

## Book review

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### *Limits to Growth: the 30-Year Update*

Donella Meadows, Jorgen Randers and Dennis Meadows

Chelsea Green, White River Junction, VT , 2004, 368 pp, \$35.00

In 1972, the original *Limits to Growth* study concluded that “if the present growth trends in world population, industrialization, pollution, food product, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next 100 years. The most probable result will be a rather sudden and uncontrolled decline in both population and industrial capacity.” Happily, we should expect that their second revision, *Limits to Growth: the 30-Year Update*, will reassure us that their original projections were far too pessimistic, and that all is and will continue to be well. They should own up to their gloom-and-doom tendencies and confess to their environmentalist ethic ideology blinding them to the wonders of the market. They should speak glowingly of the role of human ingenuity and technological progress.

They don't.

In fact, back in 1992, the author's first revision *Beyond the Limits*, which updated the original model and attempted to address the initial criticisms, concluded that humanity had already overshoot the limits of the Earth's support capacity. And now a dozen years later, they have once again scrupulously analyzed and adjusted the model to reflect the most recent critiques, and, once again the team -- minus co-author Donella Meadows who passed away in 2002 -- sticks by the substance of their original conclusions.

The original *Limits* publication in 1972 ignited a debate about growth that continues today. Environmentalists in particular rallied around the book and called for actions to forestall the limits. Critics accused the authors of gloom and doom and charged that the

global model upon which their conclusions were based failed to adequately account for human ingenuity in the form of technological capability.

The authors have repeatedly addressed and rejected the suggestion that technology will be the magic bullet that solves the growth challenge. Technology can help for sure, but “technology market responses are themselves delayed and imperfect. They take time, they demand capital, they require materials and energy flow....” “Even with the most effective technologies and the greatest economic resilience...if those are the only changes, the model tends to generate scenarios of collapse.” If you are one of those folks comforted by the role of technology, the authors do their best to make you uncomfortable.

They remain confident in their World3 model. The aggregated scenarios are surprisingly accurate after 30 years. The simulations, in nearly every scenario, overshoot and collapse the planet’s economy and population.

If we have surpassed limits, you might ask why things aren’t worse. You might even be surprised to know this is the case. Shouldn’t apocalypse be around the corner? We need to clarify what is meant by surpassing limits. For example, per capita grain production peaked in about 1985 and has been falling slowly since. We have read lots of stories about fisheries being over-fished to the point where they have nearly disappeared. Once a limit is overshoot, the correction either comes from a managed process or through nature. A positive example cited in the 2004 book is the ozone story, in which “we shot past a limit, observed the consequences, and then struggled successfully to bring human activity back down to sustainable levels.”

In each of the books, they have concluded that there is time left to address the limits, provided the citizenry and political leaders are willing to take the necessary steps. The “landings” vary in degrees of harshness in direct proportion to how soon we begin to take the necessary remedial measures. Their rough estimate is that perhaps we are 20% above the limit of sustainable carrying capacity. They warn that the window for taking these

necessary steps is progressively closing. As time passes, remedial action becomes more difficult to accomplish. They are “much more pessimistic about the global future than they were in 1992.”

To give an example of what overshoot means, they cite the dot.com bubble in the stock market that burst in March 2000. This was followed by shares falling in value for three years, before gradually recovering. Unfortunately, the bubble in global resource use and emissions will be on a much longer time scale. It will arrive very suddenly, and after it's been around for a while, it will seem obvious in hindsight that it was coming, and we will regret not taking the appropriate action.

The basic problem is that current rates of throughput generated by the global economy cannot be maintained at current levels much longer. The good news is that these high rates are not necessary to support a decent standard of living for all the world's people. They suggest that if the world responds with cleverness and wisdom, eight billion people can be supported at the level of lower-income nations of present-day Europe.

To address the two most common and simplistic criticisms of their works:

- The authors do not argue that the world is about to exhaust the planet's stocks of energy and raw material, i.e., they are not saying that we are going to physically run out of oil. Their concern, rather, “arises from the growing cost of exploiting the globe's sources and sinks.” They conclude that “the growth in the harvest of renewable resources, depletion of non-renewable materials, and the filling of the sinks are combining slowly and inexorably to raise the amount of energy and capital required to sustain the quantity and quality of material flows required by the economy.”
- They do not advocate no growth. In their own words, “the notion of zero growth is so primitive – as, for that matter, is that of infinite growth – and so imprecise, that it is conceptual nonsense to talk of it in a living, dynamic society.”

They suggest three ways to respond to signals that resource use and pollution emissions have grown beyond their sustainable limits:

- Deny, disguise, or confuse the signals
- Alleviate the pressures from limits by technical or economic fixes
- Work on the underlying causes and change the structure of the system

Certainly, futurists will find the third notion the most sensible, but at the same time it is by far the hardest of the three to accomplish. The easiest, of course, is the first.

The steps they suggest for addressing the situation are:

- Extend the planning horizon
- Improve the signals
- Speed up response times
- Minimize the use of non-renewable resources
- Prevent the erosion of renewable resources
- Use all resources with maximum efficiency
- Slow and eventually stop exponential growth of population and physical capital

Practically everyone would agree that these are sensible steps, but accomplishing them will require a degree of foresight not in great abundance today.

In sum, readers should find the tone of the book quite engaging. The authors are not preachy or hysterical, but rather quite calm and balanced. They convey a spirit of open-mindedness and are not at all defensive – which could be expected given the criticism they've endured these many years. They display a genuine concern for humanity blended with a seasoned analyst's view of what's possible. The work is nicely supported with data, charts, and graphs, and a supporting DVD is available for those who might want to use it in the classroom. If you're looking for a frothy polemic you'll be disappointed, but

if you're looking for a balanced, reasonable treatment of complex issues, you'll be well served by reading this book.

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