

Part One

KEY INDICATORS

Food Trends



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Grain Production Drops
Meat Production and Consumption Grow

In 2002, global grain production declined for the third time in four years, due mainly to drought in North America and Australia.¹ At 1,833 million tons, the harvest was 3 percent lower than the previous year's and was the smallest crop since 1995.² (See Figure 1.)

World grain production has more than doubled since 1961, mainly due to farmers harvest-

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ing more grain from each hectare, since farmers are planting grain on only slightly more land today—671 million hectares in 2002 compared with 648 million in 1967.³ The average harvest of grain from a given hectare has more than doubled worldwide, from 1.24 tons in 1961 to 2.82 tons in 2002.⁴

Still, production of the three major cereal crops declined in 2002. Global wheat production dropped to 562 million tons, down 3 percent; production of corn stood at 598 million tons, nearly 2 percent lower; and rice production, at 391 million tons, was 2 percent below output in 2001.⁵ These three grains account for 85 percent of the world's grain harvest.⁶

Global grain production is concentrated geographically. China, India, and the United States alone account for 46 percent of global production. Europe, including the former Soviet states, grows another 21 percent.⁷

Of the world's major grain-producing regions, production across Asia was up, in Europe it was stagnant, and in the North American wheat and corn belts the harvest suffered from drought and high summer temperatures.⁸ A weak and irregular monsoon reduced rice harvests in India and, to a lesser degree, in China—the world's second largest and top rice producers, respectively. The wheat harvest declined slightly in China (the world's largest producer) but was up in India (the second largest producer).⁹

In the United States, responsible for at least one third of the global corn harvest, a severe drought across the middle of the country cut production by 8 percent.¹⁰ And the U.S. wheat harvest was down by 14 percent—also due to drought.¹¹ In Australia, severe drought reduced the grain harvest by almost 40 percent.¹²

Despite a shift toward more meat eating and

greater dietary diversity around the world, people still primarily eat foods made from grain.

On average, they get about 48 percent of their calories from grains, a share that has declined just slightly from 50 percent over the last four decades.¹³ Grains, particularly corn, also form the primary feedstock for industrial livestock production.

Global grain production per person dropped to 294 kilograms in 2002, the lowest level since 1970.¹⁴ (See Figure 2.) But output per person varies dramatically by region. For instance, it stands at roughly 1,046 kilograms in North America, most of which is fed to livestock, compared with 316 kilograms in China and just 120 kilograms in sub-Saharan Africa.¹⁵

While the downward slide in the global output per person could eventually prove problematic for food supplies, the focus on this number can be misleading, since people are hungry primarily because they are too poor to purchase food, not because of an outright scarcity of food. The U.N. Food and Agriculture Organization estimates that there are at least 815 million chronically hungry people in the world, a modest decline from the 956 million estimated in 1970.¹⁶

Most of these hungry people are concentrated in India and Asia, although the most acute increase in hunger in 2002 was in sub-Saharan Africa, where roughly 40 million people are in immediate need of food aid.¹⁷ Following two consecutive years of poor grain harvests—exacerbated by drought, civil conflict, and HIV/AIDS—grain and flour prices in the region have increased beyond the reach of much of the population, and both imports and international relief have been insufficient to stem the rise.¹⁸

Global grain production exceeded consumption between 1996 and 1998, but the harvest has slipped below demand for the last four years, pushing down the stocks of grain held in private and government stores.¹⁹ World cereal stocks fell sharply, to some 466 million tons, by the end of 2002—nearly a 20-percent reduction in just one year and the lowest level in 40 years of recordkeeping.²⁰ The ratio of grain stocks to annual use also hit an all-time low.²¹ (See Figure 3.)

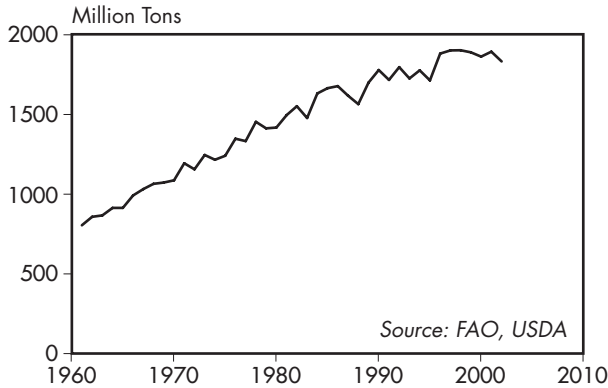


Figure 1: World Grain Production, 1961–2002

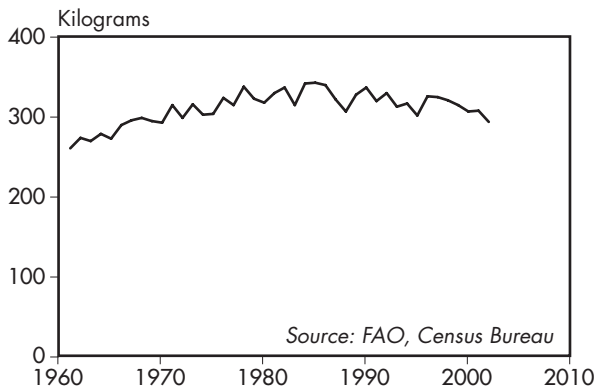


Figure 2: World Grain Production Per Person, 1961–2002

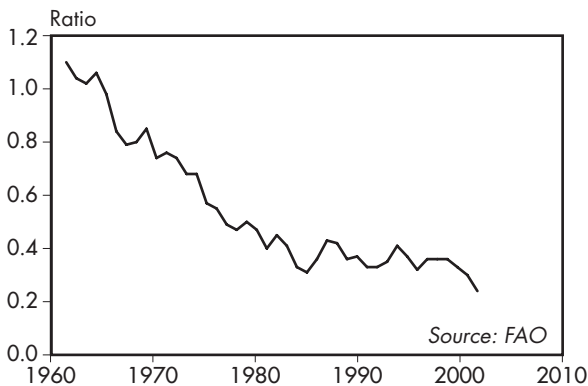


Figure 3: World Grain Stock-to-Use Ratio, 1961–2002

World Grain Production, 1961–2002

Year	Total (million tons)	Per Person (kilograms)
1961	805	261
1962	858	274
1963	867	270
1964	914	279
1965	914	273
1966	992	290
1967	1032	296
1968	1065	299
1969	1073	295
1970	1087	293
1971	1194	315
1972	1156	299
1973	1246	316
1974	1216	303
1975	1241	304
1976	1348	324
1977	1333	315
1978	1454	338
1979	1413	323
1980	1418	318
1981	1496	330
1982	1552	337
1983	1478	315
1984	1632	342
1985	1665	343
1986	1678	340
1987	1618	322
1988	1565	307
1989	1700	328
1990	1779	337
1991	1717	320
1992	1797	330
1993	1726	313
1994	1777	317
1995	1714	302
1996	1882	326
1997	1902	325
1998	1903	321
1999	1890	315
2000	1863	307
2001	1894	308
2002 (prel)	1833	294

Source: U.N. Food and Agriculture Organization.

The world's appetite for meat continues to grow, with 242 million tons produced in 2002—an increase of 2.5 percent from 2001.¹ (See Figure 1.) Meat production has doubled since 1977, and over the last half-century it has increased fivefold.² Production of beef, poultry, pork, and other meats has risen to nearly 40 kilograms per person, more than twice as much as was available in 1950.³ (See Figure 2.)

Consumers in industrial nations eat more than 80 kilograms of meat per person, most of it from pork and poultry, compared with just 28 kilograms for people in developing countries.⁴ In fact, people in industrial nations eat three to four times as much meat as people living in developing countries.⁵

Yet two thirds of the gains in meat consumption in 2002 occurred in developing countries, where urbanization, rising incomes, and the globalization of trade are changing diets and increasing per capita consumption of meat.⁶ And as developing countries climb up the “protein ladder,” they have overtaken industrial nations as meat producers by accounting for 56 percent of production—an increase of 5 percent since 1995.⁷

Pork production reached over 93 million tons in 2002, followed by poultry production (72 million tons), and beef (60 million tons).⁸ Other types of meat, including sheep and goat meat, accounted for 16 million tons of the total output.⁹ (See Figure 3.)

Pigs dominate meat production and consumption in China—half of the world's pigs are raised and eaten there.¹⁰ The United States produces and consumes the most poultry in the world, and Brazil is the world's largest producer of beef and its second-largest consumer, behind only the United States.¹¹

Since the early 1960s, the number of livestock has increased 60 percent, from 3 billion to more than 5 billion, and the number of fowl has quadrupled from 4 billion to 16 billion.¹² Industrial feedlots are the most rapidly growing production system for these animals, producing 43 percent of the world's beef and more than half of the world's pork and poultry.¹³ These “factory farms” are also responsible for huge

amounts of manure and air pollution and for the overuse of antibiotics as crowded conditions encourage the rapid spread of disease.

Producing meat requires large amounts of grain—most of the corn and soybeans harvested in the world are used to fatten livestock.¹⁴ Producing 1 calorie of flesh (beef, pork, or chicken) requires 11–17 calories of feed. So a meat eater's diet requires two to four times more land than a vegetarian's diet.¹⁵ Soybeans, wheat, rice, and corn also produce three to eight times as much protein as meat.¹⁶

The U.N. Food and Agriculture Organization predicts that meat production will grow to more than 300 million tons by 2020.¹⁷ Environmental and health concerns could be a constraint on that, however. Manure from hog factories, chicken houses, and feedlots for cattle can contaminate groundwater and rivers and can pollute the air.¹⁸ Cattle also contribute to climate change by emitting methane gas, and overgrazing has decimated once fertile and productive grasslands from Africa to Latin America.¹⁹

Meat recalls, foot-and-mouth disease, and mad cow disease (BSE—bovine spongiform encephalopathy) have increased concerns about the safety of eating meat. During the summer of 2002, millions of pounds of contaminated beef and other meat products were recalled by the U.S. government.²⁰ In Japan, beef consumption has been declining since the first case of BSE was reported there in 2001.²¹ Concerns over drug residues in poultry led to market closures for U.S.-produced chicken in the Russian Federation.²²

In the United States, high rates of obesity, heart disease, cancer, and other diseases associated with high-fat, high-cholesterol diets have led some people to shun red meat in favor of chicken and others to give up meat entirely. The popularity of grass-fed and organic meats is also rising as consumers realize the high health and environmental costs of meat raised in factory farms.²³

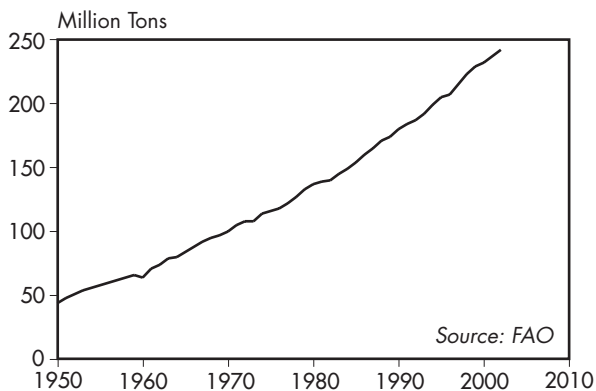


Figure 1: World Meat Production, 1950–2002

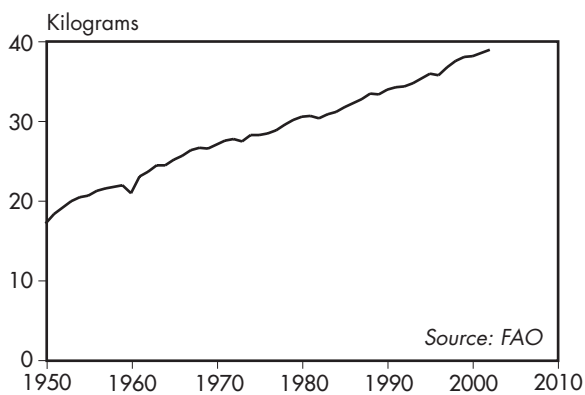


Figure 2: World Meat Production Per Person, 1950–2002

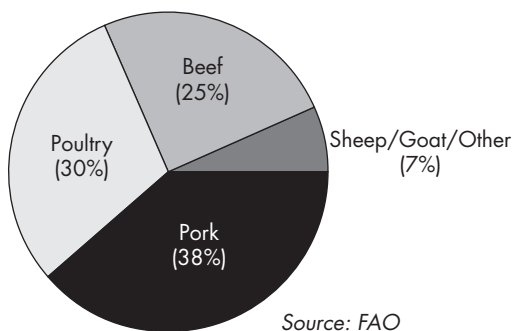


Figure 3: World Meat Production by Source, 2002

World Meat Production, 1950–2002

Year	Total (million tons)	Per Person (kilograms)
1950	44	17.2
1955	58	20.7
1960	64	21.0
1965	84	25.2
1970	100	27.1
1971	105	27.6
1972	108	27.8
1973	108	27.5
1974	114	28.3
1975	116	28.3
1976	118	28.5
1977	122	28.9
1978	127	29.6
1979	133	30.2
1980	137	30.6
1981	139	30.7
1982	140	30.4
1983	145	30.9
1984	149	31.2
1985	154	31.8
1986	160	32.3
1987	165	32.8
1988	171	33.5
1989	174	33.4
1990	180	34.0
1991	184	34.3
1992	187	34.4
1993	192	34.8
1994	199	35.4
1995	205	36.0
1996	207	35.8
1997	215	36.8
1998	223	37.6
1999	229	38.1
2000	232	38.2
2001	237	38.6
2002 (prel)	242	39.0

Source: U.N. Food and Agriculture Organization.

Energy and Atmosphere Trends



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Fossil Fuel Use Up
Nuclear Power Rises
Wind Power's Rapid Growth Continues
Carbon Emissions and Temperature Climb

The global use of fossil fuels (coal, oil, and natural gas) increased by 1.3 percent in 2002, to 8,034 million tons of oil equivalent, according to preliminary estimates based on government and industry sources.¹ (See Figure 1.) This compares with a 0.3-percent rise in 2001.² Fossil fuel consumption was 4.7 times the level in 1950, and it now accounts for 77 percent of world energy use.³

Global oil use rose by just 0.5 percent in 2002, due in part to a sluggish global economy, according to International Energy Agency (IEA) early estimates.⁴ (See Figure 2.) The United States, which uses about 26 percent of global oil, saw only a slight increase in demand.⁵ And oil use fell in Europe by an estimated 0.7 percent.⁶ It also declined by 0.6 percent (combined average) in Japan, South Korea, Australia, and New Zealand and by 2.6 percent in Latin America.⁷ Growth was strongest in China, where demand was up 5.7 percent, followed by the Middle East (2.5 percent) and the former Soviet bloc (1.9 percent).⁸

After a brief but steep decline in the late 1990s, coal use is again on the rise. In 2002, global coal consumption was an estimated 2,298 million tons of oil equivalent—1.9 percent above the 2001 figure.⁹ In the United States, which uses nearly 25 percent of the world's coal, demand fell by about 0.5 percent.¹⁰ But China, accounting for 23 percent of global coal use, saw an increase of around 4.9 percent—a sharp rebound following declines in the late 1990s.¹¹ While China has banned coal burning in some regions with smog and acid rain problems, output from state mines has increased recently.¹²

Natural gas consumption grew by 2 percent, to 2,207 million tons of oil equivalent.¹³ The United States, which consumes about 27 percent of the world's natural gas, used 3.7 percent less during the first 10 months of 2002 compared with the same period in 2001.¹⁴ The decline was due primarily to mild winter weather early in the year. Among industrial nations as a whole, natural gas use fell 2.4 percent through November, with the greatest drop in Japan (down 10.4 percent) and the highest increase in Norway (up 81 percent).¹⁵

Globally, however, natural gas has become the fastest growing of the fossil fuels, and represents an increasing share of global energy use. Today natural gas accounts for nearly 24 percent of world energy consumption, compared with 22.5 percent a decade ago.¹⁶ The increase is due to a number of factors, including an abundance of gas supplies in many countries and the lower environmental impacts of gas use compared with the other fossil fuels.¹⁷ Much of the recent rise in gas use and the projected future increase result from efforts to reduce emissions of air pollutants—primarily through switching from coal and oil to gas in power plants.¹⁸

In the short term, major uncertainties remain in assessing future trends for fossil fuel use, including the potential economic and political consequences of turmoil in the Middle East. The return of El Niño in late 2002 and early 2003 will likely alter rainfall patterns and bring more extreme temperatures, affecting hydropower production and natural gas demand as weather patterns shift.

For the longer term, the International Energy Agency projects that global primary energy demand will increase 1.7 percent annually between 2000 and 2030, reaching 15,300 million tons of oil equivalent in 2030.¹⁹ Fossil fuels are expected to meet more than 90 percent of the increased demand, with most of this growth occurring in the developing world.²⁰ But even with this rapid growth, the IEA projects that 18 percent of the people in the world in 2030 will still lack access to modern energy services such as electricity.²¹

Yet the IEA forecast is based on assumptions that are tenuous at best. It assumes that prices for most fuels will remain virtually unchanged through 2010 and that energy taxes will not be modified. It also assumes that global oil production will continue to rise, despite the fact that many analysts project it will peak prior to 2020.²² While oil consumption is likely to be limited by geological and political constraints, combustion of coal will probably be limited by its associated health and environmental costs, particularly global climate change.

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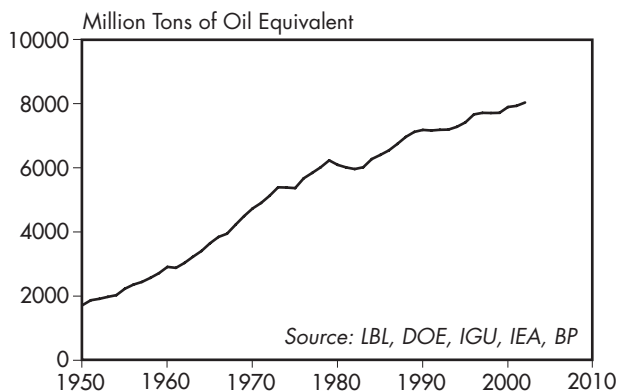


Figure 1: World Fossil Fuel Consumption, 1950–2002

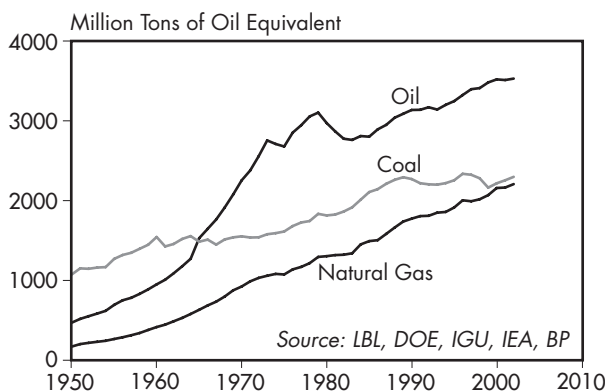


Figure 2: World Fossil Fuel Consumption by Source, 1950–2002

World Fossil Fuel Consumption, 1950–2002

Year	Coal	Oil	Natural Gas
	(million tons of oil equivalent)		
1950	1,074	470	171
1955	1,270	694	266
1960	1,544	951	416
1965	1,486	1,530	632
1970	1,553	2,254	924
1971	1,538	2,377	988
1972	1,540	2,556	1,032
1973	1,579	2,754	1,059
1974	1,592	2,710	1,082
1975	1,613	2,678	1,075
1976	1,681	2,852	1,138
1977	1,726	2,944	1,169
1978	1,744	3,055	1,216
1979	1,834	3,103	1,295
1980	1,814	2,972	1,304
1981	1,826	2,868	1,318
1982	1,863	2,776	1,322
1983	1,914	2,761	1,340
1984	2,011	2,809	1,451
1985	2,107	2,801	1,493
1986	2,143	2,893	1,504
1987	2,211	2,949	1,583
1988	2,261	3,039	1,663
1989	2,293	3,088	1,738
1990	2,270	3,136	1,774
1991	2,218	3,138	1,806
1992	2,204	3,170	1,810
1993	2,200	3,141	1,849
1994	2,219	3,200	1,858
1995	2,255	3,247	1,914
1996	2,336	3,323	2,004
1997	2,324	3,396	1,992
1998	2,280	3,410	2,017
1999	2,163	3,481	2,069
2000	2,217	3,519	2,158
2001	2,255	3,511	2,164
2002 (prel)	2,298	3,529	2,207

Source: Worldwatch estimates based on BP, DOE, IEA, IGU, and LBL.

Between 2001 and 2002, total installed nuclear power generating capacity increased by more than 5,000 megawatts (nearly 1.5 percent), the fastest percentage growth for the industry since 1993.¹ (See Figure 1.) Seven new reactors were grid-connected in 2002—four in China, two in South Korea, and one in the Czech Republic—bringing the world's total to 437.² Additional capacity increases in 2002 came from squeezing more power from existing reactors.

In 2002, construction started on six new reactors, all in India.³ (See Figure 2.) Some 25 reactors remain under active construction (with a combined capacity of 20,959 megawatts), the fewest since the 1960s.⁴ And seven reactors were permanently closed, bringing the total number of retired reactors to 106 (representing 31,439 megawatts).⁵ (See Figure 3.)

China expects to complete construction on another four reactors in the next few years, with plans to quadruple existing capacity to 20,000 megawatts by 2020.⁶ Likewise, India's recent surge in new construction will increase the country's nuclear generating capacity by nearly 150 percent, to 6,000 megawatts. India's goal for 2020 is also 20,000 megawatts of nuclear capacity.⁷

In some traditional markets, however, nuclear power is facing tougher times. The privatized English nuclear company, British Energy, was saved from receivership last year by a government bailout.⁸ Nuclear power simply proved too costly for the competitive U.K. electricity market. The company moved to sell its stakes in U.S. and Canadian nuclear energy companies, perhaps frustrating efforts to restart two mothballed reactors in Canada.⁹

Belgium's government furthered its effort to phase out nuclear power by 2025 with a parliamentary vote of approval.¹⁰ The Finnish parliament, in contrast, narrowly voted in favor of building the country's fifth reactor.¹¹ Still, not a single new reactor is under construction in Western Europe.

In Eastern Europe, Romania moved closer to obtaining financing to restart construction on its second reactor, which began in 1982.¹² Russia continues to have two reactors under construc-

tion, but Ukraine made little progress in obtaining resources to restart mothballed projects.¹³

In the United States, the biggest owner of nuclear power, Exelon Corp., dropped out of an international consortium to develop a new, smaller power plant.¹⁴ Despite press reports that utilities planned to build new reactors, no serious movement in that direction occurred as the U.S. electric industry reeled from financial losses, scandals, and generation overcapacity.¹⁵

Japan's nuclear industry suffered "the most serious setback ever in public trust in the country's nuclear power program" in 2002: it was disclosed that the country's largest utility and nuclear operator, Tokyo Electric (Tepco), had been systematically falsifying safety inspections since the late 1980s.¹⁶ As government regulators scrambled to close Tepco's reactors, the scandal spread to other utilities, where similar falsification became evident.¹⁷

The cover-up had immediate consequences for Japan's industry, which only has three reactors under construction. The governor of Fukui withdrew permission to build two new reactors in his province, and two other governors rescinded their consent to load mixed plutonium/uranium fuel in existing reactors as planned.¹⁸

South Korea completed two more reactors in 2002, leaving just two under construction there at year's end. But the country anticipates completing eight more reactors in the next 11 years.¹⁹

Concerns over the proliferation of nuclear weapons rose significantly in 2002, colliding with plans to build nuclear power reactors in both Iran and North Korea. The United States accused Iran of working on nuclear weapons, although it failed to convince Russia to stop helping Iran finish at least two reactors.²⁰ Iran says it is preparing for 6,000 megawatts of new power reactors.²¹

Meanwhile, the fate of two reactors to be built in North Korea was unclear after the country admitted having a secret nuclear weapons program.²² The reactors, first promised in 1994 by South Korea, Japan, and the United States in exchange for ending a weapons program, were in the early stages of construction as of late 2002.

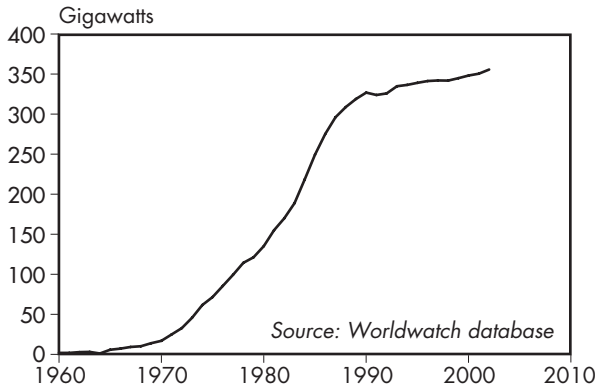


Figure 1: World Electrical Generating Capacity of Nuclear Power Plants, 1960–2002

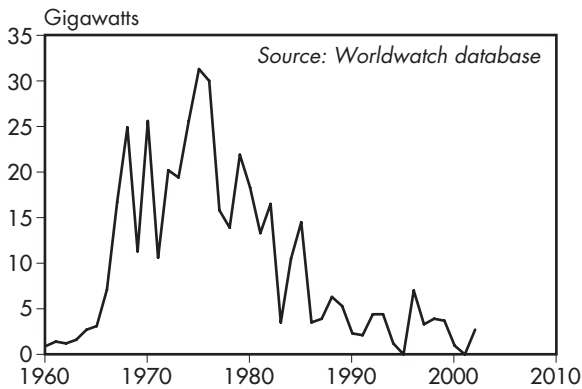


Figure 2: World Nuclear Reactor Construction Starts, 1960–2002

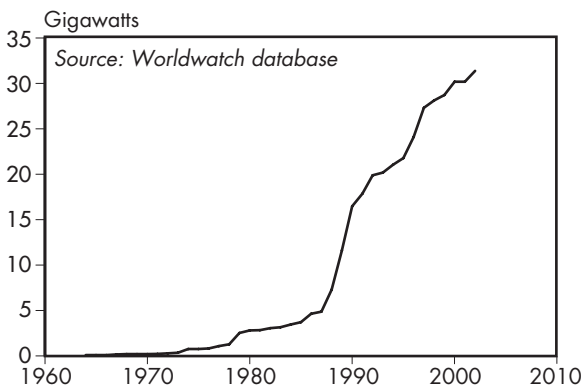


Figure 3: Nuclear Capacity of Decommissioned Plants, 1964–2002

World Net Installed Electrical Generating Capacity of Nuclear Power Plants, 1960–2002

Year	Capacity (gigawatts)
1960	1
1965	5
1970	16
1971	24
1972	32
1973	45
1974	61
1975	71
1976	85
1977	99
1978	114
1979	121
1980	135
1981	155
1982	170
1983	189
1984	219
1985	250
1986	276
1987	297
1988	310
1989	320
1990	328
1991	325
1992	327
1993	336
1994	338
1995	340
1996	343
1997	343
1998	343
1999	346
2000	349
2001	352
2002 (prel)	357

Source: Worldwatch Institute database, compiled from the IAEA and press reports.

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Wind energy generating capacity reached nearly 32,000 megawatts by the end of 2002, an increase of 27 percent over 2001.¹ (See Figure 1.) Spurred on by falling costs, concern about climate change, and new government policies, wind remains the fastest-growing energy source in the world. Global wind capacity has tripled since 1998.² In early 2002, wind power provided enough electricity to meet the residential electricity needs of 35 million people worldwide.³ Many more people get at least some of their electricity from the wind.

Global capacity net additions in 2002 totaled approximately 6,720 megawatts—a new record.⁴ (See Figure 2.) Yet the rate of growth was slower than expected due to a slump in the U.S. market, which continues to swing widely in response to short-term extensions of a federal wind energy tax credit. The United States installed only 410 megawatts of new capacity in 2002, compared with 1,714 megawatts in 2001, bringing its total to 4,685 megawatts.⁵ But up to 1,800 more megawatts are expected in 2003 as developers rush to install projects before the tax credit expires at year's end.⁶

Europe installed an estimated 5,870 megawatts of capacity in 2002, 31 percent more than in 2001.⁷ Europe has nearly 73 percent of global wind capacity—thanks to strong, consistent policies driving demand for renewable energy technologies, particularly in Germany, Spain, and Denmark, which accounted for 90 percent of the capacity installed in Europe during 2002.⁸

In fact, more than half of Europe's and 38 percent of the world's wind capacity is found in Germany.⁹ In 2002, Germany set another record, adding 3,250 megawatts to end the year with just over 12,000 megawatts of total capacity—enough to provide 4.7 percent of the nation's electricity.¹⁰ In October, Chancellor Schröder announced plans to reduce Germany's greenhouse gas emissions 40 percent by 2020.¹¹ Wind power will play a large role in this plan.

Spain experienced another strong growth year as well, adding 1,490 megawatts for a total of 4,830 megawatts, surpassing the United States to rank second worldwide.¹² This is an

impressive accomplishment, given that Spain's wind industry is not yet a decade old.

Denmark, a nation of just 5 million people, also installed more wind capacity than the United States. With the addition of nearly 500 megawatts, Denmark ended 2002 with about 2,880 megawatts, enough to generate 21 percent of the country's electricity.¹³ Much of this new capacity is operating offshore, thanks to completion of the Horns Rev 160-megawatts project, the world's largest offshore wind farm.¹⁴

The United Kingdom, despite having the best wind resources in Europe, continues to experience slow growth. It ended 2002 with about 556 megawatts of wind capacity, a 31-megawatt increase.¹⁵ The future looks brighter, however, as planning permission has been granted for the next 450 turbines onshore and the first 90 for offshore use.¹⁶

Italy added 100 megawatts to maintain its position of sixth overall, ending the year with about 800 megawatts.¹⁷ The Netherlands added 217 megawatts, for a total of 740 megawatts.¹⁸ And three new markets emerged—in Norway (added 80 megawatts), Poland (30 megawatts), and Latvia (21 megawatts).¹⁹

Beyond Europe and the United States, the most significant growth was in Asia. India added 250 megawatts, keeping it in fifth place with 1,702 megawatts, while Japan's capacity rose 36 percent to 486 megawatts.²⁰ Although China's market appears to have slowed in 2002, rising by 16 percent to about 470 megawatts, that country has more than 1,800 megawatts of wind capacity in the development pipeline.²¹ Future growth in Japan and China is expected to be rapid, as even offshore wind is now cost-competitive with many conventional energy options.²²

The global wind industry currently employs about 100,000 people.²³ Most of the jobs are in Europe, and European companies manufacture 80 percent of all wind turbines sold worldwide.²⁴ The global large-turbine market is expected to surpass \$16 billion annually by 2007.²⁵ The investment firm Merrill Lynch projects that wind power will grow 15-fold over the next 20 years.²⁶

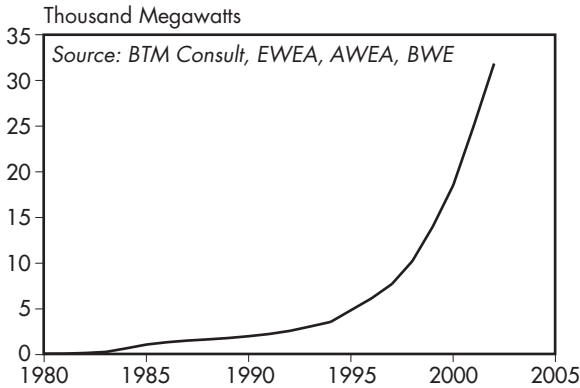


Figure 1: World Wind Energy Generating Capacity, 1980–2002

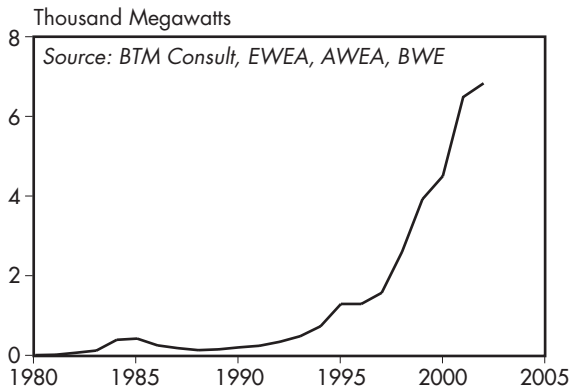


Figure 2: Annual Addition to World Wind Energy Generating Capacity, 1980–2002

World Wind Energy Generating Capacity, Total and Net Annual Additions, 1980–2002

Year	Total	Annual Addition
	(megawatts)	
1980	10	5
1981	25	15
1982	90	65
1983	210	120
1984	600	390
1985	1,020	420
1986	1,270	250
1987	1,450	180
1988	1,580	130
1989	1,730	150
1990	1,930	200
1991	2,170	240
1992	2,510	340
1993	2,990	500
1994	3,490	730
1995	4,780	1,290
1996	6,070	1,290
1997	7,640	1,570
1998	10,150	2,510
1999	13,930	3,780
2000	18,450	4,520
2001	24,930	6,480
2002 (prel)	31,650	6,720

Source: BTM Consult, EWEA, AWEA, and BWE.

Global average temperature climbed to 14.52 degrees Celsius in 2002, supplanting 2001 as the second hottest year since recordkeeping began in the late 1800s, according to the Goddard Institute for Space Studies.¹ (See Figure 1.) Other centers of climate analysis, using roughly the same network of land and sea temperature gauges, also rank 2002 as second only to 1998 in warmth, and find that the nine warmest years have occurred since 1990.²

Scientists have linked the warming trend that took off in the twentieth century to the buildup of carbon dioxide (CO₂) and other heat-trapping gases.³ By burning fossil fuels, people released some 6.44 billion tons of carbon into the atmosphere in 2002, a 1-percent increase over the previous year, raising atmospheric CO₂ concentration to 372.9 parts per million by volume.⁴ (See Figure 2.)

Measurements taken at the Mauna Loa Observatory in Hawaii show an 18-percent increase in CO₂ levels from 1960 to 2002.⁵ Scientists estimate that levels have risen 31 percent since the onset of the Industrial Revolution around 1750.⁶ The current concentration has not been exceeded in at least 420,000 years—and likely in 20 million years.⁷

Oscillations in the temperature of the tropical Pacific Ocean are linked to atmospheric CO₂ levels as well as to year-to-year fluctuations in temperature.⁸ The world's oceans, which contain about 50 times as much CO₂ as the atmosphere does, are able to take up more carbon when cool.⁹ When the sea surface warms in the equatorial Pacific, as it does during an El Niño event, the ocean absorbs less carbon, so atmospheric CO₂ levels rise, along with global temperature.¹⁰

In May 2002, ocean buoys in the central Pacific started reading warmer-than-average temperatures, heralding the onset of El Niño, which persisted into 2003, sharply changing patterns of rainfall, temperature, and winds in some regions and contributing to, for instance, droughts in India, Australia, and Africa and floods in Europe.¹¹ Scientists believe that this El Niño may help push global average tempera-

ture to a new high in 2003.¹²

Indicators of a warming world abound. Biologists are recording spring events such as the first flowering of plants and the arrival of migrant birds occurring earlier, and are finding the geographic ranges of birds, butterflies, and herbs moving poleward.¹³ Mountaintop glaciers are retreating in Alaska, Asia, the Alps, Indonesia, Africa, and South America.¹⁴ Global sea levels rose in the twentieth century about 1–2 millimeters a year, faster than in the nineteenth century.¹⁵

Poor nations are the most vulnerable to climate change. As temperatures have risen on mountaintops in Rwanda and in other African highlands, malaria-carrying mosquitoes have extended their range, infecting more people.¹⁶ Cholera bacteria thrived in the warm ocean waters of the 1997–98 El Niño, which flooded the Indian Ocean coast, prompting cholera outbreaks in Djibouti, Somalia, Kenya, Tanzania, and Mozambique.¹⁷ Over the last two decades, floods and other weather-related disasters were among the factors prompting some 10 million people to migrate from Bangladesh to India.¹⁸

Wealthy nations contribute the most to climate change. With less than 5 percent of the world's population, the United States is the single largest source of carbon from fossil fuel burning—emitting 24 percent of the world's total.¹⁹ Per person, U.S. emissions are roughly double that of other major industrial nations and 17 times that of India.²⁰ (See Figure 3.) China, home to one fifth of the world's people, ranks a distant second to the United States in emissions, with just 12 percent of the total.²¹

Some progress toward reducing global carbon emissions was made in 2002, when Japan, Canada, and the 15 nations of the European Union ratified the 1997 Kyoto Protocol on climate change.²² For the protocol to come into force, 55 nations representing 55 percent of the 1990 emissions of industrial and former Eastern bloc nations must ratify it. By the end of January 2003, 104 nations representing 44 percent of emissions had done so.²³ As the United States and Australia have pulled out of the process, Russia must ratify the protocol for it to come into force.²⁴

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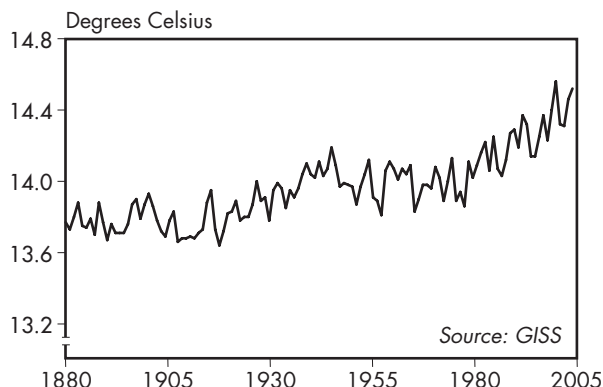


Figure 1: Global Average Temperature at Earth's Surface, 1880–2002

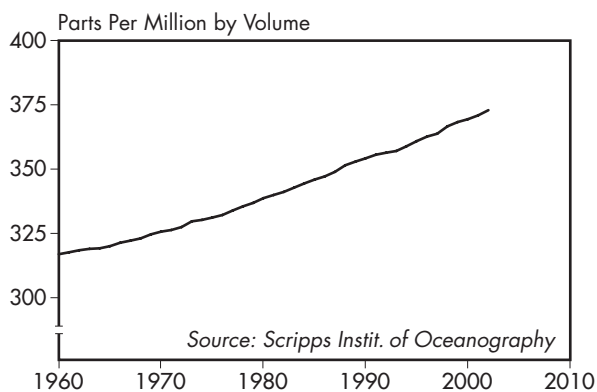


Figure 2: Atmospheric Concentrations of Carbon Dioxide, 1960–2002

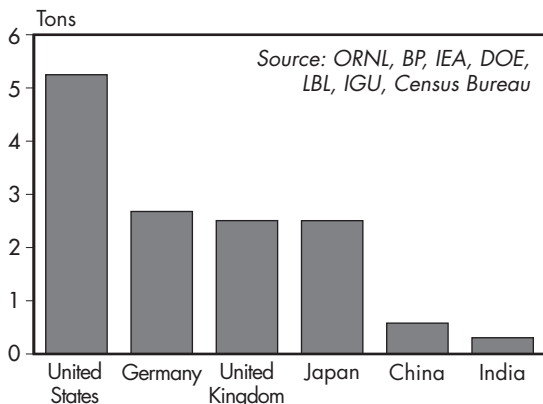


Figure 3: Carbon Emissions Per Person in Selected Countries, 2002

Global Average Temperature and Carbon Emissions from Fossil Fuel Burning, 1950–2002, and Atmospheric Concentrations of Carbon Dioxide, 1960–2002

Year	Temperature (degrees Celsius)	Emissions (mill. tons of carbon)	Carbon Dioxide (parts per mill. by vol.)
1950	13.87	1612	n.a.
1955	13.89	2013	n.a.
1960	14.01	2535	316.7
1965	13.9	3087	319.9
1970	14.02	3997	325.5
1975	13.94	4518	331.0
1976	13.86	4776	332.0
1977	14.11	4910	333.7
1978	14.02	4961	335.3
1979	14.09	5249	336.7
1980	14.16	5177	338.5
1981	14.22	5004	339.8
1982	14.06	4961	341.0
1983	14.25	4944	342.6
1984	14.07	5116	344.2
1985	14.03	5277	345.7
1986	14.12	5439	347.0
1987	14.27	5561	348.7
1988	14.29	5774	351.3
1989	14.19	5882	352.7
1990	14.37	5953	354.0
1991	14.32	6023	355.5
1992	14.14	5907	356.4
1993	14.14	5904	357.0
1994	14.25	6053	358.9
1995	14.37	6187	360.9
1996	14.23	6326	362.6
1997	14.40	6422	363.8
1998	14.56	6407	366.6
1999	14.32	6239	368.3
2000	14.31	6315	369.4
2001	14.46	6378	370.9
2002 (prel)	14.52	6443	372.9

Source: Goddard Institute for Space Studies, ORNL, BP, IEA, DOE, IGU, LBL, and Scripps Instit. of Oceanography.

Economic Trends



Lauren Goodsmith

Economic Growth Inches Up
Foreign Debt Declines
Advertising Spending Stays Nearly Flat
Tourism Growing But Still Shaky
World Heritage Sites Rising Steadily

Gross world product (GWP)—the aggregated estimate of the global output of goods and services—increased 2.5 percent in 2002, to \$48 trillion (in 2001 dollars).¹ (See Figure 1.)

Although this means the GWP reached another new high, the increase was below the average of 3.9 percent seen over the years since 1950.²

The United States, which accounts for 22 percent of the GWP, increased output by 2.2 percent, driven primarily by robust consumer spending that recovered quickly after the terrorist attacks in September 2001.³ Latin America's product declined by 0.7 percent, primarily due to the economic crisis in Argentina, which in

turn reduced investor confidence in the region.⁴ Asia's economy grew by 3.8 percent, spurred by

global trade, consumer demand in China and South Korea, and the start of a recovery in the information technology sector.⁵ In Africa, gross regional product grew by 2.4 percent—just shy of the global average—but per capita growth there was a mere 0.3 percent as population increased by 18 million.⁶

With the world's population growing by 74 million in 2002, per capita GWP only increased 1.3 percent, to \$7,714.⁷ Because governments need to expand infrastructure to keep up with growing numbers, the benefits of economic growth are limited by population growth.⁸

In recent years, a growing number of experts have challenged GWP as an accurate measure of economic growth, let alone of progress.⁹ First and foremost, GWP is an absolute measure, counting all expenditures as positive contributions, regardless of their worth to society.¹⁰ It also omits key economic sectors, like subsistence farming and household maintenance.¹¹ As a counter to this, Redefining Progress, a U.S. nongovernmental research group, created the Genuine Progress Indicator (GPI), which subtracts costs to the economy such as traffic, pollution, and crime while adding unaccounted benefits such as unpaid child care and volunteer work. In the United States, per capita GDP grew 77 percent from 1975 to 2000—compared with GPI growth of just 2 percent.¹² (See Figure 2.)

GWP also ignores the environmental costs of economic activities and does not factor in the value of nature's services on which the global economy depends. These services, such as food production, waste treatment, and climate regulation, have been estimated to be worth anywhere from \$18 trillion to \$62 trillion—roughly the size of the GWP itself.¹³ One recent analysis determined that the wealth of several countries has declined even while gross national product has increased, once depletion of natural capital is factored in.¹⁴

With growing concern about climate change and shrinking natural resources, many observers are questioning whether traditional economic growth can continue to be thought of as a positive. One measure, the “ecological footprint,” looks at per capita use of renewable resources and compares this to the capacity of Earth to generate them. This conservative estimate, which does not include the needs of other species, nonrenewable resource use, or pollution, finds that on average each person uses the resources of 2.3 “global hectares” of productive land.¹⁵ Yet there is only an average of 1.9 hectares of productive area available per person globally.¹⁶

Thus humanity is withdrawing resources 20 percent faster than Earth can renew them (see Figure 3) and is consequently depleting the world's ecological assets.¹⁷ Indeed, studies show that humans have fully exploited or depleted two thirds of ocean fisheries and have transformed or degraded up to half of Earth's land.¹⁸

Few countries have remained within their respective ecological capacities—let alone within the global average—and many have far exceeded them. The United States, for instance, used up 9.7 hectares worth of resources per person in 1999—45 percent more than the 5.3 hectares available to each citizen.¹⁹ Even without continued population growth, if the world were to consume as much meat and use as much fossil fuels as Americans do, it would need the resources of five Earths.²⁰

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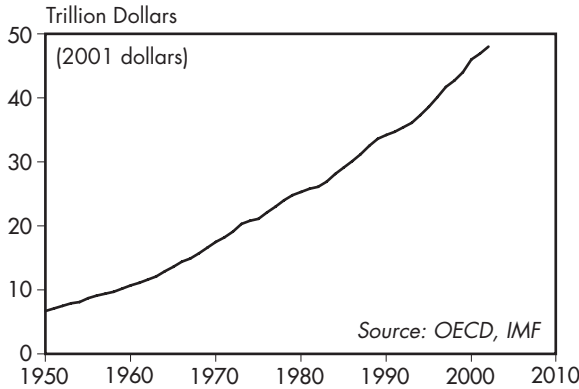


Figure 1: Gross World Product, 1950–2002

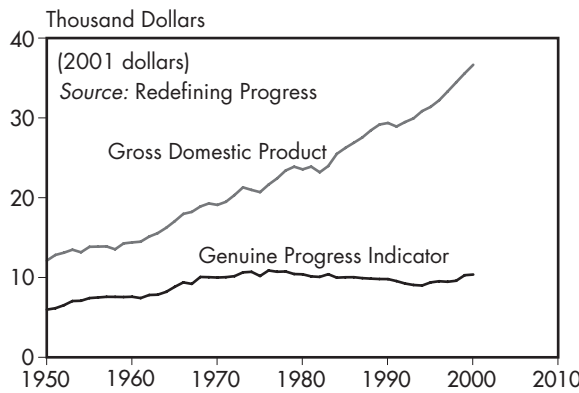


Figure 2: Gross Domestic Product and Genuine Progress Indicator Per Person, United States, 1950–2000

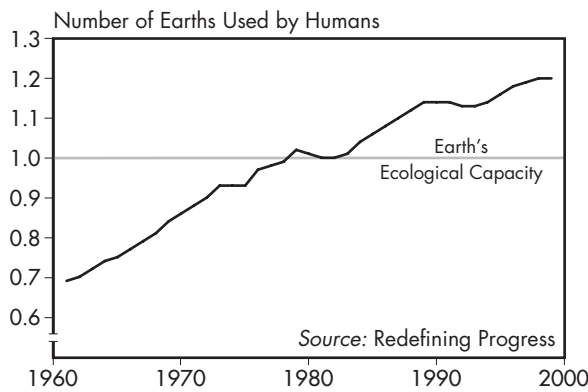


Figure 3: World Ecological Footprint, 1961–99

Gross World Product, 1950–2002

Year	Total (trill. 2001 dollars)	Per Person (2001 dollars)
1950	6.7	2,641
1955	8.7	3,112
1960	10.7	3,516
1965	13.6	4,071
1970	17.5	4,708
1971	18.2	4,805
1972	19.1	4,933
1973	20.3	5,157
1974	20.8	5,174
1975	21.1	5,154
1976	22.1	5,312
1977	23.0	5,432
1978	24.0	5,573
1979	24.8	5,672
1980	25.3	5,688
1981	25.8	5,698
1982	26.1	5,664
1983	26.9	5,728
1984	28.1	5,890
1985	29.1	5,993
1986	30.1	6,101
1987	31.2	6,216
1988	32.5	6,375
1989	33.6	6,470
1990	34.2	6,492
1991	34.7	6,468
1992	35.4	6,499
1993	36.1	6,538
1994	37.3	6,663
1995	38.6	6,791
1996	40.1	6,964
1997	41.7	7,139
1998	42.7	7,202
1999	44.0	7,337
2000	46.0	7,566
2001	46.9	7,617
2002 (prel)	48.0	7,714

Source: Organisation for Economic Co-operation and Development and International Monetary Fund.

Developing and former Eastern bloc nations borrow money from foreign banks and governments to finance transportation, power generation, schools, loans to local businesses, and other sorts of development projects. In 2001, their cumulative foreign debt shrunk to \$2.44 trillion.¹ (See Figure 1.)

More than half of the debt is owed to private, commercial lenders; the rest is owed to national governments, the World Bank, the International Monetary Fund (IMF), and regional development banks.²

Some 78 percent of the debt in 2001 was owed by middle-income nations, which typically pay market-based interest rates and borrow more heavily from commercial than official lenders.³ The global economic slowdown in 2001 made private banks more averse to risk and less inclined to lend to developing countries, as ratings agencies class some two thirds of developing countries as “speculative-grade” borrowers.⁴ New loans to developing nations from private banks fell to \$93 billion in 2001, a 25-percent drop from 2000.⁵

The IMF has proposed a Sovereign Debt Restructuring Mechanism (SDRM) as a bankruptcy process to streamline the restructuring of developing-country debt that would be similar to what is in place within many countries for companies and municipalities.⁶ This is intended for commercial debt, so it would be of most use in managing crises in middle-income nations, such as Argentina’s economic meltdown in 2001.⁷

While banks and creditor countries have stalled the SDRM, other initiatives are more relevant for low-income nations, which owed roughly 22 percent of outstanding debt in 2001.⁸ These nations rely heavily on special loans, some virtually interest-free, from the World Bank and other government agencies. Compared with other regions, sub-Saharan Africa and South Asia owe a greater share of their debt to official lenders.⁹ (See Figure 2.)

The total external debt of some nations is higher than they will be able to repay. This “debt overhang” deters foreign investment and drags down the economy, as governments fail to

meet people’s basic health and education needs.¹⁰ Zambia devoted more than 30 percent of its budget to debt repayments each year in the 1990s, for example, while spending roughly 10 percent on basic social services.¹¹

Starting in the late 1980s, through the Paris Club, creditor nations announced a series of special terms for poor nations struggling with high debt—offering longer repayment periods and canceling some debts.¹² Then in 1996 the Group of Seven industrial nations called on the World Bank and the IMF to administer a Heavily Indebted Poor Countries (HIPC) program, which was expanded in 1999, largely in response to pressure from a coalition of nongovernmental organizations called Jubilee 2000.¹³

Some 42 countries, mostly in Africa, can qualify for debt relief after they show a track record of reforms to promote macroeconomic stability and draw up a poverty reduction strategy in consultation with civil society groups.¹⁴ As of January 2003, six nations had completed the program, while another 21 had begun it.¹⁵

The HIPC relief is worth less than it appears on paper because much of the debt could never be repaid anyway.¹⁶ Many analysts have called for greater debt forgiveness.¹⁷ As corrupt governments have wasted or misappropriated money in the past, and as some of the poorest nations are now overwhelmed by the AIDS crisis, a key challenge for donors and borrowers will be ensuring that funds freed up by debt relief go into areas of urgent need, such as public health and primary education.¹⁸

Changes in the rules of world trade are needed to help nations service their debts. Poor nations get foreign currency to repay loans through trade, relying heavily on exports of agriculture and textiles, which remain protected in rich nations.¹⁹ The average person in a developing country selling into world markets confronts barriers that are roughly twice as high as those faced by counterparts in industrial nations.²⁰ In 2002, the U.N. Development Programme called on the World Trade Organization to open up its meetings to counter back-room deals made by a handful of wealthy nations that effectively limit developing nations’ power to set trade rules.²¹

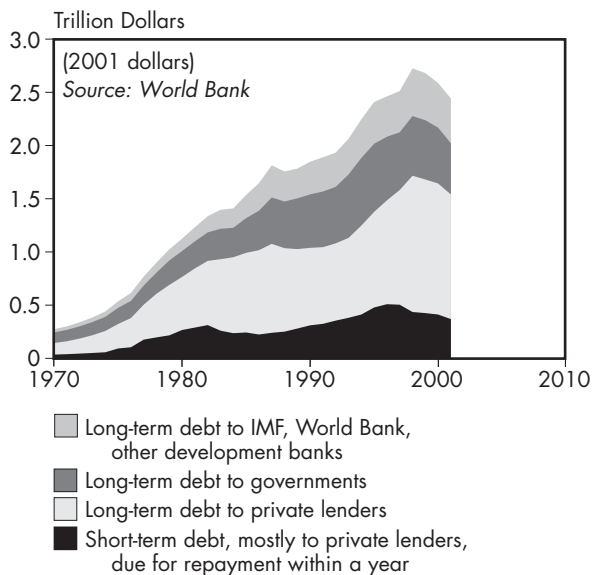


Figure 1: Foreign Debt of Developing and Former Eastern Bloc Nations, 1970–2001

Foreign Debt of Developing and Former Eastern Bloc Nations, 1970–2001

Year	Foreign Debt (trillion 2001 dollars)
1970	0.27
1971	0.30
1972	0.34
1973	0.38
1974	0.44
1975	0.54
1976	0.62
1977	0.77
1978	0.90
1979	1.03
1980	1.13
1981	1.23
1982	1.34
1983	1.40
1984	1.41
1985	1.54
1986	1.65
1987	1.81
1988	1.76
1989	1.78
1990	1.85
1991	1.89
1992	1.94
1993	2.07
1994	2.25
1995	2.40
1996	2.46
1997	2.51
1998	2.72
1999	2.68
2000	2.59
2001	2.44

Source: World Bank.

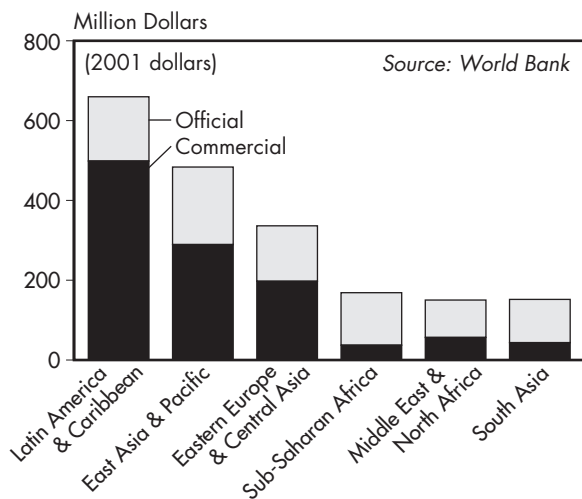


Figure 2: Long-term Foreign Debt Owed by Developing and Former Eastern Bloc Nations to Commercial and Official Lenders, by Region, 2001

Global advertising expenditures grew 0.6 percent in 2002 to \$444 billion; of this total, \$309 billion was spent on major media, including television, radio, and newspaper.¹ (See Figure 1.) This modest growth was almost fully driven by the United States, which at \$235 billion accounts for over half of the total advertising market.² In 2002, U.S. advertising grew by 1.7 percent, stimulated by an economic recovery and cyclical events like the Winter Olympics and the U.S. congressional elections—the latter

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generating \$1 billion in ads.³ Yet the worldwide increase followed a fall of 9.2 percent in 2001, which

was triggered by the U.S. recession, the financial market collapse, the Internet “bubble burst,” and terrorist attacks.⁴

In Japan, which is the second largest advertising market and buys 12 percent of major media advertising, spending fell 5 percent in 2002.⁵ In Germany, the third biggest market and the largest one in Europe, spending fell by 6 percent.⁶ In contrast, advertising in China, the seventh largest market, is growing quickly; it was unaffected by the downturn in 2001 and has jumped 14 percent over the past two years.⁷

The global average advertising spending per person for 2002 dropped slightly to \$71 (\$49 spent on major media), as increases in spending were matched by population growth.⁸ (See Figure 2.) Yet this figure masks a huge variation across countries. While major media ad spending stood at \$4 per person in China and \$282 per person in Japan, in the United States it was \$494 per person—10 times the global average.⁹ (See Figure 3.)

Advertising promotes consumer spending, which in its current form is harming environmental and human well-being. In 2001, for instance, 5 of the top 10 advertisers were car companies.¹⁰ And even while the economy stagnated that year, the global passenger car fleet grew to 523 million, with production of new cars reaching 40 million.¹¹ Cars burn vast quantities of oil—polluting the air, contributing to respiratory diseases, and stoking climate change.¹²

The pharmaceutical industry, the sixth largest global advertiser, spent \$2.5 billion on

television and print advertising in 2000 in the United States, directly targeting consumers and generating demand for drugs.¹³ While pharmaceuticals can help save lives, advertising can promote unnecessary use of expensive drugs.¹⁴ A recent survey of U.S. physicians found that 92 percent of patients requested an advertised drug from their doctors and that 47 percent of those doctors felt pressured to prescribe those drugs.¹⁵

Advertising has become pervasive in daily life and continues to expand into new realms. Increasingly, advertisers are marketing to children to shape consumption preferences early and to take advantage of the growing amount of money that people are spending on children, which hit \$405 billion in 2000.¹⁶ American children are bombarded with 40,000 television ads per year, up from 20,000 in the 1970s.¹⁷ Half of these encourage children to request unhealthy food and drinks.¹⁸

In addition, embedded ads, such as product placements in movies, can seriously influence children. In a recent study, researchers found that smoking in movies is strongly associated with youth smoking habits—as strongly as other social influences, such as parental or sibling smoking habits.¹⁹ U.S. advertising to children has spread to schools, where ads adorn walls, sporting equipment, and even educational programming.²⁰

To reduce children's exposure to marketing, several countries, including Denmark, Greece, and Belgium, restrict television advertising to children; Sweden and Norway totally ban it.²¹ Even full bans are only partly effective, however, because satellites can beam television ads from other countries into restricted markets.²²

Public interest groups are also working to reduce children's exposure to advertising and to teach children about marketing motives. In the United States, a campaign of the American Legacy Foundation known as The Truth uses controversial ads, education, and grassroots activism to challenge teens not to get manipulated by the tobacco industry's marketing into starting a lethal habit.²³

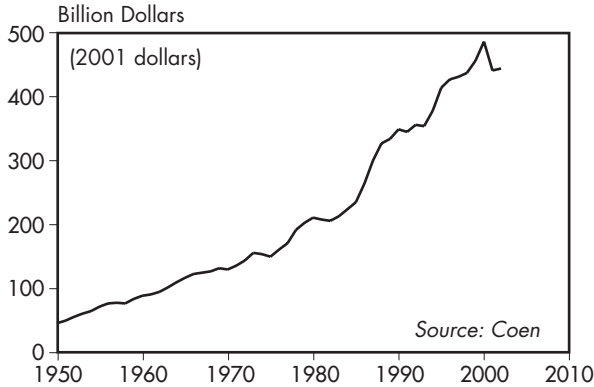


Figure 1: World Advertising Expenditures, 1950–2002

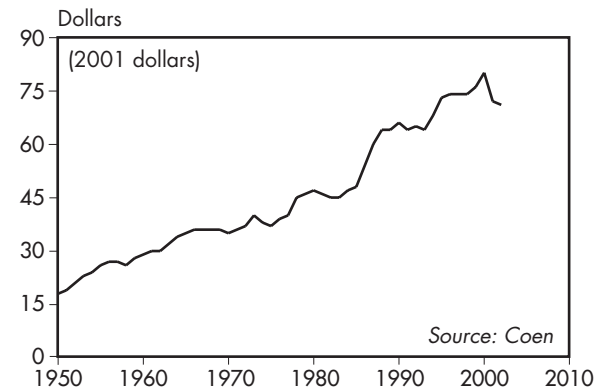


Figure 2: Advertising Expenditures Per Person, 1950–2002

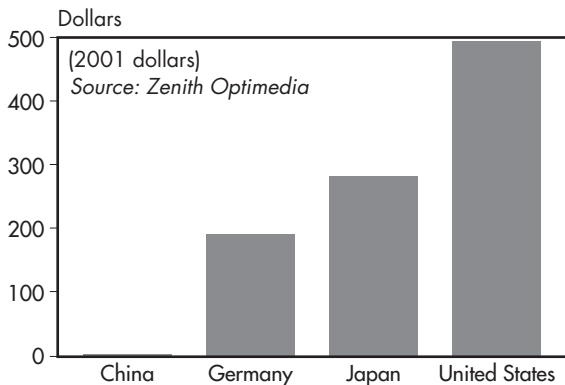


Figure 3: Major Media Advertising Per Person, Selected Countries, 2002

World Advertising Expenditures, 1950–2002

Year	Advertising Expenditures (bill. 2001 dollars)	Expenditures Per Person (2001 dollars)
1950	46	18
1955	72	26
1960	89	29
1965	117	35
1970	130	35
1971	136	36
1972	144	37
1973	156	40
1974	154	38
1975	150	37
1976	161	39
1977	171	40
1978	192	45
1979	203	46
1980	211	47
1981	208	46
1982	206	45
1983	213	45
1984	224	47
1985	235	48
1986	264	54
1987	300	60
1988	327	64
1989	334	64
1990	349	66
1991	345	64
1992	356	65
1993	354	64
1994	378	68
1995	414	73
1996	427	74
1997	431	74
1998	437	74
1999	456	76
2000	486	80
2001	441	72
2002 (prel)	444	71

Source: Coen.

International tourism increased 3 percent in 2002, to 715 million arrivals, according to preliminary estimates by the World Tourism Organization.¹ (See Figure 1.)

This better-than-expected growth came after one of the most difficult episodes in recent tourism history. In 2001, for the first time in nearly 20 years, international tourist arrivals actually declined, by 0.6 percent.² The drop reflected the impacts of both the September 11

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terrorist attacks in the United States and the global economic slowdown.³

Receipts from international tourism fell nearly 5 percent in 2001, to \$462 billion (in 2001 dollars).⁴ (See Figure 2.) (Receipt estimates for 2002 are not yet available.)

The industry is still reeling from these extensive losses. The World Travel & Tourism Council (WTTC) reports that global tourism employment was down nearly 2 percent in 2002, generating 3 million fewer jobs than two years earlier.⁵ And the world's airlines experienced near-zero growth in traffic in 2002, following what the International Air Transport Association has called the "worst year in the history of air transport."⁶

In 2001, the combination of lower passenger travel, a weak global economy, and, in some cases, overambitious expansion strategies contributed to net financial losses of \$12 billion for the world's airlines.⁷ Many carriers were forced to cut routes, lay off personnel, and restructure operations; in 2002, industry heavyweights US Airways and United Airlines both filed for bankruptcy.⁸ Analysts expect brighter news for the airline industry in 2003, the one-hundredth anniversary of aviation.⁹

If global conditions improve, the tourism industry may be well on its way to resuming its strong historic growth.¹⁰ Since 1950, international tourist arrivals have increased nearly 28-fold, growing at an average annual rate of 7 percent.¹¹

Europe remains the top destination—capturing 58 percent of arrivals in 2002—though its share of the world's tourists continues to fall from a high of 75 percent in 1964.¹² (See Figure 3.) France was the most visited country in

2002, followed by Spain, the United States, Italy, and China.¹³

For the first year ever, the share of the world's tourists visiting East Asia and the Pacific surpassed the portion visiting the Americas—reaching nearly 18 percent (up from less than 1 percent in 1950).¹⁴ Arrivals to Asia are expected to double within the next decade, and by 2020 the region could attract a quarter of all tourism traffic.¹⁵

In the past decade alone, China has risen from twelfth to fifth place on the list of most visited nations.¹⁶ And in 2001, it edged out the United Kingdom as the fifth highest earner of tourism receipts worldwide.¹⁷ By 2020, China is predicted to be the top international destination, attracting some 130 million visitors a year.¹⁸

Overall, tourism-related spending accounted for some \$4.2 trillion of global economic activity in 2002 and represented 12 percent of total world exports, according to WTTC.¹⁹ And despite the employment slowdown, the activity generated an estimated 199 million jobs—one in every 13 jobs worldwide.²⁰

The growing global dependence on tourism has its downside, however. On average, up to half of all tourism income in developing countries "leaks" out of the destination, with much of it going to industrial nations through foreign ownership of hotels and tour companies.²¹ And tourism poses a growing threat to the world's natural areas—from small islands to high peaks and the poles.²² Tourist transportation and infrastructure, as well as the sheer volume of visitors, can bring serious pollution and habitat destruction.²³

One promising new trend is "sustainable tourism"—environmentally and socially conscious travel that can help protect natural assets as well as generate local income.²⁴ The rise in "green" hotels and voluntary codes of conduct for tour operators may lessen the environmental effects of the tourism boom.²⁵ And ongoing efforts to create a Sustainable Tourism Stewardship Council may help the industry develop new international standards for tourism certification.²⁶



Figure 1: International Tourist Arrivals, 1950–2002



Figure 2: International Tourism Receipts, 1950–2001

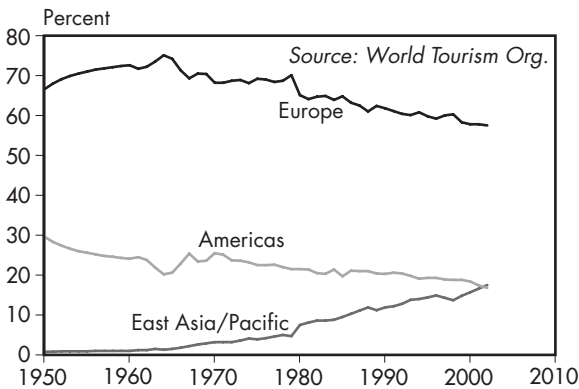


Figure 3: Share of International Tourist Arrivals by Region, 1950–2002

International Tourist Arrivals and Global Tourism Receipts, 1950–2002

Year	Arrivals (million)	Receipts (bill. 2001 dollars)
1950	25	13
1955	47	25
1960	69	34
1965	113	53
1970	166	67
1971	179	75
1972	189	85
1973	199	101
1974	206	101
1975	222	111
1976	229	115
1977	249	135
1978	267	156
1979	277	176
1980	286	202
1981	287	172
1982	286	167
1983	290	163
1984	316	173
1985	327	175
1986	339	208
1987	364	249
1988	395	279
1989	426	291
1990	457	333
1991	463	338
1992	501	376
1993	516	375
1994	550	405
1995	565	453
1996	597	478
1997	618	472
1998	636	468
1999	652	477
2000	696	486
2001	693	462
2002 (prel)	715	—

Source: World Tourism Organization.

Between 1978 and 2002, the number of World Heritage Sites worldwide increased from 12 to 735.¹ (See Figure 1.) The global total now stands at 730, as several adjacent properties have been merged.²

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) confers World Heritage status on cultural or natural sites considered to be of “outstanding value to humanity.”³ The current list includes 563 cul-

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tural sites (buildings, monuments, and properties with aesthetic, anthropological, archaeological, ethnological, historical, or scientific value); 144 natural sites (areas with scientific, conservation, or aesthetic value; outstanding physical, biological, and geological formations; or habitats of threatened plant or animal species); and 23 “mixed” sites.⁴

The properties are located in 125 countries on six continents.⁵ Europe, with its heavy concentration of monuments and religious architecture, is home to nearly half of the properties recognized by UNESCO (323 sites), while Asia has nearly a quarter (163 sites).⁶ (See Figure 2.) Spain and Italy contain the most individual properties, with at least 35 each, followed by China, France, and Germany.⁷ (See Figure 3.)

The idea of protecting the world’s shared heritage emerged after World War I in response to growing concern about threats to important cultural and natural landmarks.⁸ UNESCO launched the first truly global campaign to save cultural heritage in 1960, when 50 countries raised \$80 million to dismantle and rescue the ancient Egyptian temples of Abu Simbel from flooding due to construction of the Aswan High Dam.⁹ Other early campaigns focused on conserving Venice in Italy, Pakistan’s Bronze Age city of Moenjodaro, and the Buddhist temples of Borobudur in Indonesia.¹⁰

The formal World Heritage List was established in 1972 following adoption of the Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention).¹¹ The agreement’s 175 signatory countries have pledged to collectively protect natural and cultural areas of “outstand-

ing universal value” that transcend national boundaries and belong to all of humanity.¹²

Earning World Heritage status can be an important way to attract tourist dollars and other resources to national parks, historic landmarks, and other properties. Member countries must individually nominate sites for inclusion on the list. Once a site is approved, governments are encouraged to report on the progress of conservation and to raise public awareness about the property. But not all nominees make the cut: many countries face instability or lack financial or other support, which prevents them from meeting the strict listing requirements.¹³ Nevertheless, UNESCO aims to increase the number and diversity of sites, particularly in Africa.¹⁴

Some existing sites already risk deterioration or disappearance. UNESCO’s List of World Heritage in Danger now includes 33 properties, most of which are in Africa.¹⁵ They face a wide range of threats—from armed conflict to abandonment, rampant urban or tourist development, and changes in land use or ownership.¹⁶

Many properties also face environmental dangers, including pollution, poaching, flooding, and natural disasters like earthquakes, landslides, and volcanic eruptions.¹⁷ Mali’s great mosques of Timbuktu are increasingly at risk of encroachment by desert sands, while mining operations threaten both Yellowstone National Park in the United States and the Mount Nimba Strict Nature Reserve spanning Guinea and Côte d’Ivoire.¹⁸

To date, UNESCO-sponsored campaigns have raised more than \$1.5 billion for site preservation worldwide.¹⁹ The organization provides technical assistance and professional training to treaty member countries, as well as emergency assistance to endangered sites.²⁰

The world’s natural heritage got an additional boost in November 2002 when Conservation International in the United States and the United Nations Foundation announced a three-year, \$15-million partnership to support conservation efforts in new and existing properties. Sixteen of the world’s 25 so-called biodiversity hotspots are also designated as World Heritage Sites.²¹

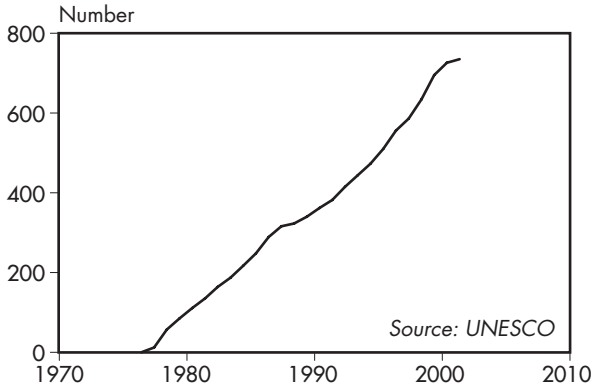


Figure 1: World Heritage Sites, 1978–2002

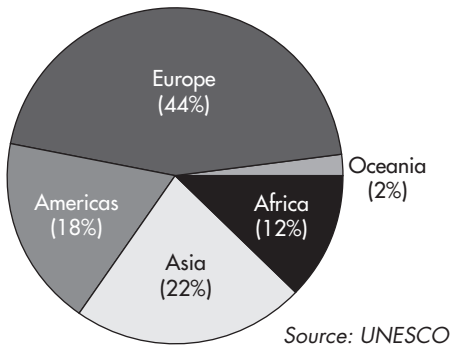


Figure 2: Share of World Heritage Sites by Region, 2002

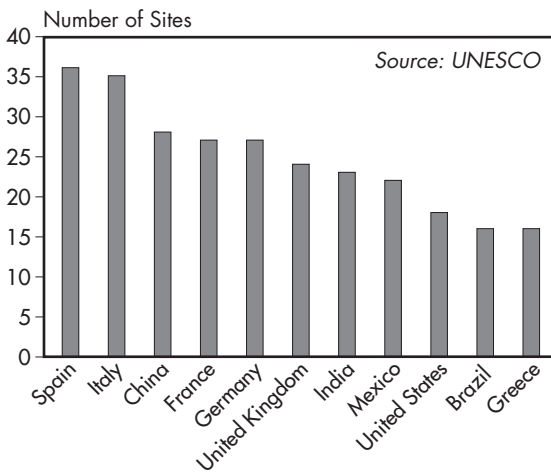


Figure 3: Top Locations for World Heritage Sites, by Country

World Heritage Sites,
1978–2002

Year	Sites (cumulative number)
1978	12
1979	57
1980	85
1981	111
1982	135
1983	164
1984	187
1985	217
1986	248
1987	289
1988	316
1989	323
1990	340
1991	362
1992	382
1993	415
1994	444
1995	473
1996	510
1997	556
1998	586
1999	634
2000	695
2001	726
2002	735

Source: UNESCO.

Transportation and Communications Trends



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Vehicle Production Inches Up
Bicycle Production Seesaws
Communications Networks Expand
Semiconductor Sales Rebound Slightly

Global passenger car production grew 2 percent in 2002, to 40.6 million units.¹ This is still slightly below the 2000 peak output of 41.1 million.² Since 1950, annual car production has grown fivefold.³ (See Figure 1.) Production of sport utility vehicles and other “light trucks” reached a record 15.8 million in 2002, 6 percent more than in 2001.⁴ Revised estimates show the global passenger car fleet reaching 531 million in 2002.⁵ (See Figure 2.) The United States has one quarter of the cars in the world.⁶

Reflecting continued overcapacity in the industry, passenger car production outpaced sales by almost 2 million vehicles, or more than 5 percent.⁷ But light trucks continued to be popular, outrunning production in 2002 by more than 1 million (almost 9 percent).⁸ Once primarily used for hauling loads, light trucks are now heavily marketed as passenger vehicles. But even more so than cars, they are increasingly important contributors to air pollution and climate change. In the United States, model-year 2001 light trucks emitted 2.4 times more smog-forming pollutants and 1.4 times more carbon than passenger cars.⁹

Driving a gasoline-powered car accounts for about 68 percent of the greenhouse gases emitted over the life of the vehicle, but producing and distributing the fuel on which it runs accounts for another 21 percent, while manufacturing the car itself contributes the rest.¹⁰

Automobile carbon emissions could be reduced significantly by boosting fuel efficiency. Yet fuel economy has remained flat since 1990 in the United States, after substantial improvements since the early 1970s.¹¹ Efforts to raise mandated fuel efficiency standards failed in the mid-1990s and again in 2002.¹² Carmakers exploit exemptions and loopholes in existing standards, and the Bush administration is considering tax measures that would provide more incentive for buyers to choose the biggest gas-guzzlers.¹³

In 1970, Americans drove some 80 million cars close to 1 trillion miles (almost 1.6 trillion kilometers), burning 5.25 million barrels of fuel per day (mb/d) and emitting 193 million tons of carbon.¹⁴ By 2000, there were about 128 mil-

lion cars—60 percent more. They traveled 2.3 trillion miles (a growth of 146 percent), consumed 8.2 mb/d of fuel (up 56 percent), and emitted 302 million tons of carbon (also 56 percent more).¹⁵ (See Figure 3.)

In the rest of the world, car density relative to population is much lower than in the United States. In Western Europe and Japan, it is currently comparable to the level the United States reached in the early 1970s; in Eastern Europe, it is similar to that in the 1930s; and in other regions it is even lower.¹⁶

People outside the United States also use their cars less than Americans. For instance, the average car in the United States travels 10 percent more per year than a car in the United Kingdom, about 50 percent more than one in Germany, and almost 200 percent more than a car in Japan.¹⁷ And Americans drive less fuel-efficient cars, so these figures understate the national differences in gasoline used for driving.¹⁸

The United States consumed 43 percent of the 19.1 mb/d of world gasoline use for all transportation purposes in 1999.¹⁹ (This number overstates the U.S. share of road fuel use, however, because it does not include diesel fuels, which are popular in Europe.)²⁰ All in all, the carbon emissions of U.S. automobiles are roughly equivalent to those of the entire Japanese economy—the world’s fourth-largest carbon emitter.²¹

The leaders in fuel economy are Honda, Hyundai, Volkswagen, and Subaru. The U.S. “Big Three,” by contrast—General Motors, Ford, and Daimler-Chrysler—are among the laggards.²² One analysis of the six largest carmakers also finds that the Japanese firms Honda, Toyota, and Nissan have a “cleaner” record with regard to smog-forming pollutants than the Big Three.²³

To date, only Honda and Toyota have introduced “hybrid electric” cars (in which electric power supplements the internal combustion engine, which lowers fuel intake and pollutants).²⁴ Vehicles running on all different types of alternative power currently account for only a tiny share of the total car fleet. In the United States, fewer than 380,000 such vehicles were on the roads in 2001.²⁵

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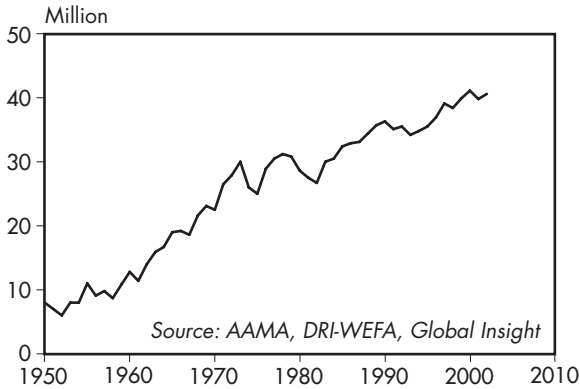


Figure 1: World Automobile Production, 1950–2002

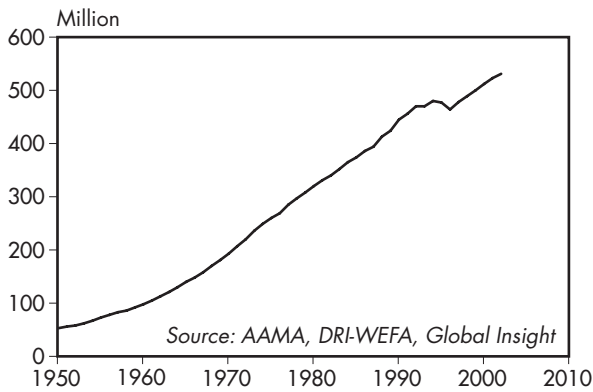


Figure 2: World Passenger Car Fleet, 1950–2002

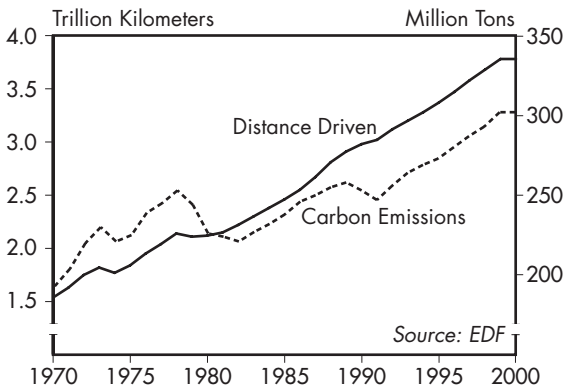


Figure 3: Distance Driven and Carbon Emitted by U.S. Automobiles, 1970–2000

World Automobile Production, 1950–2002

Year	Production (million)
1950	8.0
1955	11.0
1960	12.8
1965	19.0
1970	22.5
1971	26.5
1972	27.9
1973	30.0
1974	26.0
1975	25.0
1976	28.9
1977	30.5
1978	31.2
1979	30.8
1980	28.6
1981	27.5
1982	26.7
1983	30.0
1984	30.5
1985	32.4
1986	32.9
1987	33.1
1988	34.4
1989	35.7
1990	36.3
1991	35.1
1992	35.5
1993	34.2
1994	34.8
1995	35.5
1996	36.9
1997	39.1
1998	38.4
1999	39.9
2000	41.1
2001	39.8
2002 (prel)	40.6

Source: DRI-WEFA, American Automobile Manufacturers Association, and Global Insight.

Global production of bicycles fell by some 7 percent in 2001, to 97 million units, as the production oscillations of the 1990s continued into the new century.¹ (See Figure 1.) And although production data are not yet available for 2002, preliminary indications suggest that the industry's sluggish performance continued.²

The fluctuating market is more a reflection of difficulties in inventory management due to globalization of the bicycle industry than it is of changes in demand. As production concentrates in Asia, sellers in distant markets, especially in Europe and the United States, must order stock based on estimates of the strength of their own markets six months or more in advance.³ Retailers often miscalculate, leaving themselves with burgeoning inventories that are later unloaded, depressing new orders.⁴ The result is a seesaw global production cycle in the face of flat global demand.

In the United States, for example, domestic production in 2001 continued its decade-long decline, and imports fell by 19 percent over 2000, yet robust sales were supported by drawing down the millions of bicycles in stock around the country.⁵

The decade-long trend in concentration of production is evident in several ways. Bicycle factories are increasingly rare in the United States, Mexico, and the European Union, as manufacturers move to countries with lower production costs, including Viet Nam and several in Eastern Europe.⁶

China is another major site for new bicycle factories, which has helped consolidate that country's grip on global production. In 2001, China produced 53 percent of the world's bicycles, perhaps the first time ever that one nation has supplied more than half of global output.⁷ (See Figure 2.) Increasingly, these bikes are headed overseas: Chinese exports more than doubled between 1997 and 2001, from 14 million units to nearly 35 million.⁸ But China also remains the world's leading user of bicycles, despite a steady decline in bicycle use over the past decade.⁹

Chinese inroads into the global market are especially impressive given the barriers to their

bicycles that exist in many countries. The European Union and Canada both have stiff import duties on Chinese bikes.¹⁰ The United States, in contrast, does not levy such "dumping" duties.¹¹ So some 40 percent of Chinese bike exports were shipped to the United States in 2001, accounting for 87 percent of bicycles brought into the country.¹²

The sluggish bicycle market stands in contrast to scattered local interest in promoting more diverse urban transportation systems, including an expanded role for bicycles. The disadvantages of car-centered transportation, including air pollution, sprawl, and congestion, have prompted many cities to rethink their transportation priorities. Programs that restrict the use of private cars for a day are on the rise; some 2,000–3,000 "car-free days" of varying levels of comprehensiveness have been held in the past 10 years.¹³ The residents of Bogotá, Colombia, voted overwhelmingly to make that city's February 2000 car-free-day experiment an annual event, and in 2002 eight other Colombian cities restricted car use for a day.¹⁴

Such initiatives help citizens imagine a transportation system with options other than cars. Many cities build on this conceptual shift by providing bikeways, the physical space needed to make cycling safe and enjoyable. Bogotá has a network of hundreds of kilometers of bikeways under construction, and Santiago's Urban Transport Plan calls for building some 1,000 kilometers of bikeways.¹⁵

Done well, the bikeway strategy can be extremely successful, as experience in Europe demonstrates. The Netherlands has doubled the length of its network of bikeways in the past 20 years, and Germany has tripled its network.¹⁶ Cycling accounts for some 12 percent of all trips in Germany, and for some 27 percent in the Netherlands, compared with less than 1 percent in the United States, where bicycle infrastructure is much less extensive and less sophisticated.¹⁷ In addition, there are about four times as many cycling fatalities per kilometer traveled in the United States as in Germany or the Netherlands.¹⁸

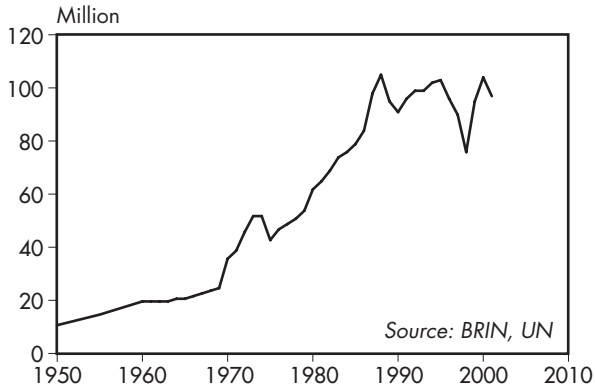


Figure 1: World Bicycle Production, 1950–2001

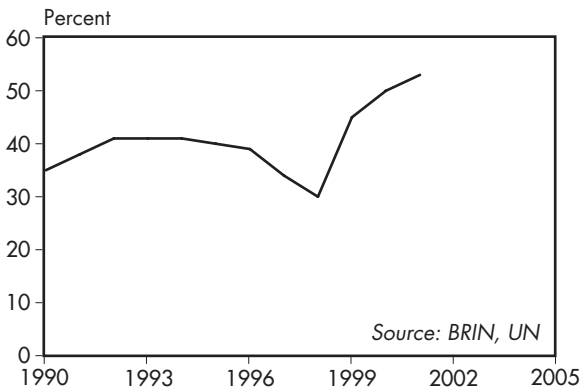


Figure 2: Chinese Bicycle Production as a Share of World Production, 1990–2001

World Bicycle Production, 1950–2001

Year	Production (million)
1950	11
1955	15
1960	20
1965	21
1970	36
1971	39
1972	46
1973	52
1974	52
1975	43
1976	47
1977	49
1978	51
1979	54
1980	62
1981	65
1982	69
1983	74
1984	76
1985	79
1986	84
1987	98
1988	105
1989	95
1990	91
1991	96
1992	99
1993	99
1994	102
1995	103
1996	96
1997	90
1998	76
1999	95
2000	104
2001	97

Source: *Bicycle Retailer and Industry News* and United Nations.

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Both mobile phones and the Internet attracted new users at double-digit rates in 2002, albeit more slowly than in the 1990s. The number of mobile or cellular phone subscribers worldwide in 2002 topped 1.15 billion, an increase of 21 percent over 2001.¹ (See Figure 1.) For the first time, mobile phones outnumbered fixed-line phone connections (1.05 billion).² At the same time, use of the Internet expanded, thanks in part to a 16.5-percent increase in host computers in 2002 to 171.6 million, drawing more than 600 million people online regularly.³ (See Figure 2.)

Within just one decade, the ranks of people communicating by wireless phones and wired computers have swelled significantly. In 1992, only one in 237 people worldwide used a mobile phone, and one in 778 used the Internet; by 2002, the numbers had soared to one in 5 and one in 10, respectively.⁴ Today, well over 90 percent of all nations have local cell phone and Internet service, whereas in 1992, a person could use a cell phone in only one third of all countries and hook up to the Internet through a local number in just 19 percent.⁵

By linking computers with phones, the Internet sped the convergence of communications and computing technologies in the 1990s.⁶ Now, as mobile phones proliferate, more people are making wireless connections to the Internet.⁷ Since 2002, a growing number of U.S. cities have set up systems in parks and public spaces that give free Internet access to people with wireless modems in their laptop computers.⁸ In Europe, more people send and receive short text messages with their cell phones than use the Internet from personal computers.⁹

Cell phones have helped bridge the telephonic divide between rich and poor. Building towers for them is cheaper than stringing copper wires for fixed-line phones, so start-up mobile services can recoup their investments and expand their coverage more quickly. As the average price of mobile phones has dropped by nearly 10 percent a year, it has fallen within reach of more people.¹⁰ Between 1992 and 2001, phone penetration—the number of fixed lines and of mobiles per 100 people—accelerated

in developing nations.¹¹ (See Figure 3.)

Gaps in phone access have closed more quickly in some countries than others, with striking differences among the nations in transition from planned to market economies. Central European nations, quick to invite mobile competition, saw dramatic gains in phone penetration in the 1990s; Hungary, for instance, went from 9.6 phone connections per 100 people in 1990 to 67.4 per 100 in 2000.¹² During the same period, in former Soviet republics in Central Asia, where the state still controls most telecom services, phone penetration did not grow beyond 20 per 100.¹³

Mobile service has dramatically increased access to phones in Africa. Uganda, the one nation where all three of Africa's leading cellular companies compete, in 1999 became the first country in that continent to have more mobile than fixed-line customers.¹⁴ Some 30 other African nations have followed, as more people have hooked into the phone network in a few years of cellular expansion than in all the decades since independence.¹⁵ Mobiles outnumber fixed lines in Africa today at a higher ratio than on any other continent.¹⁶

A greater gap separates those with and without Internet access, but this digital divide is also narrowing. In 2001, the industrial world had 41 Internet users per 100 people, whereas developing nations had 2.3 per 100—still a 17 to 1 ratio, but much better than the 40 to 1 ratio in 1995.¹⁷ By linking rural farmers to market information, craftworkers to customers, patients to doctors, and students to teachers, the Internet can aid economic development.

Cheap computers with nonproprietary software, designed to be shared at public libraries, cyber cafes, and telecenters, could bring the Internet to even more people. Indian scientists have built a handheld "Simputer"—short for Simple, Inexpensive, Multilingual Computer—for poor, rural users that is expected to reach the market in 2003.¹⁸ While the computer itself will cost about \$200, people will be able to rent time on one—for instance, to check commodity prices or consult doctors—and to store their own data on \$1–2 cards.¹⁹

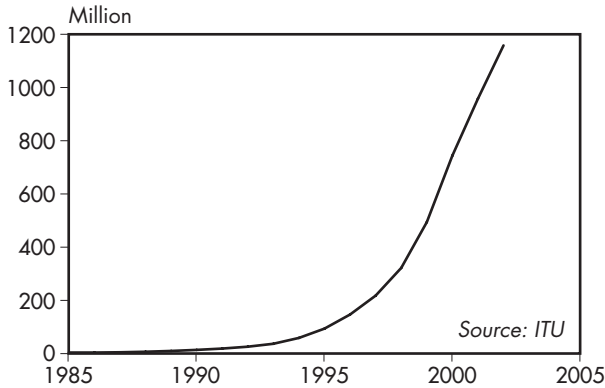


Figure 1: Cellular Phone Subscribers Worldwide, 1985–2002

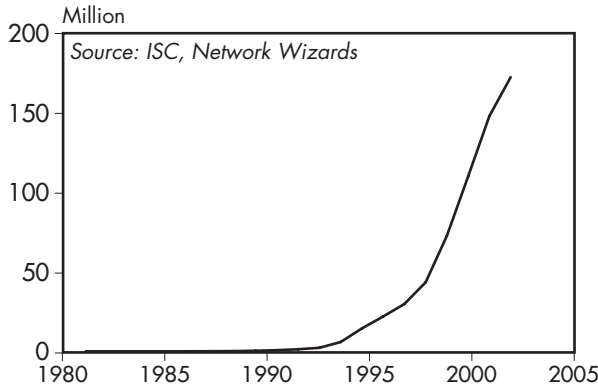


Figure 2: Internet Host Computers, 1981–2002

Cellular Phone Subscribers and Internet Host Computers Worldwide, 1985–2002

Year	Cellular Phone Subscribers (million)	Internet Host Computers (number)
1985	1	2,308
1986	1	5,089
1987	2	28,174
1988	4	80,000
1989	7	159,000
1990	11	376,000
1991	16	727,000
1992	23	1,313,000
1993	34	2,170,000
1994	56	5,846,000
1995	91	14,352,000
1996	144	21,819,000
1997	215	29,670,000
1998	319	43,230,000
1999	491	72,398,092
2000	741	109,574,429
2001	955	147,344,723
2002	1,155	171,638,297

Source: International Telecommunication Union, Internet Software Consortium, and Network Wizards.

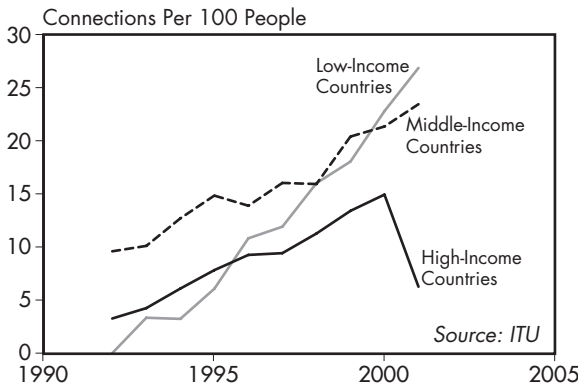


Figure 3: Annual Growth Rate in Phone Connections (Cellular and Fixed-Line) by Income Level of Country, 1992–2001

Sales of semiconductors, the brains behind modern electronics, rose in 2002 after the largest crash in nearly 50 years of semiconductor manufacturing.¹ (See Figure 1.) During 2000, semiconductor sales surged from \$150 billion to \$209 billion (in 2001 dollars), setting the record for the largest one-year rise in sales and the strongest sales ever.² The following year provided the antithesis: the largest one-year drop in history to a level just below that in 1996—\$139 billion. Sales remained virtually stagnant in 2002, with a gain of only \$500 million.³

On a decadal time scale, however, the semiconductor industry is growing. From 1970 to 2002, the average annual growth for the industry was 9 percent, and during the 1980s and 1990s the industry grew 1.8 and then 2.8 times faster than the global economy.⁴ Despite continued demand for its products, the industry has collapsed four times in its history: a crash of \$7.6 billion in 1985, of \$16.6 billion in 1996, of \$14.1 billion in 1998 during the Asian financial crisis, and of \$70.3 billion in 2001.⁵

A combination of factors led to the recent losses, most notably the dot-com bust in early 2000 and a global recession that picked up steam mid-2001.⁶ Some analysts also blame an inventory glut spurred by poor forecasting, with semiconductor (chip) manufacturers overproducing to gain nonexistent market share.⁷

The 2002 growth was led solely by the Asia-Pacific region (excluding Japan), where the market grew by 31 percent.⁸ (See Figure 2.) China continues to be a focus for chip makers.⁹ The International Expo Group forecasts the Chinese market to reach almost 9 percent of world semiconductor sales in 2003, making it the second-largest market in the world.¹⁰ Sales in the Americas, Europe, and Japan all continued to decline in 2002.¹¹

Although chips are bought around the world, production is primarily confined to East Asia, Europe, and North America. A 1999 survey of U.S.-based companies found that 59 percent of their employees were located in the United States, 33 percent in Asia, 6 percent in Europe, and 2 percent in Latin America.¹²

To avoid the cost and liability of a \$3–5 billion fabrication facility, most semiconductor firms outsource some or all of their production to the “Big Three” foundries—Taiwan Semiconductor Manufacturing Company, United Microelectronics Corporation in Taiwan, and Chartered in Singapore.¹³ Major firms are currently outsourcing fewer products, fighting to keep their own plants at full capacity, although AMD and Motorola indicate that in a market upswing they plan to outsource 25 percent and 50 percent of their production, respectively.¹⁴

Semiconductors undoubtedly have positive environmental results for society, such as the ability to telecommute and the heightened efficiency of industrial processes. Yet issues surrounding production and disposal, as well as the health of production workers, cloud this industry’s sleek image.¹⁵

According to a recent study, the negative environmental impacts of high-tech are manifest to a greater degree in the production phase of a chip’s life-cycle; this contrasts considerably with a consumer product like an automobile, where the major environmental impacts arise in the use phase.¹⁶ The total weight of fossil fuels and chemicals used to produce a 2-gram DRAM, or memory chip, is 630 times the weight of the chip itself, pointing to the existence of a secondary materials stream.¹⁷ Over its life cycle, which includes both production and use, this 2-gram chip requires 1,600 grams of fossil fuels, 72 grams of chemicals, 32,000 grams of water, and 700 grams of harmless elemental gases during its life.¹⁸

Another environmental problem is disposal, which is compounded by the complexity of the devices and their short-term usefulness. In the past, an average computer lasted four to five years; the trend today is retirement after just two years.¹⁹ One study predicts greater recycling of this electronic waste (e-waste), but another study recently exposed toxic e-waste recycling facilities in China and India and estimated that 50–80 percent of e-waste generated in the United States is exported for recycling.²⁰

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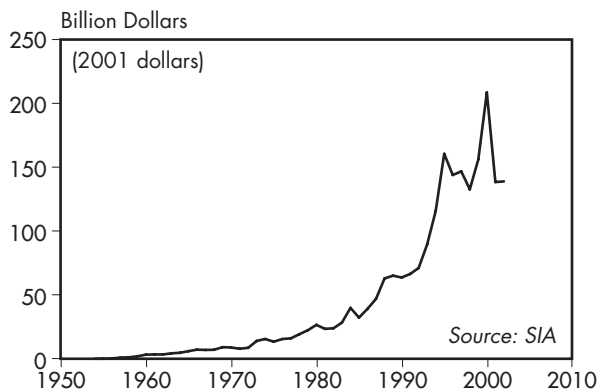


Figure 1: World Semiconductor Sales, 1954-2002

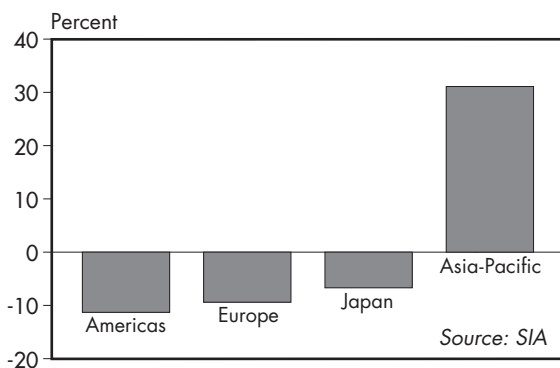


Figure 2: Regional Breakdown of Semiconductor Sales, 2002

World Semiconductor Sales, 1954-2002

Year	Sales (billion 2001 dollars)
1954	0.03
1960	3.20
1965	5.98
1970	8.85
1971	7.89
1972	8.60
1973	14.00
1974	15.54
1975	13.39
1976	15.52
1977	16.04
1978	19.28
1979	22.41
1980	26.66
1981	23.51
1982	23.95
1983	28.44
1984	39.98
1985	32.37
1986	39.23
1987	47.11
1988	63.16
1989	65.31
1990	63.87
1991	66.63
1992	71.37
1993	89.93
1994	116.13
1995	161.06
1996	144.43
1997	147.25
1998	133.17
1999	156.67
2000	209.24
2001	138.90
2002 (prel)	139.40

Source: Semiconductor Industry Association.

Health and Social Trends



JHU/CCP

Population Growth Slows
HIV/AIDS Pandemic Spreads Further
Cigarette Production Dips Slightly

Between 2001 and 2002, births exceeded deaths by 74 million, pushing world population over 6.2 billion.¹ (See Figure 1.) Last year's growth of 1.18 percent was the lowest since rates peaked above 2 percent in the mid-1960s.² With a larger population growing at a slower rate, the number of people added to the planet annually has in fact remained about the same, and the human family has more than doubled since 1960.³

Although deaths from AIDS and lower than expected fertility prompted the United Nations

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to reduce its global population projections—to 8.9 billion people by 2050, not 9.3 billion—the 49 poorest

countries in the world still have populations that are increasing at 2.4 percent per year, nearly 10 times the 0.25 percent annual growth in industrial nations.⁴ All the countries with the highest birth rates are among the world's poorest. (See Figure 2.)

Population growth is slowest in nations that moved from Communist rule in the 1990s, as higher mortality and higher emigration followed the collapse of economies. A growing gap in life expectancy divides Western Europe, where only 10 percent live below the poverty line, from Central and Eastern Europe and the former Soviet Union, where the share of the people living on less than \$4 a day skyrocketed from 3.3 percent in 1988 to 46 percent—nearly half the populace—by the end of the 1990s.⁵

Sharp declines in birth rates in a few populous nations are largely responsible for the slower growth of world numbers since the late 1960s. In Indonesia, the average number of children born to each woman in 1950–55 was 5.5; by 1995–2000, the figure had fallen to 2.6.⁶ Over the same period, fertility fell in Brazil from 6.2 to 2.3 children.⁷ By 2000, fertility had dropped below the replacement level of 2.1 children per woman in 17 nations in the developing world, including China.⁸

Lower fertility and slower population growth have been linked, since 1970, with economic development in Brazil, Mexico, and several East Asian nations.⁹ With better health care, death rates declined. And with better access to contraceptives, people had fewer chil-

dren and more women could work outside the home. A demographic window of opportunity for development opened, with a large group of working-age people supporting relatively fewer dependents—both older and younger.¹⁰

The labor force in Indonesia, Singapore, South Korea, Taiwan, and Thailand grew more rapidly than total population by about 25 percent a year between 1960 and 1990—a demographic bonus that boosted per capita income by 0.8 percent a year.¹¹ Similarly, declining fertility in Brazil increased per capita income by 0.7 percent annually.¹² With a smaller share of the population in school, countries could raise spending per child. Analysts credit the East Asian “economic miracle” to public investments made in education, health care, and opportunities for women.¹³

Population growth is increasingly concentrated in cities. As the pace of growth in cities has outstripped that of rural areas for more than a century, the share of the world living in urban areas has grown steadily—from 10 percent in 1900 to 30 percent in 1950 to nearly 48 percent in 2001.¹⁴ The United Nations estimates that some 2 billion people will be added to world population between 2000 and 2030—nearly all of them in urban areas of the developing world.¹⁵ In this “medium-growth” scenario, the urban share of world population will pass 50 percent in 2007 and top 60 percent by 2030.¹⁶ (See Figure 3.)

As population swells in urban centers of poor nations and wanes in some richer nations, more people are likely to migrate. The United States is the only industrial nation with a fertility rate still above replacement level, partly due to immigrants.¹⁷ In Japan, whose population is aging faster than any other nation's, the average age is expected to rise from 41 to 53 between 2000 and 2050 as the population contracts by 14 percent.¹⁸ Populations are also expected to age and shrink throughout Europe, where concern about the strain on pension and health care systems is mounting at the same time that rising numbers of migrants face an anti-immigrant backlash.¹⁹

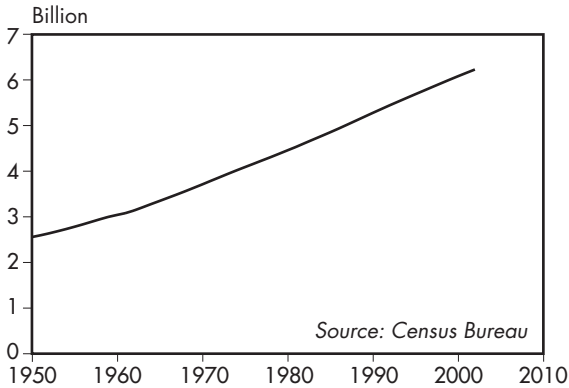


Figure 1: World Population, 1950–2002

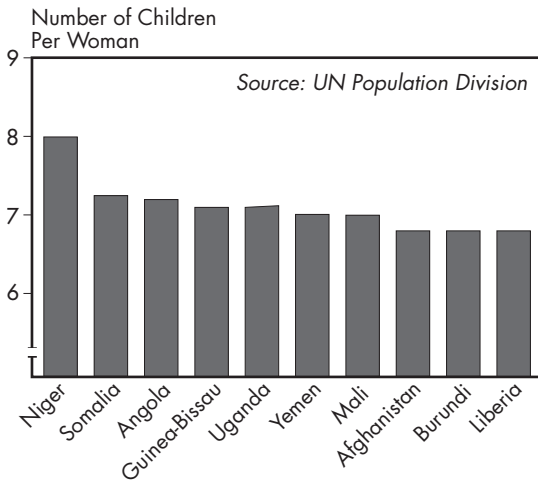


Figure 2: Countries with the Highest Fertility Levels, 2000–05

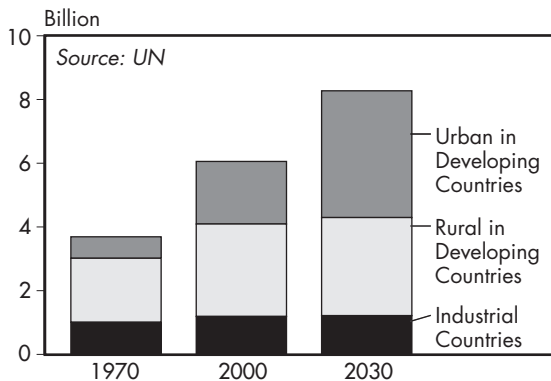


Figure 3: Urban and Rural Population, 1970 and 2000, with Projections for 2030

World Population, Total and Annual Addition, 1950–2002

Year	Total ¹ (billion)	Annual Addition (million)
1950	2.555	38
1955	2.780	53
1960	3.040	41
1965	3.346	70
1970	3.708	78
1971	3.786	77
1972	3.862	76
1973	3.939	76
1974	4.014	73
1975	4.087	72
1976	4.159	72
1977	4.232	72
1978	4.304	75
1979	4.379	76
1980	4.455	76
1981	4.530	80
1982	4.611	80
1983	4.691	79
1984	4.770	80
1985	4.850	82
1986	4.932	85
1987	5.017	86
1988	5.103	86
1989	5.189	87
1990	5.275	84
1991	5.359	84
1992	5.443	81
1993	5.524	80
1994	5.605	81
1995	5.685	79
1996	5.764	80
1997	5.844	79
1998	5.923	78
1999	6.002	77
2000	6.079	75
2001	6.154	74
2002 (prel)	6.228	74

¹Total at mid-year.

Source: U.S. Bureau of the Census.

The number of people living with HIV/AIDS rose to 42 million at the end of 2002.¹ Five million people became infected with HIV in 2002 (see Figure 1), and another 3.1 million died of AIDS-related causes.² (See Figure 2.)

For the first time, women account for half the people living with HIV/AIDS.³ Heterosexual transmission, particularly in Africa and the Caribbean, is the primary cause of infection among women, who are two to four times more likely than men to become infected during unprotected vaginal sex.⁴

Women's biological vulnerability—due to a large surface area of reproductive tissue and high virus concentrations in infected semen—is compounded by economic and social inequities. Women who are economically dependent on

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husbands or sexual partners have little control over sexual relations and condom use. Social taboos prevent women from learning about reproductive health, while the stigma associated with sexually transmitted infections is a barrier against seeking care.⁵ Young women risk contracting HIV from older partners, which explains large differences in HIV prevalence between teenaged males and females in many countries.⁶

In sub-Saharan Africa, home to 70 percent of the world's HIV-positive people, AIDS is the leading cause of death.⁷ In 2002, average life expectancy in 16 African nations was at least 10 years lower than it would have been without AIDS.⁸ HIV/AIDS is also exacerbating Africa's food crisis, threatening about 38 million people with starvation.⁹ The epidemic has reduced the number of agricultural workers and has unraveled social safety nets as families sell off assets to pay for medical or funeral expenses. For the poor without access to antiretroviral therapies, good nutrition is all that can ward off illness and early death. When this is also lost, weakened immune systems become susceptible to tuberculosis, malaria, and other infections.¹⁰

Though Africa carries the greatest burden of disease, the epidemic is growing fastest in Eastern Europe and Central Asia, where it is linked to intravenous drug use, high unemployment, and crumbling public health facilities. In Rus-

sia, up to 90 percent of registered infections are due to drug use.¹¹ High rates of sexually transmitted infections in the region indicate that heterosexual transmission could spread HIV into the wider population, as seen in Ukraine and Belarus.¹² In the Baltic states, overcrowded prisons and juvenile justice institutions serve as breeding grounds for the virus.¹³

Another emerging AIDS hotspot is Asia, where low national prevalence levels in populous nations mask the magnitude of localized infection. Nearly 4 million people are infected in India, and the epidemic has hit the general population in several states.¹⁴ In China, people in poor rural communities who participated in blood-selling programs in the 1990s have become concentrated pockets of HIV-positive villagers with limited access to any kind of care.¹⁵ In all, China reports an estimated 1 million infections, with drug use and heterosexual transmission continuing the spread.¹⁶

Although AIDS-related mortality has fallen dramatically in high-income countries since antiretroviral treatment became widespread in 1996, only 4 percent of those who need treatment in low- and middle-income countries receive it.¹⁷ (See Figure 3.) The price of antiretrovirals has fallen dramatically, from \$10,000–12,000 a year per person in early 2000 to \$350 by December 2001.¹⁸ The world's poorest, however, cannot afford even this.

Yet some progress has been made in making access to treatment more equitable. In 2002, Botswana became the first African nation to adopt a policy of universal access to treatment.¹⁹ The biggest strides have been made in Latin America and the Caribbean: Brazil, Argentina, Costa Rica, Cuba, Uruguay, Honduras, and Panama are among the countries providing free or subsidized treatment.²⁰

Even so, a huge gap persists between needed and available resources. In 2002, \$3 billion was spent on efforts to stem the epidemic in low- and middle-income countries.²¹ UNAIDS estimates that funding will have to more than double, to \$6.5 billion, in 2003—with two thirds of the resources coming from international sources.²²

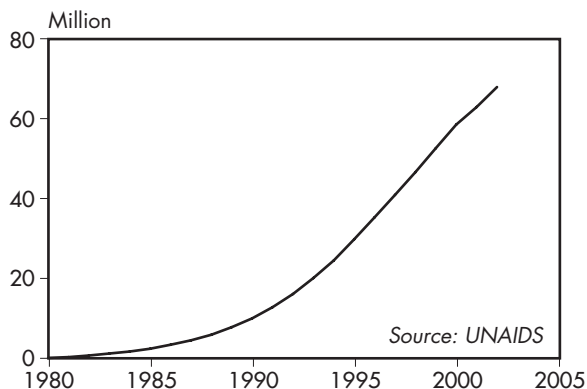


Figure 1: Estimates of Cumulative HIV Infections Worldwide, 1980–2002

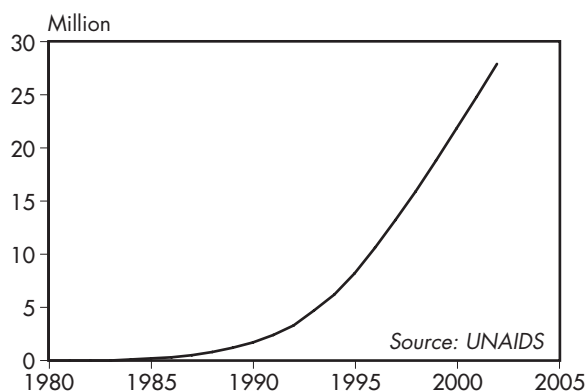


Figure 2: Estimates of Cumulative AIDS Deaths Worldwide, 1980–2002

Cumulative HIV Infections and AIDS Deaths Worldwide, 1980–2002

Year	HIV Infections	AIDS Deaths
	(million)	
1980	0.1	0.0
1981	0.3	0.0
1982	0.7	0.0
1983	1.2	0.0
1984	1.7	0.1
1985	2.4	0.2
1986	3.4	0.3
1987	4.5	0.5
1988	5.9	0.8
1989	7.8	1.2
1990	10.0	1.7
1991	12.8	2.4
1992	16.1	3.3
1993	20.1	4.7
1994	24.5	6.2
1995	29.8	8.2
1996	35.3	10.6
1997	40.9	13.2
1998	46.6	15.9
1999	52.6	18.8
2000	58.5	21.8
2001	62.9	24.8
2002 (prel)	67.9	27.9

Source: Joint United Nations Programme on HIV/AIDS.

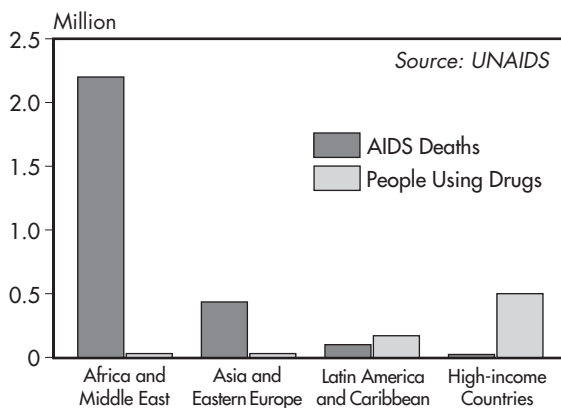


Figure 3: AIDS Deaths and Number of People Using Antiretroviral Drugs, by Region, 2001

Global cigarette production fell to 5.6 trillion pieces in 2002, a decrease of 0.5 percent over 2001.¹ (See Figure 1.) While total production has hovered around the same mark for the past decade, population growth during this time has reduced per capita output 13 percent since 1990, to 897 cigarettes per person a year.² (See Figure 2.)

China, the United States, and Russia—the three largest producers—manufacture just under half of the world's supply. In 2002, China produced 1.7 trillion cigarettes, 31 percent of global production.³ The United States manufactured 580 billion cigarettes, or 10 percent.⁴ But unlike China, which uses 99 percent of the cigarettes it produces, the United States exports 23 percent of its output.⁵

Russia, traditionally a smaller producer, is now the third largest, manufacturing 375 billion cigarettes in 2002, more than twice as many as in 1998.⁶ And Russians are now leaders in per capita cigarette consumption—smoking 1,931 cigarettes in 2002, more than twice the global average.⁷ (See Figure 3.)

Of the more than 1.1 billion smokers worldwide, 82 percent live in low- or middle-income countries.⁸ Between high population growth and aggressive tobacco marketing campaigns in these regions, most of the growth in smoking is expected to occur in these nations—a development that will increasingly burden public health systems already straining from a lack of resources and from diseases like AIDS.⁹

Currently, smoking kills 4.9 million people a year—one in 10 adult deaths—from a range of illnesses that includes heart disease, various forms of cancer, and stroke.¹⁰ By 2030, experts foresee smoking becoming the leading cause of death, responsible for 10 million deaths a year—of which 7 of every 10 would occur in low- or middle-income countries.¹¹

Globally, cigarettes and cigarette lights (matches and lighters) also cause 17,000 fire deaths and \$27 billion of damage each year.¹² In the United States, cigarettes cost \$76 billion a year in health care expenditures and another \$82 billion in lost productivity.¹³ Secondhand smoke also threatens health, increasing the risk of lung

cancer and heart disease more than 20 percent.¹⁴

Since 1999, a coalition led by the World Health Organization has been drafting a Framework Convention on Tobacco Control to reduce consumption through measures that include stronger labeling requirements, marketing restrictions, anti-smuggling laws, and workplace bans.¹⁵ This global treaty will be ready for signature in 2003, but its success is uncertain, as the tobacco industry and several governments have tried to weaken the text.¹⁶

Many regions have already significantly reduced smoking by controlling tobacco. Cigarette taxes lower smoking rates while providing governments with funds to combat smoking-related health problems.¹⁷ In the United Kingdom, as cigarette prices increased in real terms by 70 percent over two decades, consumption declined by more than 35 percent.¹⁸

Counter-advertising, such as anti-smoking commercials and explicit health labels placed on cigarette packs, also helps reduce smoking.¹⁹ In Canada, a 2001 survey showed that 90 percent of smokers noticed the visually disturbing labels and 44 percent were more motivated to quit.²⁰ Such efforts alone cannot combat the huge marketing budgets of tobacco companies. In the United States, the tobacco industry spent \$9.6 billion on advertising and promotion in 2000.²¹ Restrictions have little effect, as the industry just shifts to new marketing mediums, such as sponsoring sporting events.²² Comprehensive marketing bans are more successful, however—decreasing smoking by up to 6.3 percent over two decades.²³ Currently, more than a dozen countries have such bans.²⁴

In 2002, Thailand banned smoking in indoor public spaces, the strictest smoking ban in Asia.²⁵ Smoking bans have proved successful in curbing smoking and reducing exposure to secondhand smoke.²⁶ A review of 26 studies determined that totally smoke-free workplaces cut the number of cigarettes consumed by 29 percent—the equivalent of raising cigarette prices by 73 percent.²⁷ Canada, since implementing a comprehensive national anti-tobacco strategy in 1999, has cut the national smoking rate by 3 percent.²⁸

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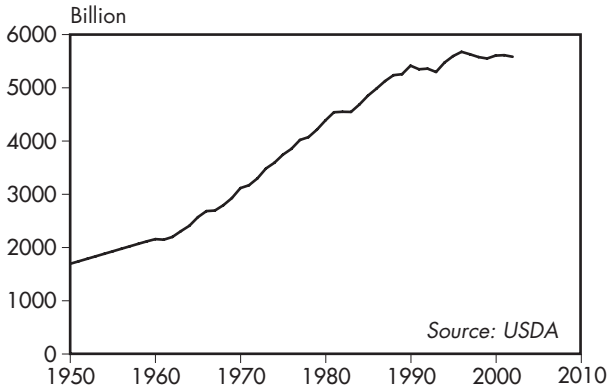


Figure 1: World Cigarette Production, 1950-2002

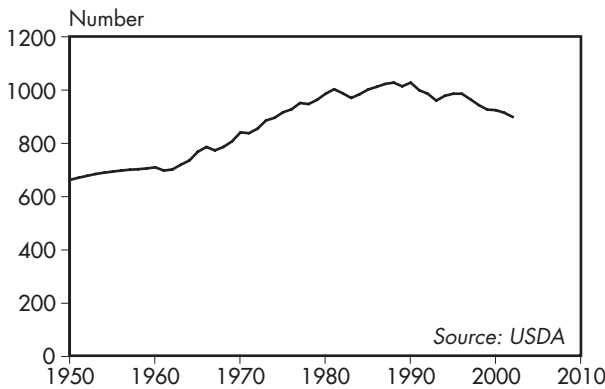


Figure 2: World Cigarette Production Per Person, 1950-2002

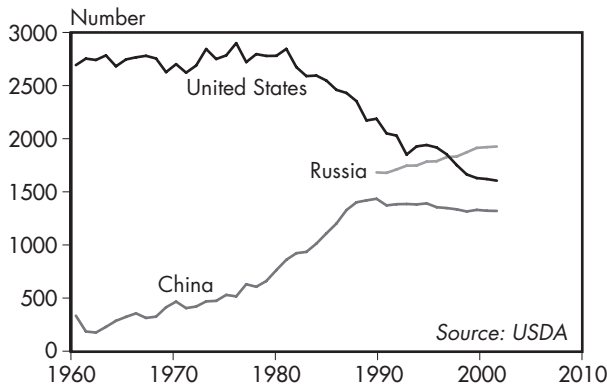


Figure 3: Cigarette Consumption Per Person in the United States and China, 1960-2002, and in Russia, 1990-2002

World Cigarette Production, 1960-2002

Year	Total (billion)	Per Person (number)
1950	1,686	660
1955	1,921	691
1960	2,150	707
1965	2,564	766
1970	3,112	839
1971	3,165	836
1972	3,295	853
1973	3,481	884
1974	3,590	894
1975	3,742	915
1976	3,852	926
1977	4,019	950
1978	4,072	946
1979	4,214	962
1980	4,388	985
1981	4,541	1,002
1982	4,550	987
1983	4,547	969
1984	4,689	983
1985	4,855	1,001
1986	4,987	1,011
1987	5,128	1,022
1988	5,240	1,027
1989	5,258	1,013
1990	5,419	1,027
1991	5,351	998
1992	5,363	985
1993	5,300	959
1994	5,478	977
1995	5,599	985
1996	5,680	985
1997	5,633	964
1998	5,581	942
1999	5,554	925
2000	5,609	923
2001	5,617	913
2002 (prel)	5,587	897

Source: U.S. Department of Agriculture; data for 1950-59 are estimates based on USDA data.

Military Trends



UN/DPI Photo

Violent Conflicts Continue to Decline
Peacekeeping Expenditures Down Slightly

According to AKUF, a conflict research group at the University of Hamburg, the number of wars worldwide stood at 28 in 2002, down from 31 the previous year.¹ In addition, there were 17 “armed conflicts” active in 2002 that were not of sufficient severity to meet AKUF’s criteria for war.² Combining both categories, the total number of violent clashes declined slightly—from 48 in 2001 to 45.³ (See Figure 1.)

The overall number declined because the number of conflicts ending—those in the Kurdish areas of eastern Turkey, the Democratic Republic of the Congo, Guinea, Kosovo, Iran, Tajikistan, and Uzbekistan—surpassed those newly erupting—in Côte d’Ivoire, Madagascar, Congo-Brazzaville, and the Central African Republic.⁴

Meanwhile, the U.S.-led “war on terror,” initially focused on the Afghan Taliban regime, more and more has the makings of an open-ended campaign of worldwide scope. The Bush administration’s words and actions made it seem all but inevitable that an invasion of Iraq would occur in 2003.⁵ Other countries, including Russia, China, India, Indonesia, and Israel, have also cited anti-terrorism as an excuse for wars or acts of internal repression.⁶

The armed forces of countries on whose territory fighting is taking place number in the millions, but it is unclear how many of their soldiers are actually engaged in combat. Non-state armed groups worldwide have at least some 350,000 fighters.⁷ Of these, about 140,000 were with groups that observed cease-fires or were otherwise inactive in 2002.⁸ Some 300,000 children are among government or opposition forces involved in fighting.⁹

Measuring whether the world is becoming more or less violent is not an easy task.¹⁰ Information is often incomplete or contradictory. And definitional and methodological problems confound efforts to establish unambiguous categories and thresholds to tally the number of armed conflicts. Findings from different research groups, therefore, offer some variations in their findings—reflecting a complex reality. Figures compiled by researchers in Sweden and Norway, for instance, show a substantial num-

ber of unclear cases.¹¹ (See Figure 2.)

Researchers at the Heidelberg Institute for International Conflict Research in Germany are assessing political conflict trends from a broader perspective. The total number of conflicts has increased from 108 in 1992 to 173 in 2002.¹² Of these, violent conflicts have recently accounted for a fairly steady one-quarter share.¹³ (See Figure 3.) The 17 conflicts that escalated during 2002 were more than outweighed by 31 de-escalated cases.¹⁴

The majority of conflicts are resolved by nonviolent means, including negotiations and other diplomatic efforts. In addition to various peacekeeping efforts, negotiations were taking place in 43 conflicts in 2002, resulting in three peace treaties (in Chad, Moluccas, and Aceh) and seven cease-fire agreements (which were successful in Angola, Sri Lanka, and Somalia).¹⁵ U.N. arms embargoes and other sanctions were maintained in eight cases.¹⁶

Researchers at PIOOM in the Netherlands have made an even more extensive effort to capture a broader multitude of conflicts, including intercommunal conflicts not recorded elsewhere. PIOOM finds that there are more than 300 “political tension situations”—hard-to-monitor cases that typically either predate violent conflict or follow it, possibly giving rise to renewed violence.¹⁷ These findings underscore that today’s human rights violations, inequalities, and environmental destruction often end up as tomorrow’s wars.

The number of wars alone cannot of course convey the severity of warfare in terms of human suffering, political instability, or social, economic, and environmental damage inflicted. AKUF estimates that more than 7 million people, most of them civilians, have died in the course of the 45 wars and armed conflicts currently active.¹⁸ Cumulatively, these conflicts have cost at least \$250 billion—imposing a heavy toll on countries that for the most part are already desperately poor.¹⁹ And the cost of reconstruction could be much higher.

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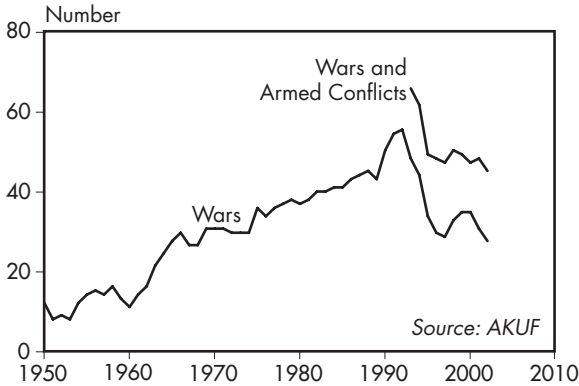


Figure 1: Wars and Armed Conflicts, 1950–2002

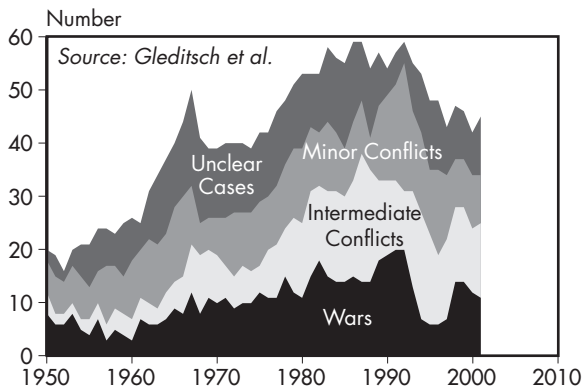


Figure 2: Wars, Intermediate and Minor Conflicts, and Unclear Cases, 1950–2001

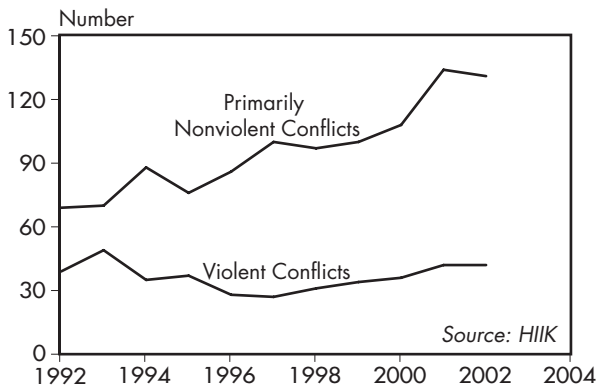


Figure 3: Violent and Nonviolent Conflicts, 1992–2002

Wars and Armed Conflicts, 1950–2002

Year	Wars	Wars and Armed Conflicts
	(number)	
1950	13	
1955	15	
1960	12	
1965	28	
1970	31	
1971	31	
1972	30	
1973	30	
1974	30	
1975	36	
1976	34	
1977	36	
1978	37	
1979	38	
1980	37	
1981	38	
1982	40	
1983	40	
1984	41	
1985	41	
1986	43	
1987	44	
1988	45	
1989	43	
1990	50	
1991	54	
1992	55	
1993	48	65
1994	44	61
1995	34	49
1996	30	48
1997	29	47
1998	33	50
1999	35	49
2000	35	47
2001	31	48
2002 (prel)	28	45

Source: Arbeitsgemeinschaft Kriegsur-sachenforschung and the Institute for Political Science at the University of Hamburg.

Expenditures for United Nations peacekeeping operations from July 2002 to June 2003 are expected to reach about \$2.6 billion—slightly less than in the previous reporting period.¹ (See Figure 1.) This contrasts with military expenditures worldwide of \$839 billion in 2001.² Some 47,000 soldiers, military observers, and civilian police served in peacekeeping missions during

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2002, but the number dropped to below 40,000 by the end of the year.³ (See Figure 2.) In addition, the missions were aided by 10,929 civilians.⁴ Two missions—in Bosnia and Croatia—ended in December 2002.⁵

In addition to peacekeeping operations with strong military and police components, the United Nations also maintained 13 small “political and peace-building” missions during 2002, involving 1,073 mostly civilian staff.⁶ The largest of these is the U.N. Assistance Mission in Afghanistan set up in March 2002.⁷

The permanent members of the Security Council have been reluctant to make significant troop commitments to peacekeeping missions. The leading contributors of personnel are Bangladesh, Pakistan, Nigeria, India, and Ghana, together accounting for 43 percent of the total.⁸

By far the largest current operation, with more than 16,000 peacekeepers, is in Sierra Leone, where a gruesome civil war fueled by diamond wealth has now wound down.⁹ In December 2002, the Security Council decided to raise the authorized personnel strength of the mission in the Democratic Republic of the Congo from 4,250 to 8,700.¹⁰ Following the withdrawal of foreign armies, there is hope that a December 2002 peace accord will end violence among domestic combatants in eastern Congo.¹¹

In four other locations, the United Nations maintains missions that each deploy 3,000–5,500 peacekeepers.¹² In addition to Kosovo, the Ethiopia-Eritrea border, and southern Lebanon, this includes the U.N. Mission in Support of East Timor, a follow-on to the transitional administration that facilitated East Timor’s May 2002 independence.¹³

The Sierra Leone mission costs about \$700 million a year, followed by the Congo operation

at \$608 million.¹⁴ Expenditures for the Kosovo and East Timor deployments run to more than \$300 million each, and the Ethiopia-Eritrea observers cost more than \$200 million.¹⁵

As of 31 December 2002, U.N. members still owed the organization \$1.34 billion for peacekeeping operations.¹⁶ The United States accounted for 40 percent of unpaid dues, or \$536 million.¹⁷ The next-largest amounts were owed by Japan (\$312 million), Italy (\$41 million), China (\$39 million), Spain (\$32 million), and Brazil (\$28 million).¹⁸

A substantial number of peacekeeping missions are also being carried out by regional organizations such as NATO, the Organization for Security and Co-operation in Europe (OSCE), and the Economic Community of West African States, as well as by ad hoc coalitions of states.¹⁹ In recent years, there have been 30–40 non-U.N. missions, involving a far larger number of peacekeeping troops than the United Nations deploys.²⁰ (See Figure 3.) Although information is incomplete, the combined cost of these operations is likely in the range of \$8–12 billion a year.²¹

NATO-led deployments in the Balkans, where more than 50,000 soldiers are patrolling Kosovo and Bosnia, are by far the largest.²² The OSCE maintains about a dozen small missions in Eastern Europe and former Soviet republics, involving about 1,500 people.²³ A multinational observer force of roughly 1,900 soldiers has been deployed since 1982 in the Sinai Peninsula.²⁴ Russia keeps some 5,000 troops in Moldova and the Caucasus.²⁵ And in Afghanistan, the International Security Assistance Force was created in December 2001 to ensure security in Kabul.²⁶ It has about 4,800 soldiers from 28 countries.²⁷ Governments have shortsightedly rejected suggestions that this force be extended beyond Kabul, even though much of Afghanistan is again falling under the sway of warlords and lawlessness.²⁸

The personnel devoted to all forms of peacekeeping—some 110,000 persons in 2002—is dwarfed by the more than 400,000 soldiers deployed abroad for traditional military purposes, more than half of whom are U.S. troops.²⁹

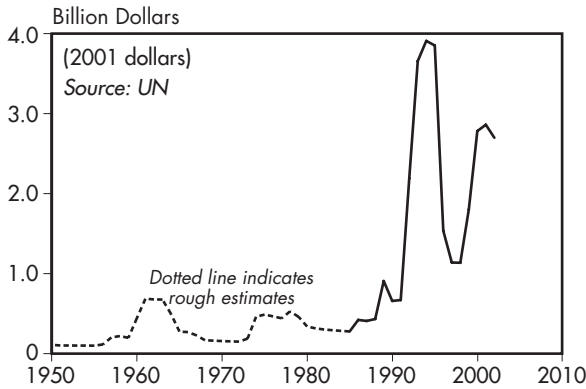


Figure 1: U.N. Peacekeeping Expenditures, 1950–2002

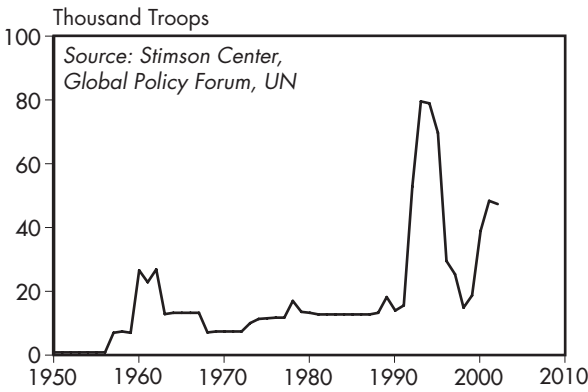


Figure 2: U.N. Peacekeeping Personnel, 1950–2002

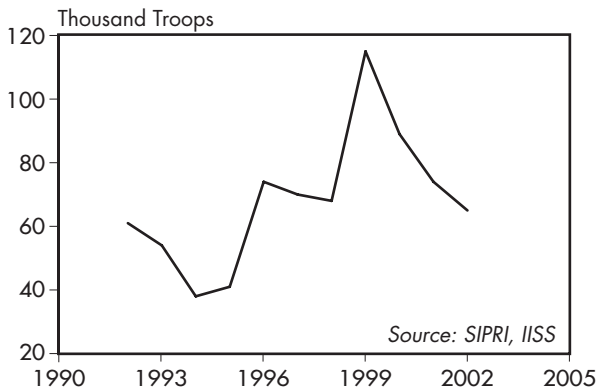


Figure 3: Non-U.N. Peacekeeping Personnel, 1992–2002

U.N. Peacekeeping Expenditures, 1986–2002

Year	Expenditure (billion 2001 dollars)
1986	0.352
1987	0.339
1988	0.363
1989	0.834
1990	0.587
1991	0.598
1992	2.105
1993	3.559
1994	3.809
1995	3.752
1996*	1.456
1997*	1.063
1998*	1.060
1999*	1.721
2000*	2.692
2001*	2.770
2002*	2.609

* July to June of following year.

Source: U.N. Department of Public Information and U.N. Department of Peacekeeping Operations.