often been predicted. And finally, most forms of environmental pollution either appear to have been exaggerated, or are transient—associated with the early phases of industrialisation and therefore best cured not by restricting economic growth, but by accelerating it. One

The “litany” of environmental fears is not backed up by evidence

form of pollution—the release of greenhouse gases that causes global warming—does appear to be a long-term phenomenon, but its total impact is unlikely to pose a devastating problem for the future of humanity. A bigger problem may well turn out to be an inappropriate response to it.

Can things only get better?

Take these four points one by one. First, **the exhaustion of natural resources**. The early environmental movement worried that the mineral resources on which modern industry depends would run out. Clearly, there must be some limit to the amount of fossil fuels and metal ores that can be extracted from the earth: the planet, after all, has a finite mass. But that limit is far greater than many environmentalists would have people believe.

Reserves of natural resources have to be located, a process that costs money. That, not natural scarcity, is the main limit on their availability. However, known reserves of all fossil fuels, and of most commercially important metals, are now larger than they were when “The Limits to Growth” was published. In the case of oil, for example, reserves that could be extracted at reasonably competitive prices would keep the world economy running for about 150 years at present consumption rates. Add to that the fact that the price of solar energy has fallen by half in every decade for the past 30 years, and appears likely to continue to do so into the future, and energy shortages do not look like a serious threat either to the economy or to the environment.

The development for non-fuel resources has been similar. Cement, aluminium, iron, copper, gold, nitrogen and zinc account for more than 75% of global expenditure on raw materials. Despite an increase in consumption of these materials of between two- and ten-fold over the past 50 years, the number of years of available reserves has actually grown. Moreover, the increasing abundance is reflected in an ever-decreasing price: *The Economist's* index of prices of industrial raw materials has dropped some 80% in inflation-adjusted terms since 1845.

Next, **the population explosion** is also turning out to be a bugaboo. In 1968, Dr Ehrlich predicted in his best selling book, “The Population Bomb”, that “the battle to feed humanity is over. In the course of the 1970s the world will experience starvation of tragic proportions—hundreds of millions of people will starve to death.”

That did not happen. Instead, according to the United Nations, agricultural production in the developing world has increased by 52% per person since 1961. The daily food intake in poor countries has increased from 1,932 calories, barely enough for survival, in 1961 to 2,650 calories in 1998, and is expected to rise to 3,020 by 2030. Likewise, the proportion of people in developing countries who are starving has dropped from 45% in 1949 to 18% today, and is expected to decline even further to 12% in 2010 and just 6% in 2030. Food, in other words, is becoming not scarcer but ever more abundant. This is reflected in its price. Since 1800 food prices have decreased by more than 90%, and in 2000, according to the World Bank, prices were lower than ever before.

Modern Malthus

Dr Ehrlich's prediction echoed that made 170 years earlier by Thomas Malthus. Malthus claimed that, if unchecked, human population would expand exponentially, while food production could increase only linearly, by bringing new land into cultivation. He was wrong. Population growth has turned out to have an internal check: as people grow richer and healthier, they have smaller families. Indeed, the growth rate of the human population reached its peak, of more than 2% a year, in the early 1960s. The rate of increase has been declining ever since. It is now 1.26%, and is expected to fall to 0.46% in 2050. The United Nations estimates that most of the world's population growth will be over by 2100, with the population stabilising at just below 11 billion (see chart 1).

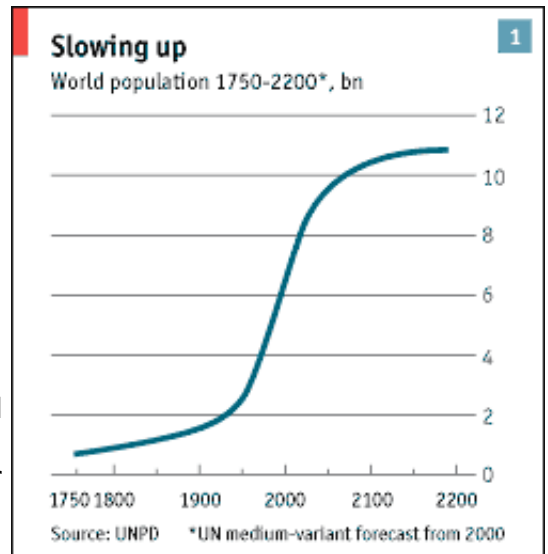
Malthus was wrong: population growth has not been exponential

Malthus also failed to take account of developments in agricultural technology. These have squeezed more and more food out of each hectare of land. It is this application of human ingenuity that has boosted food production, not merely in line with, but ahead of, population growth. It has also, incidentally, reduced the need to take new land into cultivation, thus reducing the pressure on biodiversity.

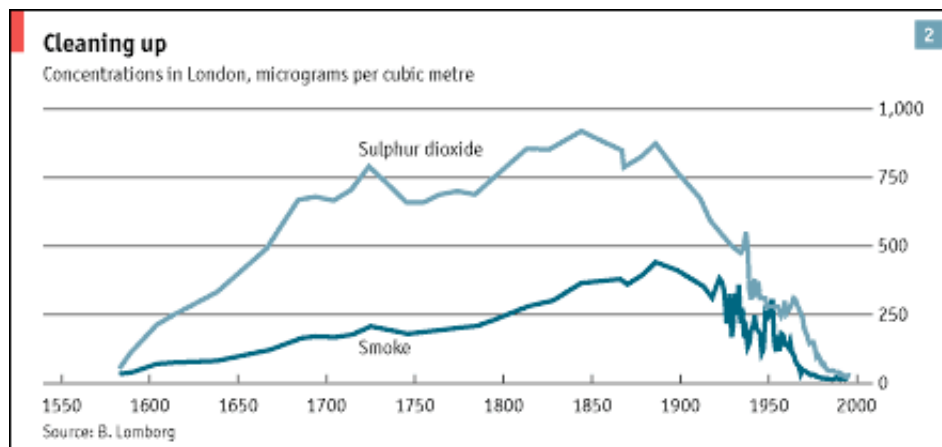
Third, that **threat of biodiversity loss** is real, but exaggerated. Most early estimates used simple island models that linked a loss in habitat with a loss of biodiversity. A rule-of-thumb indicated that loss of 90% of forest meant a 50% loss of species. As rainforests seemed to be cut at alarming rates, estimates of annual species loss of 20,000-100,000 abounded. Many people expected the number of species to fall by half globally within a generation or two.

However, the data simply does not bear out these predictions. In the eastern United States, forests were reduced over two centuries to fragments totalling just 1-2% of their original area, yet this resulted in the extinction of only one forest bird. In Puerto Rico, the primary forest area has been reduced over the past 400 years by 99%, yet "only" seven of 60 species of bird has become extinct. All but 12% of the Brazilian Atlantic rainforest was cleared in the 19th century, leaving only scattered fragments. According to the rule-of-thumb, half of all its species should have become extinct. Yet, when the World Conservation Union and the Brazilian Society of Zoology analysed all 291 known Atlantic forest animals, none could be declared extinct. Species, therefore, seem more resilient than expected. And tropical forests are not lost at annual rates of 2-4%, as many environmentalists have claimed: the latest UN figures indicate a loss of less than 0.5%.

Fourth, **pollution** is also exaggerated. Many analyses show that air pollution diminishes when a society becomes rich enough to be able to afford to be concerned about the environment. For London, the city for which the best data are available, air pollution peaked around 1890 (see chart 2). Today, the air is cleaner than it has been since 1585. There is good reason to believe that this general picture holds true for all developed countries. And, although air pollution is increasing in many developing countries, they are merely replicating the development of the industrialised countries. When they grow sufficiently rich they, too, will start to reduce their air pollution.



In London, air pollution peaked around 1890



All this contradicts the litany. Yet opinion polls suggest that many people, in the rich world, at least, nurture the belief that environmental standards are declining. Four factors cause this disjunction between perception and reality.

Always look on the dark side of life

One is the lopsidedness built into scientific research. Scientific funding goes mainly to areas with many problems. That may be wise policy, but it will also create an impression that many more potential problems exist than is the case.

Secondly, environmental groups need to be noticed by the mass media. They also need to keep the money rolling in. Understandably, perhaps, they sometimes exaggerate. In 1997, for example, the Worldwide Fund for Nature issued a press release entitled, "Two-thirds of the world's forests lost forever". The truth turns out to be nearer 20%.

Though these groups are run overwhelmingly by selfless folk, they nevertheless share many of the characteristics of other lobby groups. That would matter less if people applied the same degree of scepticism to environmental lobbying as they do to lobby groups in other fields. A trade organisation arguing for, say, weaker pollution controls is instantly seen as self-interested. Yet a green organisation opposing such a weakening is seen as altruistic, even if a dispassionate view of the controls in question might suggest they are doing more harm than good.

Environmental groups are much like other lobby groups, but are treated less sceptically

A third source of confusion is the attitude of the media. People are clearly more curious about bad news than good. Newspapers and broadcasters are there to provide what the public wants. That, however, can lead to significant distortions of perception. An example was America's encounter with El Niño in 1997 and 1998. This climatic phenomenon was accused of wrecking tourism, causing allergies, melting the ski-slopes and causing 22 deaths by dumping snow in Ohio.

A more balanced view comes from a recent article in the *Bulletin of the American Meteorological Society*. This tries to count up both the problems and the benefits of the 1997-98 Niño. The damage it did was estimated at \$4 billion. However, the benefits amounted to some \$19 billion. These came from higher winter temperatures (which saved an estimated 850 lives, reduced heating costs and diminished spring floods caused by meltwaters), and from the well-documented connection between past Niños and fewer Atlantic hurricanes. In 1998, America experienced no big Atlantic hurricanes and thus avoided huge losses. These benefits were not reported as widely as the losses.

The fourth factor is poor individual perception. People worry that the endless rise in the amount of stuff everyone throws away will cause the world to run out of places to dispose of waste. Yet, even if America's trash output continues to rise as it has done in the past, and even if the American population doubles by 2100, all the rubbish America produces through the entire 21st century will still take up only the area of a square, each of whose sides measures 28km (18 miles). That is just one-12,000th of the area of the entire United States.

The price of a life

Cost of saving one year of one person's life
1993\$

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| Passing laws to make seat-belt use mandatory | 69 |
| Sickle-cell anaemia screening for black new-borns | 240 |
| Mammography for women aged 50 | 810 |
| Pneumonia vaccination for people aged over 65 | 2,000 |
| Giving advice on stopping smoking to people who smoke more than one packet a day | 9,800 |
| Putting men aged 30 on a low-cholesterol diet | 19,000 |
| Regular leisure-time physical activity, such as jogging for men aged 35 | 38,000 |
| Making pedestrians and cyclists more visible | 73,000 |
| Installing air-bags (rather than manual lap belts) in cars | 120,000 |

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| Installing arsenic emission-control at glass-manufacturing plants | 51,000,000 |
| Setting radiation emission standards for nuclear-power plants | 180,000,000 |
| Installing benzene emission control at rubber-tyre manufacturing plants | 20,000,000,000 |

Source: T. Tengs et al, *Risk Analysis*, June 1995

Ignorance matters only when it leads to faulty judgments. But fear of largely imaginary environmental problems can divert political energy from dealing with real ones. The table above, showing the cost in the United States of various measures to save a year of a person's life, illustrates the danger. Some environmental policies, such as reducing lead in petrol and sulphur-dioxide emissions from fuel oil, are very cost-effective. But many of these are already in place. Most environmental measures are less cost-effective than interventions aimed at improving safety (such as installing air-bags in cars) and those involving medical screening and vaccination. Some are absurdly expensive.

Yet a false perception of risk may be about to lead to errors more expensive even than controlling the emission of benzene at tyre plants. Carbon-dioxide emissions are causing the planet to warm. The best estimates are that the temperature will rise by some 2°-3°C in this century, causing considerable problems, almost exclusively in the developing world, at a total cost of \$5,000 billion. Getting rid of global warming would thus seem to be a good idea. The question is whether the cure will actually be more costly than the ailment.

Despite the intuition that something drastic needs to be done about such a costly problem, economic analyses clearly show that it will be far more expensive to cut carbon-dioxide emissions radically than to pay the costs of adaptation to the increased temperatures. The effect of the Kyoto Protocol on the climate would be minuscule, even if it were implemented in full. A model by Tom Wigley, one of the main authors of the reports of the UN Climate Change Panel, shows how an expected temperature increase of 2.1°C in 2100 would be diminished by the treaty to an increase of 1.9°C instead. Or, to put it another way, the temperature increase that the planet would have experienced in 2094 would be postponed to 2100.

Radically cutting carbon-dioxide emissions will be far more expensive than adapting to higher temperatures

So the Kyoto agreement does not prevent global warming, but merely buys the world six years. Yet, the cost of Kyoto, for the United States alone, will be higher than the cost of solving the world's single most pressing health problem: providing universal access to clean drinking water and sanitation. Such measures would avoid 2m deaths every year, and prevent half a billion people from becoming seriously ill.

The Kyoto agreement merely buys the world six years

And that is the best case. If the treaty were implemented inefficiently, the cost of Kyoto could approach \$1 trillion, or more than five times the cost of worldwide water and sanitation coverage. For comparison, the total global-aid budget today is about \$50 billion a year.

To replace the litany with facts is crucial if people want to make the best possible decisions for the future. Of course, rational environmental management and environmental investment are good ideas—but the costs and benefits of such investments should be compared to those of similar investments in all the other important areas of human endeavour. It may be costly to be overly optimistic—but more costly still to be too pessimistic.

Bjorn Lomborg is a statistician at the University of Aarhus, Denmark, who once held what he calls "left-wing Greenpeace views". In 1997, he set out to challenge Julian Simon, an economist who doubted environmentalist claims—and found that the data generally supported Simon. His book, "The Skeptical Environmentalist", will be published in English by Cambridge University Press in a month's time.