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72 Let's *Reduce* Global Population!

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A familiar concern is holding the line on world population increase. But, some people are asking, has population growth already gone too far? In this selection, Ken Smail argues that the long-term "carrying capacity" of the planet may only be half the number of people we have now. And the time left to begin reducing population is running out fast.

The main point of this essay is simply stated. Within the next half-century, it is essential for the human species to have in place a flexible voluntary, equitable, and internationally coordinated plan to dramatically reduce world population by at least two-thirds. This process of voluntary consensus building—local, national, and global—must begin now.

The mathematical inevitability that human numbers will continue their dramatic increase over the next two generations (to perhaps 9 billion or more by the year 2050), the high probability that this numerical increase will worsen the problems that already plague humanity (economic, political, environmental, social, moral, etc.), and the growing realization that the Earth may only be able to support a global human population in the 2 to 3 billion range at an "adequate to comfortable" standard of living, only reinforce this sense of urgency.

Source: The revised version of the essay, "Negative Population Growth" (Smail, 1995), revised and expanded as "Population and Environment" (Smail, 1997a) and "Politics and the Life Sciences" (Smail, 1997b). Reprinted with permission.

There are, however, hopeful signs. In recent years, we have finally begun to come to terms with the fact that the consequences of the twentieth century's rapid and seemingly uncontrolled population growth will soon place us—if it has not done so already—in the greatest crisis our species has yet encountered.

TEN INESCAPABLE REALITIES

In order better to appreciate the scope and ramifications of this still partly hidden crisis, I shall briefly call attention to ten essential and inescapable realities that must be fully understood and soon confronted.

First, during the present century world population will have grown from somewhere around 1.6 billion in 1900 to slightly more than 6 billion by the year 2000, an almost fourfold increase in but 100 years. This is an unprecedented numerical expansion. Throughout human history, world population growth measured over similar 100-year intervals has been virtually nonexistent or, at most, modestly incremental; it has only become markedly exponential within the last few hundred years. To

illustrate this on a more easily comprehensible scale, based on the recent rate of increase of nearly 90 million per year, human population growth during the 1990s alone amounted to nearly 1 billion, an astonishing 20 percent increase in but little more than a single decade. Just by itself, this increase is equivalent to the total global population in the year 1800 and is approximately triple the estimated world population (ca. 300 million) at the height of the Roman Empire. It is a chastening thought that even moderate demographic projections suggest that this billion-per-decade rate of increase will continue well into the century, and that the current global total of 6 billion (late 1999 estimate) could easily reach 9 to 10 billion by mid-twenty-first century.

Second, even if a fully effective program of zero population growth (ZPG) were implemented immediately, by limiting human fertility to what demographers term the *replacement rate* (roughly 2.1 children per female), global population would nevertheless continue its rapid rate of expansion. In fact, demographers estimate that it would take at least two to three generations (fifty to seventy-five years) at ZPG fertility levels just to reach a point of population stability, unfortunately at numbers considerably higher than at present. This powerful *population momentum* results from the fact that an unusually high proportion (nearly one-third) of the current world population is under the age of fifteen and has not yet reproduced. Even more broad-based population profiles may be found throughout the developing world, where the under-fifteen age cohort often exceeds 40 percent and where birth rates have remained high even as mortality rates have fallen. While there are some recent indications that fertility rates are beginning to decline, the current composite for the less-developed world—excluding China—is still nearly double (ca. 3.8) that needed for ZPG.

Third, in addition to fertility levels, it is essential to understand that population growth is also significantly affected by changes in mortality rates. In fact, demographic transition theory suggests that the earlier stages of rapid population expansion are typically fueled more by significant reductions in death rates (i.e., decreased childhood mortality and/or enhanced adult longevity) than by changes in birth rates. Nor does recent empirical data suggest that average human life expectancy has reached anywhere near its theoretical upper limit, in either the developing or developed worlds. Consequently, unless there appears a deadly pandemic, a devastating world war or a massive breakdown in public health (or a combination of all three), it is obvious that ongoing global gains in human longevity will continue to make a major contribution to world population expansion over the next half-century, regardless of whatever progress might be made in reducing fertility.

Fourth, all previous examples of significant human population expansion—and subsequent (occasionally rapid) decline—have been primarily local or, at most, regional phenomena. At the present time, given the current global rate of increase of some 220,000 people per day (more than 9,000 per hour), it is ludicrous to speak of significant empty spaces left on Earth to colonize, certainly when compared with but a century ago. And it is ridiculous to suggest that "off Earth" (extraterrestrial) migration will somehow be sufficient to siphon away excess human population, in either the near or more distant future.

Fifth, given the data and observations presented thus far, it becomes increasingly apparent that the time span available for implementing an effective program of population "control" may be quite limited, with a window of opportunity—even in the more optimistic scenarios—that may not extend much beyond the middle of the next century. As mentioned previously, most middle-of-the-road demographic projections for the year 2050—two generations from now—are in the 8 to 9 billion range. Several observations might help to bring these demographic estimates and the above-mentioned "limited" time span into somewhat better perspective:

- the year 2050 is closer to the present than the year 1950
- an infant born in 2000 will be only fifty years old in the year 2050

- a young person entering the job market in the early twenty-first century will have reached retirement age in the year 2050

These observations also make it quite clear that *those already* born—ourselves, our children, and our grandchildren—will have to confront the overwhelming impact of an additional 3 to 4 billion people.

Sixth, the Earth's long-term carrying capacity, in terms of resources, is indeed finite, despite the continuing use of economic models predicated on seemingly unlimited growth, and notwithstanding the high probability of continued scientific/technological progress. Some further terminological clarification may be useful. "Long-term" is most reasonably defined on the order of several hundred years, at least; it emphatically does not mean the five-to-fifteen-year horizon typical of much economic forecasting or political prognostication. Over this much longer time span, it thus becomes much more appropriate—perhaps even essential to civilizational survival—to define a sustainable human population size in terms of optimums rather than maximums. Further, *what "could" be supported in the short term is not necessarily what "should" be humanity's goal over the longer term.*

As far as resources are concerned, whether these be characterized as renewable or nonrenewable, it is becoming increasingly apparent that the era of inexpensive energy (derived from fossil fuels), adequate food supplies (whether plant or animal), readily available or easily extractable raw materials (from wood to minerals), plentiful fresh water, and readily accessible "open space" is rapidly coming to a close, almost certainly within the next half-century. And finally, the consequences of future scientific/technological advances—whether in terms of energy production, technological efficiency, agricultural productivity, or creation of alternative materials—are much more likely to be incremental than revolutionary, notwithstanding frequent and grandiose claims for the latter.

Seventh, rhetoric about "sustainable growth" is at best a continuing exercise in economic self-deception and at worst a politically pernicious oxymoron. Almost certainly, working toward some sort of *steady-state sustainability* is much more realistic scientifically, (probably) more attainable economically, and (perhaps) more prudent politically. Assertions that the Earth might be able to support a population of 10, 15, or even 20 billion people for an indefinite period of time at a standard of living superior to the present are not only cruelly misleading but almost certainly false. Rather, extrapolations from the work of a growing number of ecologists, demographers, and numerous others suggest the distinct possibility that *the Earth's true carrying capacity—defined simply as humans in long-term adaptive balance with their ecological setting, resource base, and each other—may already have been exceeded by a factor of two or more.*

To the best of my knowledge, no evidence contradicts this sobering—perhaps even frightening—assessment. Consequently, since at some point in the not-too-distant future the negative consequences and ecological damage stemming from the mutually reinforcing effects of excessive human reproduction and overconsumption of resources could well become irreversible, and because there is only one Earth with which to experiment, it is undoubtedly better for our species to err on the side of prudence, exercising wherever possible a cautious and careful stewardship.

Eighth, only about 20 percent of the current world population (ca. 1.2 billion people) could be said to have a *generally adequate* standard of living, defined here as a level of affluence roughly approximating that of the so-called "developed" world (Western Europe, Japan, and North America). The other 80 percent (ca. 4.8 billion), incorporating most of the inhabitants of what have been termed the "developing nations," live in conditions ranging from mild deprivation to severe deficiency. Despite well-intentioned efforts to the contrary, there is little evidence that this imbalance is going to decrease in any significant way, and a strong likelihood that it may get worse, particularly in view of the fact that more than 90 percent of all future population expansion is projected to occur in these less-developed regions of the world. In fact, there is growing concern that when this burgeoning

population growth in the developing world is combined with excessive or wasteful per capita energy and resource consumption in much of the developed world, widespread environmental deterioration (systemic breakdown?) in a number of the Earth's more heavily stressed ecosystems will become increasingly likely. This is especially worrisome in regions already beset by short-sighted or counterproductive economic policies, chronic political instability, and growing social unrest, particularly when one considers that nearly all nations in the less-developed world currently have an understandable desire—not surprisingly expressed as a fundamental right—to increase their standard of living (per capita energy and resource consumption) to something approximating "first world" levels.

Ninth, to follow up on the point just made, the total impact of human numbers on the global environment is often described as the product of three basic multipliers: (1) population size; (2) per capita energy and resource consumption (affluence); and (3) technological efficiency in the production, utilization, and conservation of such energy and resources. This relationship is usually expressed by some variant of the now well-known I = PAT equation: Impact = Population × Affluence × Technology. This simple formula enables one to demonstrate much more clearly the quantitative scope of humanity's dilemma over the next fifty to seventy-five years, particularly if the following projections are anywhere near accurate:

- human population could well *double* by the end of the twenty-first century, from our current 6 billion to perhaps 12 billion or more
- global energy and resource consumption could easily *quadrupIe* or more during the same period, particularly if (as just indicated in item 8) the less-developed nations are successful in their current efforts to significantly improve their citizens' standard of living to something approaching developed-world norms
- new technologies applied to current energy and resource inefficiencies might be successful in reducing per capita waste or effluence *by half,* or even *two-thirds,* in both the developed and developing worlds

Given these reasonable estimates, the conclusion seems inescapable that the human species' total impact on the Earth's already stressed ecosystem could easily *triple to quadruple* by the middle of the twenty-first century. This impact could be even greater if current (and future) efforts at energy and resource conservation turn out to be less successful than hoped for, or if (as seems likely) the mathematical relationship between these several multipliers is something more than simply linear. It is therefore very important to keep a close watch—for harbingers of future trends and/or problems—on current events in the growing group of nations now experiencing rapid economic development and modernization, with particular attention being given to ongoing changes in India and China, two states whose combined size represents nearly half the population of the less-developed world.

Tenth, and finally, there are two additional considerations—matters not usually factored into the I = PAT equation—that must also be taken into account in any attempt to coordinate appropriate responses to the rapidly increasing global environmental impact described in points 6 through 9. First, given current and likely ongoing scientific uncertainties about environmental limits and ecosystem resilience, not to mention the potential dangers of irreversible damage if such limits are stretched too far (i.e., a permanently reduced carrying capacity), it is extremely important to design into any future planning an adequate safety factor (or sufficient margin for error). In other words, any attempt at "guided social engineering" on the massive scale that will clearly be necessary over the next century will require at least as much attention to safety margins, internal coordination, and systems redundancy as may be found in other major engineering accomplishments—from designing airplanes to building the Channel Tunnel to landing astronauts on the moon.

In addition, such planning must consider yet another seemingly intractable problem. Because the human species not only shares the Earth—but has also co-evolved—with literally millions of other life forms, the closely related issues of wilderness conservation and biodiversity preservation

must also be taken fully into account, on several different levels (pragmatic, aesthetic, and moral). In simplest terms, it has now become a matter of critical importance to ask some very basic questions about what proportion of the Earth's surface the human species has the right to exploit or transform—or, conversely, how much of the Earth's surface should be reserved for the protection and preservation of all other life forms. As many have argued, often in eloquent terms, our species will likely be more successful in confronting and resolving these questions—not to mention the other complex problems that are now crowding in upon us—*if we can collectively come to regard ourselves more as the Earth's long-term stewards than its absolute masters.*

To sum up, if the above "inescapable realities" are indeed valid, it is obvious that rational, equitable, and attainable population goals will have to be established in the very near future. It is also obvious that these goals will have to address—and in some fashion resolve—a powerful internal conflict: how to create and sustain an adequate standard of living for *all* the world's peoples, minimizing as much as possible the growing inequities between rich and poor, while simultaneously neither overstressing nor exceeding the Earth's longer-term carrying capacity. *I submit that these goals cannot be reached, or this conflict resolved, unless and until world population is dramatically reduced—to somewhere around 2 to 3 billion people—within the next two centuries.*

CRITICAL-THINKING QUESTIONS

1. Why, according to this reading, is simply holding the line on population increase not enough?
2. What about the fact that humans share the Earth with millions of other life forms? In facing up to the problem of population increase, what responsibility do we have for other species?
3. All in all, do you agree with Smail that we must find a way to reduce global population? Why or why not?

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