

Population and Migration: Links with Economics, the Environment and Culture

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WHAT'S NEW, AND WHY IT MATTERS, AND WHAT TO DO

Compared to history before World War II, the human situation today is unprecedented in four respects:

- human population size and growth;
- global wealth and economic disparities between the rich and the poor;
- human impact on the environment, and vice versa; and
- widespread close contact of diverse cultural traditions.

Concerns about the present and future human population and migration cannot usefully be separated from economics, the environment, and culture. Rapid population growth and migration are linked to the fact that, worldwide, about four people in five (4.6 billion people) have an average annual income of \$1,100 per person. Only one person in five (1.2 billion people) has an average annual income of \$18,100.

The situation of the four-fifths of humanity living at very low incomes affects the United States' interests and values in eight ways:

- as potential markets for U.S. exports (economics);
- as competition for jobs (economics);
- as potential immigrants (economics and culture);
- as users of the global atmosphere, oceans, and living species (environment);

- as victims and reservoirs of infectious diseases (environment);
- as sources of political and military instability (culture);
- as supporters of, or threats to, individual freedom (culture);
- as claimants on humanitarian concerns about the well-being of fellow humans (culture).

Proposals for dealing with population problems confront an intellectual and ideological minefield. The proposals fall in three broad categories:

- **Make a bigger pie:** increase human productive capacity, for example, through investments in education, health, technological change, and new scientific developments.
- **Put fewer forks on the table and less garbage in the can:** reduce or reverse the increase in people's numbers by voluntary reductions in fertility, and reduce or reverse people's material inputs and outputs through changed behavior and more efficient manufacturing, use and recycling.
- **Practice better manners:** change the terms of people's interactions, for example, through reform of economic, political and civil institutions.

Large-scale efforts to slow or reverse human population growth follow six main approaches:

- promote abstinence or contraceptives;
- develop economies;
- improve the survival of children (so that

- parents feel less need to have many);
- empower and educate women;
- empower and educate men; and
- do everything at once.

The Oxford economist Robert Cassen remarked, “Virtually everything that needs doing from a population point of view needs doing anyway.”

To provide factual background for our face-to-face discussions, this paper surveys the demographic, economic, environmental and cultural situation of the human species today. A summary of current U.S. immigration and population growth appears under the heading of “Culture.” Issues to address include: Are there population problems that require U.S. leadership and resources in the near term, or will the problems take care of themselves? What are the stakes for the United States? What are possible policy responses?

POPULATION

The term “population” includes population size, rates of growth, location on the landscape, migration and composition (by age, gender, employment, marriage status, health characteristics, income, and levels of education and skills). A population problem arises whenever human welfare—any value held by the people concerned—suffers because of more or fewer people, a different age distribution of people, a faster or slower population growth rate, or a changed spatial distribution of population. A population problem can sometimes be ameliorated by changing other factors that affect human welfare, as well as by changing the demographic situation.

After the last Ice Age ended roughly 12,000 years ago, the Earth had about 5 million people. By A.D. 1650, the population grew to about 500 million. Over the 12,000 years up to 1650, the human population doubled in size once every sixteen or seventeen centuries, on the average. Since 1650, the population has doubled about once per century, to 5.8 billion in mid-1996. Since 1955, the population has doubled in just 40 years. Never before the second half of the twentieth century had any person lived through a doubling of global population—and now some have lived through a tripling of human numbers.

Perhaps the most important demographic event in the history of the human population occurred around 1965–70. Unexpectedly, with no fanfare at the time, the global population growth rate reached its all-time peak of about 2.1 percent per year and then gradually began to decline. The global population growth rate fell to 1.5 percent per year by 1996. This trend was accompanied by worldwide efforts to make contraception and reproductive health services available, by improvements in the survival of infants and children resulting from public health programs, by unprecedented economic development in many regions, by increasing worldwide economic integration, by massive movements of women into the paid labor market and by other cultural changes.

Current levels of global population growth are still far higher than any experienced prior to World War II. The world’s population would double in 46 years if it continued to grow at its present 1.5 percent per year. The absolute annual increase in population, currently 85–90 million people per year, poses formidable challenges of food, housing, education, health, employment, political organization and public order. An absolute increase in population by one billion people, which took from the beginning of time until about 1830, now requires about 12 years.

Global statistics conceal vastly different stories in different parts of the world. About 1.2 billion people live in the economically more developed regions, the rich countries: Europe, Northern America, Australia, New Zealand and Japan. The remaining 4.6 billion live in the economically less developed regions, the poor countries.

The population of the rich countries increases perhaps 0.1 percent per year. This growth, if continued, implies a doubling of population after more than 500 years. The population of the poor countries grows at 1.9 percent per year, a rate sufficient to double in 37 years if continued. Thus, if the rich and poor countries continued to grow at their present rates for a typical lifetime of 74 years, the population of the poor countries would grow four-fold (the result of two doublings), while the population of the rich countries would increase roughly 8 percent. The least developed regions, where the world’s poorest half billion people live, increase at 2.8 percent per year, with a doubling time of less than 25 years.

Death rates in poor countries are higher than those in rich. For example, in 1990–95, while Europe enjoyed a life expectancy above 75 years, Africa still had a life expectancy of 53 years—below the world average 20 years earlier. The average infant born in a poor country had a chance of dying before age one that was more than seven times higher than that in a rich country.

Despite higher death rates, poor countries' populations grow faster than rich countries' populations because birth rates in poor countries are much higher. At current birth rates, the average woman (worldwide) bears around 3.0 children during her lifetime. The number ranges from more than 6 in sub-Saharan Africa to 1.5 in Europe, and is more than twice as high in the poor countries as a whole (3.4 children per woman) as in the rich countries (1.6 children per woman).

Because the populations of the poor countries are growing more rapidly than those of the rich, they have a much higher fraction of people under age 15 years (35 percent vs. 20 percent in 1996) and a much lower fraction of people aged over 65 years (5 percent vs. 14 percent). The demands for investment in primary education are correspondingly greater in poor countries, in relation to the size of the population, than in the rich.

In 1990, 18 percent of males and 31 percent of females over the age of 15 were illiterate. An illiterate is defined as "a person who cannot with understanding both read and write a short, simple statement about his or her everyday life." If these rates apply to the roughly 3.9 billion people (68 percent of the population) over the age of 15 in 1996, then almost a billion adults were cut off from humanity's written culture in 1996: more than 350 million males and nearly 610 million females.

Even widespread literacy and great national wealth are no proof against serious population problems. In 1987, of the 5.4 million pregnancies among United States women, about 43 percent were intentional pregnancies, but 3.1 million (57 percent) were unintended at the time of conception. Of these, about 1.6 million (29 percent of all 1987 pregnancies) were aborted and 1.5 million (28 percent of all pregnancies) ended in a live birth. Of the 1.5 million unintended conceptions that ended in live births, almost 1.1 million were mistimed and 432,000 were unwanted.

Nonmarital births have increased dramatically as a percentage of all births in the United States (from 5.4 percent in 1965 to 28.0 percent in 1990) and in six countries of northern Europe (from 8.8 percent in 1970 to 33.3 percent in 1990).

In 1994, the world had an average population density on ice-free land of 0.42 people per hectare. A hectare is a square 100 meters on a side approximately the area of two American football fields placed side by side. In the rich countries, the population density was 0.22 people per hectare, half the global average. In the poor countries, the population density was 0.54 people per hectare. The poor countries have more than twice the population density of the rich, on average.

The human species lacks any prior experience with such rapid growth and large numbers of its own species. These growing numbers interact with the environment, economics and culture.

ENVIRONMENT

Energy use is one simple index of environmental impact and economic power. Energy use per person and population growth have interacted multiplicatively. Between 1860 and 1991, while the number of people more than quadrupled from 1.3 billion to 5.4 billion, inanimate energy use per person grew 19-fold from 0.9 megawatt-hours per year to 17.6 megawatt-hours per year. Global inanimate energy use (the product of population size and average energy use per person) grew nearly 100-fold from 1 billion megawatt-hours per year in 1860 to 95 billion megawatt-hours per year in 1991. The bulk of this energy is produced by burning fossil fuels, with global environmental effects.

Vulnerability to environmental impacts is also increasing. For example, the impact of a projected rise in sea levels increases with the tide of urbanization, as the number of people who live in coastal cities rapidly approaches one billion. With increasing frequency, people make contact with the viruses and other pathogens of previously remote forests. Cities of unprecedented population density and increased global travel provide novel opportunities for transmission of infectious agents, and new diseases are emerging.

In 60 tropical countries in 1980 (excluding eight arid African countries), the larger the number of

people per square kilometer, the smaller the percentage of land covered by forest. The forests were cleared to open land for agriculture.

Where relatively small areas of rain forest are surrounded by cleared land, as in Central America, the Philippines, Rwanda and Burundi, peasants in the cleared areas expand their areas of cultivation gradually by nibbling away at the forests. In these cases, deforestation is largely driven by local population increase.

Elsewhere, the interaction between people and forests depends on economics and culture. Population growth is not enough to explain deforestation of large blocks of rain forest. Substantial capital investment, for example, in access roads (an aspect of economics), plus an absence of enforced property rights (an aspect of culture) are also necessary for rapid deforestation. Rates of deforestation were far higher during the 1970s in Brazil, which was relatively capital-rich, than in capital-poor Bolivia and Zaire. If capital becomes scarce, fewer roads may be built in regions with large extents of rain forest. As these large tracts then remain inaccessible, people from other regions may stay home and pursue the nibbling form of deforestation.

Forests are sometimes cut because governments give land tenure or tax advantages to those who clear trees, and sometimes because domestic and international markets demand wood in quantities determined more by wealth and population density in remote cities than by human numbers in forested regions. A one-directional causal model like "human population growth destroys forests" omits too much to be useful.

The populations of some domestic animals have grown even faster than human numbers. For example, chickens numbered 13 billion around 1993, 48 percent more than in 1983. In 1994, domestic animals were fed 38 percent of all grain consumed, a fraction that changed little over the prior 20 years. For every 3 pounds of grain consumed by human beings, roughly another 2 pounds were consumed by domestic animals. Some domestic animals produce methane, liquid and solid wastes, overgraze fragile grasslands, and prevent forest regeneration.

Of the known animal extinctions since 1600, it is estimated that hunting caused 23 percent, the destruction of habitat 36 percent, the introduction of

alien species 39 percent, and other factors 2 percent. These causes of animal extinctions are driven in part by population growth and in part by many other factors such as culturally determined demands for rhinoceros horn, ivory and tiger bones; industrial and municipal waste disposal in wetlands and water bodies; international trade and development policies that push developing countries to grow cash crops for export; faulty or insufficient scientific information on the consequences of introducing species; distorted governmental policies regarding land ownership and agricultural prices; inequities in land ownership and management; market failures in valuing unpriced ecosystem services; and inadequate legal definition and enforcement of property rights.

ECONOMICS

In the aggregate production of material wealth, the half century since World War II has been a golden era of technological and economic wonders. For example, in constant prices with the price in 1990 set equal to 100, the price of petroleum fell from 113 in 1975, to 76 in 1992. The price of a basket of 33 nonfuel commodities fell from 159 in 1975, to 86 in 1992. Total food commodity prices fell from 196 in 1975, to 85 in 1992.

As the world's average economic well-being rose, economic disparities between the rich and the poor increased. In 1960, the richest countries with 20 percent of world population earned 70.2 percent of global income, while the poorest countries with 20 percent of world population earned 2.3 percent of global income. Thus the ratio of income per person between the top fifth and the bottom fifth was 31 to 1 in 1960. In 1970, that ratio was 32 to 1; in 1980, 45 to 1; in 1991, 61 to 1.

In 1994, the gross national product per person among the 1.2 billion people living in the more developed region was \$18,100, while that of the remaining 4.6 billion people was \$1,100. Roughly 20 percent of the world's population in the richest countries enjoyed roughly 80 percent of the world's income. More than 2 billion people in the poorest countries lived on an average annual income around \$400, or a dollar a day.

Dollars are not the full measure of human well-being. In developing regions, the absolute numbers

of people who were chronically undernourished fell from 941 million (36 percent of the population in developing regions) around 1970 to 786 million (20 percent) around 1990. In Africa, contrary to the world trend, the absolute number of chronically undernourished increased by two-thirds. Africa also had the highest population growth rates during this period, and still does.

Food commodity prices dropped by half, as I showed earlier, while nearly a billion people in developing countries chronically did not eat enough. This seeming contradiction is possible because the bottom billion have no money to buy food, so they cannot drive up its price. Their hunger does not register in international commodity markets. The asset the poor are able to produce most easily—an asset that they hope will help them wrest a living from often declining natural resources and provide for them in old age—is children. In developing countries, high fertility is both a cause and a consequence of poverty.

CULTURE

The widespread close contact of diverse cultural traditions is the change in recent decades that is potentially most explosive. Migrations within and between countries, business travel, tourism, media and telecommunications have shrunk the world stage. In every continent, people who vary in culture, language, religion, values, ethnicity and socially defined race increasingly share the same space for social, political and economic activities. The resulting frictions are evident in all parts of the world.

Cultural contacts appear most vividly in cities. In 1800, roughly 2 percent of people lived in cities; today, about 45 percent. The absolute number of city dwellers rose more than 140-fold from perhaps 18 million in 1800 to 2.5 billion today. Cities are forming and growing most rapidly in the poor countries. If a big city is defined as an urban region with 10 million people or more, in 1950, there was one big city in the world: New York. In 1994, there were 14 big cities in the world, and 10 of the 14 were in poor countries.

During 1990–1995, the population of cities in poor countries grew by 3.5 percent per year, while the urban population of rich countries grew by 0.8

percent per year. In both rich and poor regions, the urban population grew far faster than the total population. By 1996, in the rich countries, 75 percent of people lived in cities; in the poor, only 35 percent. Urbanization in the poor countries is likely to continue.

Most migrants move within their country of birth, usually to a city. In the 1990s, most migrants, whether legal or illegal, are seeking work, reuniting families, or fleeing violence. Some 25–30 million people are involuntarily displaced within their own country. Fewer migrants move between countries, and then usually to a neighboring country. Still fewer migrants move from one region of the world to another. Among the international migrants were more than 18 million refugees in 1993. Displaced persons and refugees total slightly less than 1 percent of world population. Environmental refugees, migrants who leave home because of environmental problems, may number 10 million or more.

At the global scale, the average number of inter-regional net migrants per year during the period 1990–1995 was 1.8 million. Most international migrants left Asia (1.4 million net emigrants per year) and Latin America and the Caribbean (0.4 million), and went to Europe (0.7 million net immigrants per year) and northern America (almost 1.0 million per year). Africa contributed, and Oceania received, much smaller numbers of net migrants annually.

In the mid-1990s, about 125 million people (2 percent of world population) reside outside of their country of birth or citizenship. In 1990, only 11 countries in the world had more than 2 million migrants, and they collectively had almost 70 million migrants. The largest numbers of migrants were in the United States (19.6 million), India (8.7 million), Pakistan (7.3 million), France (5.9 million), and Germany (5.0 million).

The countries with the highest percentage of international migrants in the total population were countries with relatively small populations. In the United Arab Emirates, Andorra, Kuwait, Monaco, and Qatar, 64 percent to 90 percent of the population were immigrants.

The 19.6 million migrants in the United States were almost 8 percent of the 1990 population. About 70 percent of migrants lived in only 5 states in 1990: California (where they were 22 percent of the population), Florida (12 percent), Illinois (8 percent), New

York (16 percent), and Texas (7 percent). Of these 19.6 million, 8.7 million, or nearly half were new immigrants who entered and remained in the U.S. between 1980 and 1990. Generally the smaller the jurisdiction, the higher the fraction of immigrants. For example, in 1990, when foreign-born people were 22 percent of California's population, the consolidated metropolitan area of Los Angeles had 27 percent foreign born; L.A. county had 33 percent, and L.A. city had 38 percent foreign born.

Decisions about how many immigrants the United States will legally receive are made by the Federal government, but the tasks of providing services fall disproportionately to a few local governments with little power to restrict their immigrant populations. The economic, social, environmental and political impacts of immigration in the United States (and in most other places) are known even less precisely than the sheer numbers, though many strong and contradictory claims are made. If local governments are providing a national benefit by serving immigrant populations, means of equi-

tably distributing the costs of those services should be considered.

Since 1990, the U.S. population has grown by about 3 million people per year (roughly an additional population of New York State in 6 years, or another California in 10 years). The excess of births over deaths has provided 2 million of the annual increase while the excess of immigration over emigration has provided the remaining 1 million. These numbers are imprecise because undocumented immigration is only estimated. Nevertheless, the annual net immigration to the United States, legal and illegal, probably does not exceed the annual number of unintended pregnancies that result in live births in the United States.

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