

## A critique of Beyond Six Billion

This excerpt critiques *Beyond Six Billion* (Bongaarts and Bulatao, eds., 2000; National Academy Press).

In his book *HOW MANY PEOPLE CAN EARTH SUPPORT* (1995) author Joel Cohen writes of *time* as a critical aspect of our population problem. Even if replacement-level fertility could be achieved instantly, there would still be a delay of many years before world population stops growing. Such delays and lag times, however, can result in responses that come too late, resulting in overshoot.

Judged by such standards, it seems certain that, from a global and natural science perspective, we are in a condition of overshoot right now. There is a delay between the time we empty CO<sub>2</sub> into the atmosphere and the time that its full climatic effects take place. There is a delay between the time that we empty chlorofluorocarbons into the atmosphere and the time when their atmospheric effects become apparent. Such delays are a problem, because, as Cohen points out, "Time is required to solve problems of energy, agriculture, minerals, biological diversity, disease, and infrastructure."

Our societies, traditions, political institutions, and social institutions are notoriously slow and unwieldy in their response to change. It is reckless to contemplate accommodating one additional billion and another and another in the breathlessly few years that pass between one assault and the next and the next.

And if we grow too fast, and fail to negotiate the curves and hazards in a careful, methodical, and cautious manner, we can find multiple hazards appearing suddenly and unexpectedly and confronting us too quickly for us to respond, as is happening now. When heedless speeding takes place on a winding mountain road, a vehicle and its passengers can overshoot their limits and fly off a cliff.

Biologists, climatologists, and natural scientists seem to recognize both the rapidity and the degree of the changes that we are generating, as well as the sensitivity of natural systems to our repeated and large-scale insults (e.g., IPCC, 2007; Hansen, 2006; Schellnhuber, 2005; Pimm, 2001; Press, et al., 1992; Campbell, Reece and Mitchell, 1999; Kendall, 1992, and Raven, 1987).

### **Beyond Six Billion**

Other writers, however, seem to be, at best, complacent. An example of this complacency can be seen in *BEYOND SIX BILLION* edited by John Bongaarts and Rodolfo Bulatao and published by the National Academy Press in 2000. If *BEYOND SIX BILLION* were written about the voyage of the passenger liner *Titanic*, it would be packed with data on the ship's past and future speeds, engine data, time at sea and distances that can be traveled under alternate assumptions about currents, wind speeds, wave direction, and engine RPMs. But there would be nothing in the book about colliding with icebergs.

There are chapters on population projections, transitional fertility, post-transitional fertility, mortality, international migration, the accuracy of past projections, and forecast uncertainties. And there are included a host of charts, graphs, data tables, and citations – for which we thank the contributors.

The report's great weakness, however, is this: It contains no discussion, evaluation, or consideration whatsoever of limits, overshoot, or planetary carrying capacity. Indeed, these terms are not to be found anywhere in the book's 217 pages, nor in its index, nor in its recommendations. To anyone who turns to BEYOND SIX BILLION to enlighten themselves about earth's population, arguably the topic's most important terms and concepts are not to be found.

For example, terms and concepts such as carrying capacity, limiting factors, overshoot, exponential, ecological release, and collapse are entirely missing,

while the words "business as usual,"  
in contrast, manage to appear repeatedly.

By including no evaluation, presentation, or analysis of the environmental impacts of a seventh, eighth, ninth, tenth, or even an eleventh billion, the BSB report has ignored the very reason that population issues should be discussed. The BSB report offers its readers no discussion, analysis, or evaluation of plausible, reasonable, unreasonable, and implausible carrying capacities. Similarly, BSB offers no discussion or contemplation of the possibility, likelihood, nor implications of limits, thresholds, and overshoot. These missing topics are serious intellectual omissions in any report carrying the imprimatur of the National Academy Press.

The decades just ahead are about hitting an iceberg – not whether we will hit the iceberg at a speed of 28 knots or 22 knots, not about whether our estimates of speed are exactly accurate or if they are off by a factor of 3%, not about whether we will hit the iceberg in thirty minutes or in thirty-one minutes.

### **Expertise and Externalities**

The report's serious omissions might have been predicted considering the make-up of the panel that conducted the study. Without criticizing any panelist as an individual or as a professional, simply consider the composition of the panel itself. Of the twenty members, two were political scientists, four were economists, five were sociologists, five were demographers, and two were statisticians or mathematicians. Two panelists brought biological credentials and ecological perspectives to the BSB panel (most notably Joel Cohen) but in general, the natural sciences, including climatology, ecology, and population biology were seriously underrepresented.

*Captain of the Titanic:* I notice that you have nothing here  
about running into icebergs. Why not?

*Economist:* Because icebergs (i.e. - carrying capacities)  
are externalities and are too unpredictable.

*Statistician:* Because icebergs are outside our field of expertise.

Our point is this: Botanists, zoologists, and population biologists would have raised and addressed these issues. So would marine and atmospheric scientists and climatologists. Alas, however, these fields were seriously underrepresented on the panel. Thus, without criticizing any non-biologists individually, it is appropriate to argue that serious review of a topic that is fundamentally biological should have included more biologists and fewer political scientists, sociologists, and economists.

The omission of carrying capacities, overshoot, and limits from BSB does not banish such topics into nonexistence, but, unfortunately, it does diminish the chances of serious public discussion. Those BSB editors or panelists who minimize or overlook such topics need to: (a) spend a few months in the poverty, crowding, and humanitarian disasters that characterize today's high-fertility states, and (b) seriously contemplate the impacts and implications arising from each of our additional billions. Not only do we multiply our humanitarian and civilizational disasters, but we also increase our biospheric assaults in the form of pollution, nuclear weapons, greenhouse gases, hydroelectric projects, bulldozers, chain saws, deforestation, pesticides, and habitat destruction.

\* There is actually an air of seemingly-deliberate complacency that the BSB report appears to urge upon its readers. For example: "There is a sense in the international aid community that the problem of rapid population growth is no longer an urgent priority." (a) Perhaps this might be explained to the millions of victims of hunger, illiteracy, poverty, disease, unemployment, lawlessness, and uncontrolled violence in the crowded and high-fertility countries of today's world. (b) Note that the BSB editors report to us a 'sense' that demographic urgency and priority are no longer necessary (which would appear to be a step above a 'gut feeling,' but perhaps several steps below the standards that we normally expect from the NRC and the National Academy Press). (c) Perhaps the editors might have sampled an assortment of other population estimates and assessments from *another* "community" or two, such as, for instance, biologists, climatologists, atmospheric scientists, oceanographers, chemists, and physicists.

In some circles, there is an assumption that our political systems, populations, and environmental systems can respond instantaneously and accurately to the onslaught of problems that each of our added billions will pose in the decades just ahead. In reality, however, it is obvious that such systems and social institutions are notoriously slow and cumbersome and virtually incapable of accurate and instantaneous responses. Population topics are not just about ultimate limits and carrying capacities, they are also about the degree and rapidity of our demands and the inadequate time we are allotting for our infrastructure, social institutions, and environmental systems to adjust.

Thus, one of our recommendations is this: The National Research Council/National Academy of Sciences should empanel a team of natural scientists (as opposed to statisticians, economists, and demographers) to analyze the earth's carrying capacity (at a Western European standard of living, for example), its assorted limits (including its capacity to tolerate damage and to degrade or assimilate wastes), and to report on the likelihood, possibility, implications, and consequences of overshoot now and/or in the decades just ahead.

This excerpt has addressed lag times, delayed feedbacks, and overshoot. We have seen that time itself is a critical factor. If we try to negotiate the curves that we encounter on a twisting mountain road at too great a speed, we do not leave ourselves or our vehicle enough time to respond to the rapidity of the changes that we face, inviting a calamitous overshoot that can

take ourselves and our vehicle off a cliff. In our next chapter, we address thresholds, tipping points, and unintended consequences, to be followed in chapter fourteen with a consideration of "the big question" - which is earth's carrying capacity for an industrialized humanity.

*A continuation of today's demographic tidal wave may constitute  
the greatest single risk that our species has ever undertaken.*

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Librarians: The book version of Weeskaop is available from  
M. Arman Publishing, Fax: 386-951-1101

Expanded implications of this excerpt are also addressed in additional PDFs in this collection:

Thin Films - Earth's razor-thin atmosphere and seas (pdf)

Numerics, demographics, and a Billion homework questions

Conservation planning - Why Brazil's 10% is not enough

Eight Assumptions that Invite Calamity

Climate - No other animals do this

Critique of Beyond Six Billion

Delayed feedbacks, limits, and overshoot

### **Sources and Cited References**

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Bongaarts and Bulatao, eds., 2000; Beyond Six Billion (National Academy Press.

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