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Economists cannot keep pretending that Earth's resources are infinite, says ecological economist **Herman Daly**. If we cannot find a way to switch to a sustainable economy, we are heading for the ultimate crash

On a road to disaster

THERE is a salutary tale about the World Bank. The first draft of its 1992 World Development Report, dedicated to sustainable development, contained a diagram labelled "the relation of the economy to the environment". It showed a rectangle labelled "economy", with an arrow entering it labelled "inputs" and an arrow exiting it labelled "outputs". That was it.

It was my job, as senior economist in the bank's environment department, to review the draft and offer suggestions. I said drawing such a picture was a great idea, but it really had to include the environment. As drawn, the economy was receiving inputs from nowhere and expelling outputs back to nowhere.

I suggested we draw a big circle around the economy and label it "ecosystem". Then it would be clear that the inputs represented resources taken from the ecosystem, and the outputs represented waste returned to it as pollution. This would allow us to raise fundamental questions, such as how big the economy can get before it overwhelms the total system.

When the second draft came back, a large unlabelled rectangle had been drawn around the original figure, like a picture frame. I complained that it changed nothing. In the third draft, the diagram was gone. The idea that economic growth should be constrained by the environment was too much for the World Bank in 1992, and still is today. The bank recognised that something must be wrong with that diagram – but better to omit it than deal with the inconvenient questions it raised.

That was when I realised that economists have not grasped a simple fact that to scientists is obvious: the size of the Earth as a whole is fixed. Neither the surface nor the mass of the planet is growing or shrinking. The same is true for energy budgets: the amount absorbed by the Earth is equal to the amount it radiates. The overall size of the system – the amount of water, land, air, minerals and other resources present on the planet we live on – is fixed.

The most important change on Earth in recent times has been the enormous growth of the economy, which has taken over an ever greater share of the planet's resources. In my lifetime, world population has tripled, while the numbers of livestock, cars, houses and refrigerators have increased by vastly more. In fact, our economy is now reaching the point where it is outstripping Earth's ability to sustain it. Resources are running out and waste sinks are becoming full. The remaining natural world can no longer support the existing economy, much less one that continues to expand.

The economy is like a hungry, growing organism. It consumes natural resources such as trees, fish and coal, produces energy and useful goods from them, and spits out waste such as carbon dioxide, mine slag and dirty water. Mainstream economists are mostly concerned with the organism's circulatory system, how the energy and resources can be efficiently allocated, while tending to ignore its digestive system. As my experience with the diagram showed, the sources of the resources that the organism consumes and the sinks into which it deposits waste are ignored. Effectively, economists are assuming they are infinite.

Because of this, they recognise no limits on the capacity for economic growth. In a report published earlier this year, the Commission on Growth and Development reviewed the experience and policies of 13 countries, including Botswana, Brazil, China and Japan, which since the 1950s have grown at an average annual rate of 7 per cent or more for 25 years or longer. The commission suggests that this is an example the rest of the world should follow. If the global economy were to grow this fast, however, then in 25 years it would have increased to five times its present size. They don't say what would happen after that; presumably we should simply aim to do the same again.

Generally, when the cost of an activity starts to outweigh any benefits, we stop doing it. Buying one ice cream makes sense if it brings us pleasure and satisfies our hunger. Once we have eaten two or three, however, we do not buy more because, despite the pleasant taste, we start feeling sick. This "off switch" is not working for the economy as a whole, though, because our national accounts do not separate the costs of economic activity from the benefits. Instead, both are counted towards a country's GDP. We count as desirable growth both the beneficial activity that causes pollution and the costly activity of cleaning up the pollution, for example. And when cutting down trees and selling the lumber boosts GDP, we subtract nothing for the loss of forests.

The scale of the global economy is approaching the limits of what our planet can cope with. As the oceans are emptied of fish, forests shrink from logging and levels of pollutants and greenhouse gases in the atmosphere rise, the environmental and social costs of further growth are likely to intensify until we reach a point at which the price we pay for each unit of extra growth becomes greater than the benefits we gain.

In fact, there is evidence that we have passed this point, at least in well-off countries such as the US and UK. Since our GDP accounts cannot reveal whether this has happened or not, scholars have devised ways to track other potential indicators such as health, well-being and the state of our environment. These include the Index of Sustainable Economic Welfare, the Genuine Progress Indicator, the Ecological Footprint, and the Happy Planet Index. They have found that as GDP goes up, these other measures are levelling off and even declining. Economic growth may already be making us poorer rather than richer.

As long as our economic system is based on chasing economic growth above all else, we are heading for environmental, and economic, disaster. To avoid this fate, we must switch our focus from quantitative growth to qualitative development, and set strict limits on the rate at which we consume the Earth's resources. In such a "steady-state" economy, the value of goods produced can still increase, for example through technological innovation or better distribution, but the physical scale of our economy must be kept at a level the planet is able to sustain. Can we transform our economy from a forward-moving aeroplane to a hovering helicopter without crashing? After 200 years in a growth economy, it is hard to imagine what a steady-state economy might look like, but it does not have to mean freezing in the dark under a ommunist tyranny (see page xx). Most of the changes could be applied gradually, in mid-air.

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The idea of moving to a steady-state economy will appear radical to many, perhaps politically impossible. But the alternative, a macro-economy that is structurally required to grow in scale beyond the biophysical limits of the Earth, is an absurdity, and heading for the ultimate crash. Before we reach that radical physical limit, we are already encountering the economic limit at which benefits of extra growth are increasingly outweighed by the costs. ●

Profile

Herman Daly is one of the founders of the field of ecological economics, which argues that the scale of the economy must be kept within sustainable limits. He was senior economist in the World Bank's environment department from 1988 to 1994, and is now professor of ecological economics at the University of Maryland