Boston College Environmental Affairs Law Review

Volume 8 | Issue 4 Article 1

8-1-1980

The Global 2000 Report to the President

Gus Speth

THE GLOBAL 2000 REPORT TO THE PRESIDENT

ENTERING THE TWENTY-FIRST CENTURY

Gus Speth*

MAJOR FINDINGS AND CONCLUSIONS

If present trends continue, the world in 2000 will be more crowded, more polluted, less stable ecologically, and more vulnerable to disruption than the world we live in now. Serious stresses involving population, resources, and environment are clearly visible ahead. Despite greater material output, the world's people will be poorer in many ways than they are today.

For hundreds of millions of the desperately poor, the outlook for food and other necessities of life will be no better. For many it will be worse. Barring revolutionary advances in technology, life for most people on earth will be more precarious in 2000 than it is now—unless the nations of the world act decisively to alter current trends.

This, in essence, is the picture emerging from the U.S. Government's projections of probable changes in world population, resources, and environment by the end of the century, as presented

---

* The Global 2000 Study, initiated by President Carter in 1977, is a three-year effort by the federal government to discover the long-term implications of present world trends in population, natural resources and the environment. The report was prepared by the President's Council on Environmental Quality of which Gus Speth is Chairman, in conjunction with the Department of State and eleven other federal agencies. Gerald O. Barney is the study director. *Global 2000* was transmitted to President Carter on July 24, 1980. The following is an edited version of the report. Copies of the report in its entirety may be obtained from the Superintendent of Documents. U.S. Government Printing Office, Washington, D.C. 20402.

in the Global 2000 Study. They do not predict what will occur. Rather, they depict conditions that are likely to develop if there are no changes in public policies, institutions, or rates of technological advance, and if there are no wars or other major disruptions. A keener awareness of the nature of the current trends, however, may induce changes that will alter these trends and the projected outcome.

Principal Findings

Rapid growth in world population will hardly have altered 2000. The world's population will grow from 4 billion in 1975 to 6.35 billion in 2000, an increase of more than 50 percent. The rate of growth will slow only marginally, from 1.8 percent a year to 1.7 percent. In terms of sheer numbers, population will be growing faster in 2000 than it is today, with 100 million people added each year compared with 75 million in 1975. Ninety percent of this growth will occur in the poorest countries.

While the economies of the less developed countries (LDC's) are expected to grow at faster rates than those of the industrialized nations, the gross national product per capita in most LDC's remains low. The average gross national product per capita is projected to rise substantially in some LDC's (especially in Latin America), but in the great populous nations of South Asia it remains below $200 a year (in 1975 dollars). The large existing gap between the rich and poor nations widens.

World food production is projected to increase 90 percent over the thirty years from 1970 to 2000. This translates into a global per capita increase of less than 15 percent over the same period. The bulk of that increase goes to countries that already have relatively high per capita food consumption. Meanwhile per capita consumption in South Asia, the Middle East, and the LDC's of Africa will scarcely improve or will actually decline below present inadequate levels. At the same time, real prices for food are expected to double.

Arable land will increase only 4 percent by 2000, so that most of the increased output of food will have to come from higher yields. Most of the elements that now contribute to higher yields—fertilizer, pesticides, power for irrigation, and fuel for machinery—depend heavily on oil and gas.

During the 1990's world oil production will approach geological estimates of maximum production capacity, even with rapidly in-

creasing petroleum prices. The Study projects that the richer industrialized nations will be able to command enough oil and other commercial energy supplies to meet rising demands through 1990. With the expected price increases, many less developed countries will have increasing difficulties meeting energy needs. For the one-quarter of humankind that depends primarily on wood for fuel, the outlook is bleak. Needs for fuelwood will exceed available supplies by about 25 percent before the turn of the century.

While the world's finite fuel resources—coal, oil, gas, oil shale, tar sands, and uranium—are theoretically sufficient for centuries, they are not evenly distributed; they pose difficult economic and environmental problems; and they vary greatly in their amenability to exploitation and use.

Nonfuel mineral resources generally appear sufficient to meet projected demands through 2000, but further discoveries and investments will be needed to maintain reserves. In addition, production costs will increase with energy prices and may make some nonfuel mineral resources uneconomic. The quarter of the world's population that inhabits industrial countries will continue to absorb three-fourths of the world's mineral production.

Regional water shortages will become more severe. In the 1970-2000 period population growth alone will cause requirements for water to double in nearly half the world. Still greater increases would be needed to improve standards of living. In many LDC's, water supplies will become increasingly erratic by 2000 as a result of extensive deforestation. Development of new water supplies will become more costly virtually everywhere.

Significant losses of world forests will continue over the next twenty years as demand for forest products and fuelwood increases. Growing stocks of commercial-size timber are projected to decline 50 percent per capita. The world's forests are now disappearing at the rate of 18-20 million hectares a year (an area half the size of California), with most of the loss occurring in the humid tropical forests of Africa, Asia, and South America. The projections indicate that by 2000 some 40 percent of the remaining forest cover in LDC's will be gone.

Serious deterioriation of agricultural soils will occur worldwide, due to erosion, loss of organic matter, desertification, salinization, alkalinization, and waterlogging. Already, an area of cropland and grassland approximately the size of Maine is becoming barren wasteland each year, and the spread of desert-like conditions is

likely to accelerate.

Atmospheric concentrations of carbon dioxide and ozone-depleting chemicals are expected to increase at rates that could alter the world's climate and upper atmosphere significantly by 2050. Acid rain from increased combustion of fossil fuels (especially coal) threatens damage to lakes, soils, and crops. Radioactive and other hazardous materials present health and safety problems in increasing numbers of countries.

Extinctions of plant and animal species will increase dramatically. Hundreds of thousands of species—perhaps as many as 20 percent of all species on earth—will be irretrievably lost as their habitats vanish, especially in tropical forests.

The future depicted by the U.S. Government projections, briefly outlined above, may actually understate the impending problems. The methods available for carrying out the Study led to certain gaps and inconsistencies that tend to impart an optimistic bias. For example, most of the individual projections for the various sectors studies—food, minerals, energy, and so on—assume that sufficient capital, energy, water, and land will be available in each of these sectors to meet their needs, regardless of the competing needs of the other sectors. More consistent, better-integrated projections would produce a still more emphatic picture of intensifying stresses, as the world enters the twenty-first century.

. . .

ENTERING THE TWENTY-FIRST CENTURY*

The world in 2000 will be different from the world today in important ways. There will be more people. For every two persons on the earth in 1975 there will be three in 2000. The number of poor will have increased. Four-fifths of the world's population will live in less developed countries. Furthermore, in terms of persons per year added to the world, population growth will be 40 percent *higher* in 2000 than in 1975.

The gap between the richest and the poorest will have increased. By every measure of material welfare the study provides—per capita GNP and consumption of food, energy, and minerals—the gap will widen. For example, the gap between the GNP per capita in the LDC's and the industrialized countries is projected to grow

---

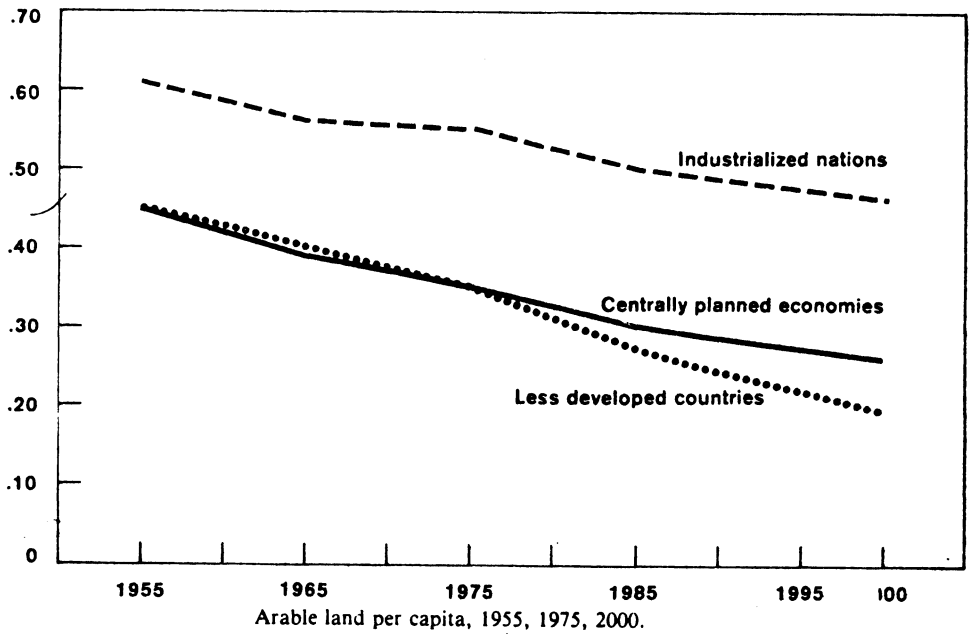
* Footnotes omitted.

from about $4,000 in 1975 to about $7,900 in 2000. Great disparities within countries are also expected to continue.

There will be fewer resources to go around. While on a worldwide average there was about four-tenths of a hectare of arable land per person in 1975, there will be only about one-quarter hectare per person in 2000 (see Figure 11 below). By 2000 nearly 1,000 billion barrels of the world's total original petroleum resource of approximately 2,000 billion barrels will have been consumed. Over just the 1975-2000 period, the world's remaining petroleum resources per capita can be expected to decline by at least 50 percent. Over the same period world per capita water supplies will decline by 35 percent because of greater population alone; increasing competing demands will put further pressure on available water supplies. The world's per capita growing stock of wood is projected to be 47 percent lower in 2000 than in 1978.

The environment will have lost important life-supporting capabilities. By 2000, 40 percent of the forests still remaining in the LDC's in 1978 will have been razed. The atomspheric concentration of carbon dioxide will be nearly one-third higher than preindustrial levels. Soil erosion will have removed, on the average, several inches of soil from croplands all over the world. Desertification (including salinization) may have claimed a significant fraction of the world's rangeland and cropland. Over little more than two decades, 15-20 percent of the earth's total species of plants and animals will have become extinct—a loss of at least 500,000 species.

Prices will be higher. The price of many of the most vital resources is projected to rise in real terms—that is, over and above inflation. In order to meet projected demand, a 100 percent increase in the real price of food will be required. To keep energy demand in line with anticipated supplies, the real price of energy is assumed to rise more than 150 percent over the 1975-2000 period. Supplies of water, agricultural land, forest products, and many traditional marine fish species are projected to decline relative to growing demand at current prices, which suggests that real price rises will occur in these sectors too. Collectively, the projections suggested that resource-based inflationary pressures will continue and intensify, especially in nations that are poor in resources or are rapidly depleting their resources.



Arable land per capita, 1955, 1975, 2000.

The world will be more vulnerable both to natural disaster and to disruptions from human causes. Most nations are likely to be still more dependent on foreign sources of energy in 2000 than they are today. Food production will be more vulnerable to disruptions of fossil fuel energy supplies and to weather fluctuations as cultivation expands to more marginal areas. The loss of diverse germ plasm in local strains and wild progenitors of food crops, together with the increase of monoculture, could lead to greater risks of massive crop failures. Larger numbers of people will be vulnerable to higher food prices or even famine when adverse weather occurs. The world will be more vulnerable to the disruptive effects of war. The tensions that could lead to war will have multiplied. The potential for conflict over fresh water alone is underscored by the fact that out of 200 of the world's major river basins, 148 are shared by two countires and 52 are shared by three to ten countries. Longstanding conflicts over shared rivers such as the Plata (Brazil, Argentina), Euphrates (Syria, Iraq), or Ganges (Bangladesh, India) could easily intensify.

Finally, it must be emphasized that if public policy continues generally unchanged the world will be different as a result of lost opportunities. The adverse effects of many of the trends discussed in this Study will not be fully evident until 2000 or later; yet the actions that are necessary to change the trends cannot be post-

poned without foreclosing important options. The opportunity to stabilize the world's population below 10 billion, for example, is slipping away; Robert McNamara, President of the World Bank, has noted that for every decade of delay in reaching replacement fertility, the world's ultimately stabilized population will be about 11 percent greater. Similar losses of opportunity accompany delayed perceptions or action in other areas. If energy policies and decisions are based on yesterday's (or even today's) oil prices, the opportunity to wisely invest scarce capital resources will be lost as a consequence of undervaluing conservation and efficiency. If agricultural research continues to focus on increasing yields through practices that are highly energy-intensive, both energy resources and the time needed to develop alternative practices will be lost.

The full effects of rising concentrations of carbon dioxide, depletion of stratospheric ozone, deterioration of soils, increasing introduction of complex persistent toxic chemicals into the environment, and massive extinction of species may not occur until well after 2000. Yet once such global environmental problems are in motion they are very difficult to reverse. In fact, few if any of the problems addressed in the Global 2000 Study are amenable to quick technological or policy fixes; rather, they are inextricably mixed with the world's most perplexing social and economic problems.

Perhaps the most troubling problems are those in which population growth and poverty lead to serious long-term declines in the productivity of renewable natural resource systems. In some areas the capacity of renewable resource systems to support human populations is already being seriously damaged by efforts of present populations to meet desperate immediate needs, and the damage threatens to become worse.

Examples of serious deterioration of the earth's most basic resources can already be found today in scattered places in all nations, including the industrialized countries and the better-endowed LDC's. For instance, erosion of agricultural soil and salinization of highly productive irrigated farmland is increasingly evident in the United States, and extensive deforestation, with more or less permanent soil degradation, has occurred in Brazil, Venezuala, and Colombia. But problems related to the decline of the earth's carrying capacity are most immediate, severe, and tragic in those regions of the earth containing the poorest LDC's.

Sub-Saharan Africa faces the problem of exhaustion of its re-

source base in an acute form. Many causes and effects have come together there to produce excessive demands on the environment, leading to expansion of the desert. Overgrazing, fuelwood gathering, and destructive cropping practices are the principal immediate causes of a series of transitions from open woodland, to scrub, to fragile semiarid range, to worthless weeds and bare earth. Matters are made worse when people are forced by scarcity of fuelwood to burn animal dung and crop wastes. The soil, deprived of organic matter, loses fertility and the ability to hold water—and the desert expands. In Bangladesh, Pakistan, and large parts of India, efforts by growing numbers of people to meet their basic needs are damaging the very cropland, pasture, forests, and water supplies on which they must depend for a livelihood. To restore the lands and soils would require decades—if not centuries—*after* the existing pressures on the land have diminished. But the pressures are growing, not diminishing.

There are no quick or easy solutions, particularly in those regions where population pressure is already leading to a reduction of the carrying capacity of the land. In such regions a complex of social and economic factors (including very low incomes, inequitable land tenure, limited or no educational opportunities, a lack of nonagricultural jobs, and economic pressures toward higher fertility) underlies the decline in the land's carrying capacity. Furthermore, it is generally believed that social and economic conditions must improve before fertility levels will decline to replacement levels. Thus a vicious circle of causality may be at work. Environmental deterioration caused by large populations creates living conditions that make reductions in fertility difficult to achieve; all the while, continuing population growth increases further the pressures on the environment and land.

The declines in carrying capacity already being observed in scattered areas around the world point to a phenomenon that could easily be much more widespread by 2000. In fact, the best evidence now available—even allowing for the many beneficial effects of technological developments and adoptions—suggests that by 2000 the world's human population may be within only a few generations of reaching the entire planet's carrying capacity.

The Global 2000 Study does not estimate the earth's carrying capacity, but it does provide a basis for evaluating an earlier estimate published in the U.S. National Academy of Sciences' report, *Resources and Man.* In this 1969 report, the Academy concluded

that a world population of 10 billion "is close to (if not above) the maximum that an *intensively managed* world might hope to support with some degree of comfort and individual choice." The Academy also concluded that even with the sacrifice of individual freedom and choice, and even with chronic near starvation for the great majority, the human population of the world is unlikely to ever exceed 30 billion.

Nothing in the Global 2000 Study counters the Academy's conclusions. If anything, data gathered over the past decade suggest the Academy may have underestimated the extent of some problems, especially deforestation and the loss and deterioration of soils.

At present and projected growth rates, the world's population would rapidly approach the Academy's figures. If the fertility and mortality rates projected for 2000 were to continue unchanged into the twenty-first century, the world's population would reach 10 billion by 2030. Thus anyone with a present life expectancy of an additional 50 years could expect to see the world population reach 10 billion. The same rate of growth would produce a population of nearly 30 billion before the end of the twenty-first century.

Here it must be emphasized that, unlike most of the Global 2000 Study projections, the population projections assume extensive policy changes and developments to reduce fertility rates. Without the assumed policy changes, the projected rate of population growth would be still more rapid.

Unfortunately population growth may be slowed for reasons other than declining birth rates. As the world's populations exceed and reduce the land's carrying capacity in widening areas, the trends of the last century or two toward improved health and longer life may come to a halt. Hunger and disease may claim more lives—especially lives of babies and young children. More of those surviving infancy may be mentally and physically handicapped by childhood malnutrition.

The time for action to prevent this outcome is running out. Unless nations collectively and individually take bold and imaginative steps toward improved social and economic conditions, reduced fertility, better management of resources, and protection of the environment, the world must expect a troubled entry into the twenty-first century.