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June 5, 2006

Dr. Hans R. Herren, President
Millennium Institute
2200 Wilson Boulevard, Suite 650
Arlington, VA 22201

Dear Hans,

This letter is to confirm my resignation as Vice President for Operations, which I submitted to you by phone on May 20, 2006. As we agreed, my last day will be July 14, 2006. I see my resignation as an opening to rethink and strengthen the design of the management team, and will help however I can to help facilitate that transition. Separately I would like to write a letter to the Board with some recommendations for the future.

This year I have completed my second cycle of five years at MI (1991-1996 and 2001-2006) and hope there may be a way for me to be part of MI again in the future. Some of my accomplishments in the last five years include:

- managing the executive transition, including providing intensive support for the Presidents (outgoing and incoming), Board of Trustees, and staff, and organizing a major transition celebration;
- providing stability and enhanced internal linkages resulting in a doubling of revenue and a decrease in the turnover rate from 24% to a steady 0%;
- providing leadership to enhance recruiting and selection process, and managing the hiring process for three permanent employees (supervising and training two of them);
- realigning and streamlining administrative procedures in accounting, auditing, benefits, reporting, compliance, and human resources, and completing an office move;
- coordinating, scheduling, and monitoring numerous program operations such as multi-week trainings, outreach projects, overseas capacity building missions, and modeling projects; and

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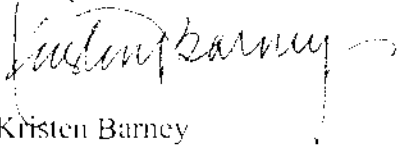
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- handling a wide range of project negotiation and contracting processes, and writing numerous plans, proposals, presentations, and reports.

This fall I will begin a Master of Organizational Development and look forward to the new horizons it may bring me in working with a wider range of organizations to support sustainability and social change.

I would like to thank you for all you have taught me and how you have challenged me to grow, listening to my ideas, all the good advice and teamwork in addressing individual issues with me, and especially your respect and personal kindness. I will miss everyone on the Board and Staff and wish you and MI every success.

Sincerely,

A handwritten signature in black ink that reads "Kristen Barney". The signature is written in a cursive style with a long, sweeping tail that extends to the right.

Kristen Barney
Vice President for Operations

CC: Daniel Gómez-Ibáñez

Foreword by Jimmy Carter

The Report

Global

to the President

2000

ENTERING
THE
TWENTY-FIRST
CENTURY

Gerald O. Barney



MORE THAN
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GLOBAL 2000

“It reads like something out of “The Empire Strikes Back.” The time: the year 2000. The place: Earth, a desolate planet slowly dying of its own accumulating follies. Half of the forests are gone; sand dunes spread where fertile farm lands once lay. Nearly 2 million species of plants, birds, insects and animals have vanished. Yet man is propagating so fast that his cities have grown as large as his nations of a century before.”

—*Newsweek*

“By now such grim warnings have become all too familiar. But this particular forecast is different. For the first time, the U.S. Government has added its full voice to the chorus of environmental Cassandras deeply distressed about the future.”

—*Time*

“Compiled by more than a dozen Federal agencies, *Global 2000* is not a prediction but a projection—and a conservative one at that. It presents so immediate a challenge to worldwide political stability and American economic security that even the most complacent new administration must recognize it as a priority issue for the President and Congress.”

—**John B. Oakes**, *The New York Times*

“[*Global 2000*] is first a warning to the world’s citizens and their leaders. It attempts to mark the boundaries of a new task for the human race, to preserve life on this planet.”

—*Kansas City Star*

Books by Gerald O. Barney

Studies for the 21st Century, Editor (with Martha J. Garrett and Jennie M. Hommel), (forthcoming, 1992).

Managing a Nation: The Microcomputer Software Catalog, Second Edition, Editor (with W. Brian Kreutzer and Martha J. Garrett), Westview Press (1991).

Christian Theology and the Future of Creation, the proceedings of a conference, Editor (with Carey Burkett), Holden Village Press (1990).

Estudios del Siglo 21, Editor (with A. Alonso), Editorial LIMUSA, Mexico, DF (1988).

Managing a Nation's 21st Century Study: A Handbook, (with Dr. Martha J. Garrett), Institute for 21st Century Studies, Inc. (1988).

The Future of the Creation: The Central Challenge for the Church, the proceedings of a symposium, Editor, Institute for 21st Century Studies, Inc. (1986).

Managing a Nation: The Software Sourcebook, Editor (with Sheryl Wilkins), Institute for 21st Century Studies, Inc. (1986).

Global 2000: Implications for Canada (with P. Freeman and C. Ulinsky), Pergamon Press (1981).

The Global 2000 Report to the President: Entering the Twenty-First Century, Editor and Study Director. Three volumes, U.S. Government Printing Office (1980). Also available in Spanish, Japanese, Chinese, German, Hungarian, Italian and French.

The Unfinished Agenda: The Citizen's Policy Guide to Environmental Issues, Editor and Task Force Chairman. Report of the task force sponsored by the Rockefeller Brothers Fund, Crowell Publishers (1977).

Foreword by Jimmy Carter

The Report

Global

to the President

2000

ENTERING
THE
TWENTY-FIRST
CENTURY

Gerald O. Barney

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About the Cover



The Global 2000 Report to the President presents a picture that can be painted only in broad strokes and with a brush still in need of additional bristles. It is, however, the most complete and consistent such picture ever painted by the U.S. Government. Many rapid and undesirable developments are foreseen if public policies concerning population

stabilization, resource conservation, and environmental protection remain unchanged over the coming decades. Vigorous and determined new initiatives are needed around the world. These initiatives need to be taken soon while the picture is yet fluid and nations are still preparing to enter the twenty-first century.

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“I am directing the Council on Environmental Quality and the Department of State, working in cooperation with . . . other appropriate agencies, to make a one-year study of the probable changes in the world’s population, natural resources, and environment through the end of the century.”

President Jimmy Carter
May 23, 1977

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Foreword

by Jimmy Carter

With various political and economic interests competing throughout the world for influence, it's hard to find ways in which agriculture, health care, and environmental preservation can be pursued together.

It's easy to blame people who are cutting down trees. In countries such as Sudan, where in 1989 260,000 people died from war, or Ethiopia, or Somalia, or Mozambique— it's easy to say that if they can't prevent the civil war, somehow or another, they deserve to suffer. It's easy to blame them; it's easy to blame our own government, or outside sources, for the problems. We always know the answers for other people. But, ultimately, we not only want a good life for ourselves, we want a good life for others as well.

What is the mechanism, or the means, by which we can cross the chasm between ourselves and others around the world who can actually implement what we want to accomplish? I believe the means consist of establishing trust by producing results at the grassroots level, and by this immediate benefit convincing the political leadership of the world (including the leadership in this country) that long-term planning of food production, health care, and environmental preservation must be done together, as was envisioned in the process begun when I commissioned the Global 2000 report during my presidency. This one-year study assessed the probable changes in the world's population and environment through the end of the century and was to serve as the foundation of future planning.

At The Carter Center in Atlanta, we try to combine agriculture, health care, and environmental quality work in a number of places around the world. We have projects in China, Bangladesh, Pakistan, Tanzania, Uganda, Kenya, Ghana, Nigeria, Zambia, and other countries.

In the last twenty years, the per-capita production of food grain across Africa has actually gone

down. The average African is now consuming seventy calories fewer per day than twenty years ago. Sometimes the leaders there have to be convinced, contrary to their natural inclination, that what we from The Carter Center are trying to do in health, population, environmental work, and food production is best for their country. I sit at the table with the king or the president or the prime minister, and because I was president they generally bring in all their cabinet officers. I bring with me people such as Dr. Norman Borlaug, who was a Nobel Laureate for his work in the green revolution, and the Carter Center's executive director, Dr. William Foege, who orchestrated the campaign to eradicate smallpox from the Earth, and we tell these leaders what we hope to accomplish in their country. Our purpose at that meeting is to get the country's key people convinced that what we're proposing can benefit them. If they're not convinced, then we are going to be dealing with third-level bureaucrats, not with key cabinet ministers. And nothing will be accomplished.

In January 1986 I made my first trip to Ghana, primarily to talk about food production. That year we got forty farmers to participate in our Global 2000 program. Twenty planted corn, and twenty planted sorghum; each planted about one acre of demonstration plots using traditional farming practices, and one acre using an improved kind of seed and a moderate amount of fertilizer. We didn't bring any mechanization; the farmers still plant with a pointed stick and cultivate with a hoe. But the demonstration plots were so successful—on average tripling the previous yield—that we jumped in 1987 from forty farmers to twelve hundred. In 1988, Global 2000 had sixteen thousand, and in 1989 eighty-five thousand Ghanaian farmers participating in our program.

We also teach farmers environmentally sound growing techniques. They plant now in contour rows, to stave off erosion. Instead of slash-and-burn

techniques—where they would burn off an area of forest, plant it for one year, and then move on to another area—farmers now plant using enough fertilizer so that they can repeatedly grow crops on the same plot of land. That means the forest can be saved. And we have only three foreign employees in Ghana: two Mexicans and one Korean. All the rest of the workers are Ghanaians, so at the end of five years (1991) we plan to withdraw from Ghana, leaving that nation self-sufficient in food production.

Ethiopia is another example of a country in which we have to prove the immediate benefit of our work before we can get started on the road to long-term solutions. The war in Ethiopia between the government and the Eritrean People's Liberation Front—over whether Eritrea should be part of Ethiopia or have the right to self-determination—is twenty-nine years old. Both sides are Marxist. A million people have died in this war, not only as a result of bombs, bullets, and shells, but also from starvation, malnutrition, and diarrhea among children as a direct result of lack of food.

Ethiopia is the poorest country in the world, with a per-capita income of one hundred thirty dollars. Farmers there produce only four bags of grain per acre. It's impossible to get people in such poverty to worry about environmental issues. It's impossible to gain their confidence or forge partnerships with just words. They're starving. So what we at The Carter Center try to do first is get Dr. Borlaug's staff to show farmers how to triple or even quadruple production of grain per acre. When we show a direct and identifiable benefit to the people, the leaders see a political benefit, and that short-term gain gives them enough confidence in us to listen to environmental discussions. I might add that in spite of its being the poorest nation on Earth, Ethiopia spends 60 percent of its total national wealth on weapons.

It's easy to criticize the Third World for its burgeoning population, but deeply related to the problem of too many people is wasteful consumption. I have four children and six grandchildren. It's sobering to me to know that each one of them, and Rosalynn and I, consumes fifteen times as much of the world's limited resources as does the average citizen in India. When we worry about population growth in India, when we tell them they ought to be

ashamed, we ought to remember that fifteen children in India are not going to deplete the world's supply of vital resources any more in the future than one child born in America. Perhaps, in addition to efforts directed at population control in India, we should exert some self-discipline to conserve resources. When I left office we had, after a lot of heartache and struggle, reduced our dependence on imported oil to about 30 percent of total use. Now it's back up to 50 percent, and going up every day. The developed world has got to realize that a large part of the responsibility to conserve resources is still ours.

We also need to change our dependence on weapons production and weapons sales overseas as a basic foundation for jobs in this country. It costs about one million dollars in defense expenditures to create one job—a vast inefficiency. But we have been so seduced, so influenced, so outspent—so outbribed, you might say—in the Congress of the United States by the defense industry that it's almost impossible to prevail when you want to cut back on unnecessary expenditures.

Another inefficiency: The US Agency for International Development program (USAID), which was supposed to be designed for sustainable development in the Third World, is almost totally incompetent. The Carnegie Foundation and The Carter Center, looking to the application of science and technology to improve the quality of life in the Third World, recently did a definitive analysis of USAID. Of the \$11 billion spent annually, \$10 million goes to Israel every day, about two thirds of that amount goes to Egypt, and a huge part of the remainder goes to finance purchases of weapons from American manufacturers. This leaves about \$2.1 billion a year to actually improve the lives of people overseas. Of that \$2.1 billion, 80 percent goes to administrative costs: It costs us eighty cents of every dollar to finance the expenditure of twenty cents of aid in the Third World.

Japan also budgets about \$11 billion for overseas aid. What they do is go to the leaders of the poor nations and say, "We have \$26 million to spend on health care in your country. What is the best way to spend it?" And with minimal administrative costs, with practically no staff in the country, they work harmoniously with that country's minister of health,

spending the money for safe water or to provide immunization programs. This is not purely altruistic on the part of the Japanese, because they are planting small seeds of help that in the future will pay richly in friendship, partnership, and availability of increasingly scarce natural resources. They will also reap a benefit in commerce, creating markets for Japanese consumer products. You can't do that when you spend eighty cents of every dollar on administrative costs.

In working with the developing world, you see the relationships between health care and other problems, such as illiteracy. Here's an example, and an opportunity for people who work in telecommunications research and development:

A lot of the most arable land in the Third World has not even been planted because of two afflictions: Guinea worm and river blindness. Guinea worm, which most Americans have never heard of, affects ten million people a year. It's a parasite people get from drinking impure water. The water contains the worm's egg, and inside the human body that egg grows into a worm a meter long in twelve months. The worm then emerges through the skin, leaving a horrible sore.

River blindness is caused by the sting of a fly found along fast-flowing streams. Sometimes you go to villages where 35 percent of the adults are blind; you see adults walking around holding one end of a stick with a little five-year-old child holding the other end, acting as a seeing-eye baby. And you know that if something isn't done, that child will be blind someday, too.

We have treatments for both these conditions, donated by U.S. corporations such as Merck and Company, and we can go in with them. In fact, the Global 2000 program and other health care organizations have targeted 1995 as the year by which Guinea worm will be eradicated. But remember, we're trying to teach people to take care of themselves. So there's another problem: How do you educate people who are basically illiterate about the cause of Guinea worm or river blindness? We ran our first test case in Pakistan, in a place where only 12 percent of the men, and almost no women, were literate. There are currently two ways to communicate with these people. One is through radio, and the

other is by giving them printed cartoon that tell the story in pictures. These are not very efficient methods, and so there's a need for telecommunications people to get involved, to invent a way to communicate health information to people who are illiterate. Long-term planners can see that these problems—health care and illiteracy—are related.

The world political situation, far from being hopeless, offers opportunities to help everywhere. I wish the major universities throughout the West would, in effect, adopt a Third World country. The University of Georgia has a great agricultural school and a great forestry school, and could go to a country such as Haiti and ask, "What can we do to help you to provide jobs, replant your forests, improve tourism, educate your people, build better homes, establish democracy?" Haiti would accept a university, whereas it would never accept any intrusion from the U.S. government (most countries won't, by the way). Working with major corporations in our country and others, the university could bring in students and give them an opportunity to help, and in the process those students would learn things about the developing world they might otherwise never know.

Rosalynn and I are volunteers with Habitat for Humanity, which builds housing for homeless people. In June we're going to Tijuana to build a hundred homes on a barren hillside in a desperately poor area. It's arid, so there aren't many trees. We've used wood, two-by-four studs, before. Now we're working on a problem: How are we going to build adobe block homes with inexperienced volunteers who lack masonry skills? We'll find a way, but the point is we'll do it with absolutely no government money, and in the process we'll develop innovative ways for inexperienced people, in arid parts of the world at least, to build homes at a very low cost.

I would like to see the Global 2000 process revived. It was killed when I left Washington because of a political aversion to long-term planning with an emphasis on the environment. It ought to be resurrected and concentrated in the National Academy of Sciences, not in the federal government. It ought to be supported by the major corporations. It wouldn't take much money. This we can do collectively, as men and women committed to sustainable

development, to a better quality of life, for all those on Earth.

I don't have any sense of impending doom or despair. I think that things can be changed. If you look at the face of just one Ghanaian farmer who for the first time is producing sixteen bags of sorghum or corn where previously there were just three or

four bags, and see how eager he is to join our program of environmental work as well, you know the Third World is not a hopeless place. The people there are waiting to be partners with people here in seeing that everybody on Earth can have a better way of life.

Preface to the Revised Edition

Since its publication in 1980, *The Global 2000 Report to the President* has become a minor classic. More than 1.5 million copies have been sold. Volume I has been published in English, French, German, Japanese, Chinese, Hungarian, Spanish, and Italian; Volume II (776 pages) has been published in English, Spanish, German, Japanese, and Chinese. The highly technical Volume III has been published only in English.

The enduring value of *Global 2000* is due not only to its demographic, economic, resource, and environmental projections, but also to the integration of those projections. Prior to its publication, no national government had ever issued such a comprehensive, integrated analysis of the global future.

No national government has yet produced a report comparable to *Global 2000*, but many nations have undertaken integrated studies of their own national future. Many are modeled, in part, on the *Global 2000* work. These new national analyses are generally referred to as twenty-first-century studies.

Such studies are critical for countries struggling to survive complex challenges that include economic development, population growth, resource depletion, and environmental deterioration. These interrelated issues not only can lead to social disruptions, economic instability, and political unrest within individual countries, but also can be a major cause of tension and armed conflict across national borders.

Throughout the world there are many governmental units, including planning agencies, that address economic, demographic, resource, and environmental issues through plans and analyses that look ahead up to five years. Unfortunately, short-term approaches usually fail to take into account adequately the linkages among sectors and, as a consequence, eventually lead to other, often more serious, problems.

Fortunately, there is growing recognition by leaders around the world that global and national prosperity will require long-term strategies rather than quick-fix solutions. These leaders have appointed task forces to analyze alternative national futures in terms of their sustainability. The teams are usually headed by someone of considerable political stature, often a top governmental minister, and they all include professionals from a variety of backgrounds. Such groups, often called "21st century study teams," have been established or are forming in over 30 nations.

The twenty-first-century studies do not predict the future; rather, they provide detailed factual information and projections that help people make choices today that lead to the future they desire. These studies differ in three important ways from the routine research done by planning agencies. First, they examine many major global sectors in an integrated way: they project future trends in such areas as trade, foreign debt, demography, natural resources, environment, technology, health, education, and security, and they look at ways in which these areas interact. Second, these studies take a long-term approach rather than limiting their perspectives to "five-year" plans. This is critical since the importance of some trends and their intersectoral linkages is much more apparent in projections that extend for a decade or two. Third, these studies evaluate alternative futures in terms of economic, ecological, political, and social sustainability. They continually address the question, "Will this development strategy lead to a healthy situation in the long run, or will it have troublesome consequences after a few years?"

The Institute for 21st Century Studies was founded to encourage and support such studies through training and other assistance [see Appendix C]. Among our training materials is a handbook on how to conduct a twenty-first-century study and a sourcebook on microcomputer software for managing a nation's future. Volume I of *The Global 2000 Report* has also been a useful instructional tool.

Unfortunately, *The Global 2000 Report to the President* is no longer available from the U.S. Government Printing Office. The last copies of Volume I were sold in early 1988. Volume III sold out in 1987, and less than 100 copies of Volume II remain unsold at this writing. Pergamon Press still has copies of an edition consisting of Volume I plus the most important parts of Volume II, and Penguin has copies of an edition combining Volume I and the full Volume II.

Because of Volume I's importance and because it continues to be used in many university courses, the Institute and Seven Locks Press has decided to bring out this revised version of Volume I.

Martha J. Garrett
Co-Director
Institute for 21st Century Studies

Gerald O. Barney
Co-Director
Institute for 21st Century Studies
Study Director for the *Global 2000* study

Preface to First Edition

Environmental problems do not stop at national boundaries. In the past decade, we and other nations have come to recognize the urgency of international efforts to protect our common environment.

As part of this process, I am directing the Council on Environmental Quality and the Department of State, working in cooperation with the Environmental Protection Agency, the National Science Foundation, the National Oceanic and Atmospheric Administration, and other appropriate agencies, to make a one-year study of the probable changes in the world's population, natural resources, and environment through the end of the century. This study will serve as the foundation of our longer-term planning.

President Carter issued this directive in his Environmental Message to the Congress on May 23, 1977. It marked the beginning of what became a three-year effort to discover the long-term implications of present world trends in population, natural resources, and the environment and to

assess the Government's foundation for long-range planning.

Government concern with trends in population, resources, and environment is not new. Indeed, study of these issues by Federal commissions and planning boards extends back at least 70 years. The earlier studies, however, tended to view each issue without relation to the others, to limit their inquiries to the borders of this nation and the short-term future, and to have relatively little effect on policy.² What is new in more recent studies is a growing awareness of the interdependence of population, resources, and environment. The Global 2000 Study is the first U.S. Government effort to look at all three issues from a long-term global perspective that recognizes their interrelationships and attempts to make connections among them.

The Global 2000 Study is reported in three volumes. This Summary is the first volume. Volume II, the Technical Report, presents the Study in further detail and is referenced extensively in this Summary. The third volume provides technical documentation on the Government's global models.

Major Findings and Conclusions

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

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

This, in essence, is the picture emerging from the U.S. Government's projections of probable changes in world population, resources, and environment by the end of the century, as presented in the Global 2000 Study. They do not predict what will occur. Rather, they depict conditions that are likely to develop if there are no changes in public policies, institutions, or rates of technological advance, and if there are no wars or other major disruptions. A keener awareness of the nature of the current trends, however, may induce changes that will alter these trends and the projected outcome.

Principal Findings

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

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

World food production is projected to increase 90 percent over the 30 years from 1970 to 2000. This translates into a global per capita increase of

less than 15 percent over the same period. The bulk of that increase goes to countries that already have relatively high per capita food consumption. Meanwhile per capita consumption in South Asia, the Middle East, and the LDCs of Africa will scarcely improve or will actually decline below present inadequate levels. At the same time, real prices for food are expected to double.

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

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

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

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

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

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

Serious deterioration of agricultural soils will occur worldwide, due to erosion, loss of organic matter, desertification, salinization, alkalinization, and waterlogging. Already, an area of cropland and grassland approximately

the size of Maine is becoming barren wasteland each year, and the spread of desert-like conditions is likely to accelerate.

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

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

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

Conclusions

At present and projected growth rates, the world's population would reach 10 billion by 2030 and would approach 30 billion by the end of the twenty-first century. These levels correspond closely to estimates by the U.S. National Academy of Sciences of the maximum carrying capacity of the entire earth. Already the populations in sub-Saharan Africa and in the Himalayan hills of Asia have exceeded the carrying capacity of the immediate area, triggering an erosion of the land's capacity to support life. The resulting poverty and ill health have further complicated efforts to reduce fertility. Unless this circle of interlinked problems is broken soon, population growth in such areas will unfortunately be slowed for reasons other than declining birth rates. Hunger and disease will claim more babies and young children, and more of those surviving will be mentally and physically handicapped by childhood malnutrition.

Indeed, the problems of preserving the carrying capacity of the earth and sustaining the possibility of a decent life for the human beings that inhabit it are enormous and close upon us. Yet there is reason for hope. It must be emphasized that the Global 2000 Study's projections are based on the assumption that national policies regarding population stabilization, resource conservation, and environmental protection will remain essentially unchanged through the end of the century. But in fact, policies are beginning to change. In some areas, forests are being replanted after cutting. Some nations are taking steps to reduce soil losses and desertification. Interest in

energy conservation is growing, and large sums are being invested in exploring alternatives to petroleum dependence. The need for family planning is slowly becoming better understood. Water supplies are being improved and waste treatment systems built. High-yield seeds are widely available and seed banks are being expanded. Some wildlands with their genetic resources are being protected. Natural predators and selective pesticides are being substituted for persistent and destructive pesticides.

Encouraging as these developments are, they are far from adequate to meet the global challenges projected in this Study. Vigorous, determined new initiatives are needed if worsening poverty and human suffering, environmental degradation, and international tension and conflicts are to be prevented. There are no quick fixes. The only solutions to the problems of population, resources, and environment are complex and long-term. These problems are inextricably linked to some of the most perplexing and persistent problems in the world—poverty, injustice, and social conflict. New and imaginative ideas—and a willingness to act on them—are essential.

The needed changes go far beyond the capability and responsibility of this or any other single nation. An era of unprecedented cooperation and commitment is essential. Yet there are opportunities—and a strong rationale—for the United States to provide leadership among nations. A high priority for this Nation must be a thorough assessment of its foreign and domestic policies relating to population, resources, and environment. The United States, possessing the world's largest economy, can expect its policies to have a significant influence on global trends. An equally important priority for the United States is to cooperate generously and justly with other nations—particularly in the areas of trade, investment, and assistance—in seeking solutions to the many problems that extend beyond our national boundaries. There are many unfulfilled opportunities to cooperate with other nations in efforts to relieve poverty and hunger, stabilize population, and enhance economic and environmental productivity. Further cooperation among nations is also needed to strengthen international mechanisms for protecting and utilizing the “global commons”—the oceans and atmosphere.

To meet the challenges described in this Study, the United States must improve its ability to identify emerging problems and assess alternative responses. In using and evaluating the Government's present capability for long-term global analysis, the Study found serious inconsistencies in the methods and assumptions employed by the various agencies in making their projections. The Study itself made a start toward resolving these inadequacies. It represents the Government's first attempt to produce an inter-related set of population, resource, and environmental projections, and it has brought forth the most consistent set of global projections yet achieved by U.S. agencies. Nevertheless, the projections still contain serious gaps and contradictions that must be corrected if the Government's analytic capability is to be improved. It must be acknowledged that at present the Federal agencies are not always capable of providing projections of the quality needed for long-term policy decisions.

While limited resources may be a contributing factor in some instances,

the primary problem is lack of coordination. The U.S. Government needs a mechanism for continuous review of the assumptions and methods the Federal agencies use in their projection models and for assurance that the agencies' models are sound, consistent, and well documented. The improved analyses that could result would provide not only a clearer sense of emerging problems and opportunities, but also a better means for evaluating alternative responses, and a better basis for decisions of worldwide significance that the President, the Congress, and the Federal Government as a whole must make.

With its limitations and rough approximations, the Global 2000 Study may be seen as no more than a reconnaissance of the future; nonetheless its conclusions are reinforced by similar findings of other recent global studies that were examined in the course of the Global 2000 Study (see Appendix). All these studies are in general agreement on the nature of the problems and on the threats they pose to the future welfare of humankind. The available evidence leaves no doubt that the world—including this Nation—faces enormous, urgent, and complex problems in the decades immediately ahead. Prompt and vigorous changes in public policy around the world are needed to avoid or minimize these problems before they become unmanageable. Long lead times are required for effective action. If decisions are delayed until the problems become worse, options for effective action will be severely reduced.

The Study in Brief

The President's directive establishing the Global 2000 Study called for a "study of the probable changes in the world's population, natural resources, and environment through the end of the century" and indicated that the Study as a whole was to "serve as the foundation of our longer-term planning." The findings of the Study identify problems to which world attention must be directed. But because all study reports eventually become dated and less useful, the Study's findings alone cannot provide the foundation called for in the directive. The necessary foundation for longer-term planning lies not in study findings *per se*, but in the Government's continuing institutional capabilities—skilled personnel, data, and analytical models—for developing studies and analyses. Therefore, to meet the objectives stated in the President's directive, the Global 2000 Study was designed not only to assess probable changes in the world's population, natural resources, and environment, but also, through the study process itself, to identify and strengthen the Government's capability for longer-term planning and analysis.²

Building the Study

The process chosen for the Global 2000 Study was to develop trend projections using, to the fullest extent possible, the long-term global data and models routinely employed by the Federal agencies. The process also included a detailed analysis of the Government's global modeling capabilities as well as a comparison of the Government's findings with those of other global analyses.

An executive group, established and co-chaired by the Council on Environmental Quality and the State Department, together with a team of designated agency coordinators, assisted in locating the agencies' experts, data, and analytical models. A number of Americans from outside Government and several people from other coun-

tries advised on the study structure. The agencies' expert met occasionally with some of these advisers to work out methods for coordinating data, models, and assumptions.

Overall, the Federal agencies have an impressive capability for long-term analyses of world trends in population, resources, and environment. Several agencies have extensive, richly detailed data bases and highly elaborate sectoral models. Collectively, the agencies' sectoral models and data constitute the Nation's present foundation for long-term planning and analysis.³

Currently, the principal limitation in the Government's long-term global analytical capability is that the models for various sectors were not designed to be used together in a consistent and interactive manner. The agencies' models were created at different times, using different methods, to meet different objectives. Little thought has been given to how the various sectoral models—and the institutions of which they are a part—can be related to each other to project a comprehensive, consistent image of the world. As a result, there has been little direct interaction among the agencies' sectoral models.⁴

With the Government's current models, the individual sectors addressed in the Global 2000 Study could be interrelated only by developing projections sequentially, that is, by using the results of some of the projections as inputs to others. Since population and gross national product (GNP) projections were required to estimate demand in the resource sector models, the population and GNP projections were developed first, in 1977. The resource projections followed in late 1977 and early 1978. All of the projections were linked to the environment projections, which were made during 1978 and 1979.⁵

The Global 2000 Study developed its projections in a way that furthered interactions, improved internal consistency, and generally strengthened the Government's global models. However, the effort to harmonize and integrate

the Study's projections was only partially successful. Many internal contradictions and inconsistencies could not be resolved. Inconsistencies arose immediately from the fact that sequential projections are not as interactive as events in the real world, or as projections that could be achieved in an improved model. While the sequential process allowed some interaction among the model's sectors, it omitted the continuous influence that all the elements—population, resources, economic activity, environment—have upon each other. For example, the Global 2000 Study food projections assume that the catch from traditional fisheries will increase as fast as world population, while the fisheries projections indicate that this harvest will not increase over present levels on a sustainable basis. If it has been possible to link the fisheries and food projections, the expected fisheries contribution to the human food supply could have been realistically reflected in the food projections. This and other inconsistencies are discussed in detail in the Technical Report.⁹

Difficulties also arise from multiple allocation of resources. Most of the quantitative projections simply assume that resource needs in the sector they cover—needs for capital, energy, land, water, minerals—will be met. Since the needs for each sector are not clearly identified, they cannot be summed up and compared with estimates of what might be available. It is very likely that the same resources have been allocated to more than one sector.¹⁰

Equally significant, some of the Study's resource projections implicitly assume that the goods and services provided in the past by the earth's land, air, and water will continue to be available in larger and larger amounts, with no maintenance problems and no increase in costs. The Global 2000 Study projections for the environment cast serious doubt on these assumptions.¹¹

Collectively, the inconsistencies and missing linkages that are unavoidable with the Government's current global models affect the Global 2000 projections in many ways. Analysis of the assumptions underlying the projections and comparisons with other global projections suggest that most of the Study's quantitative results understate the severity of potential problems the world will face as it prepares to enter the twenty-first century.¹²

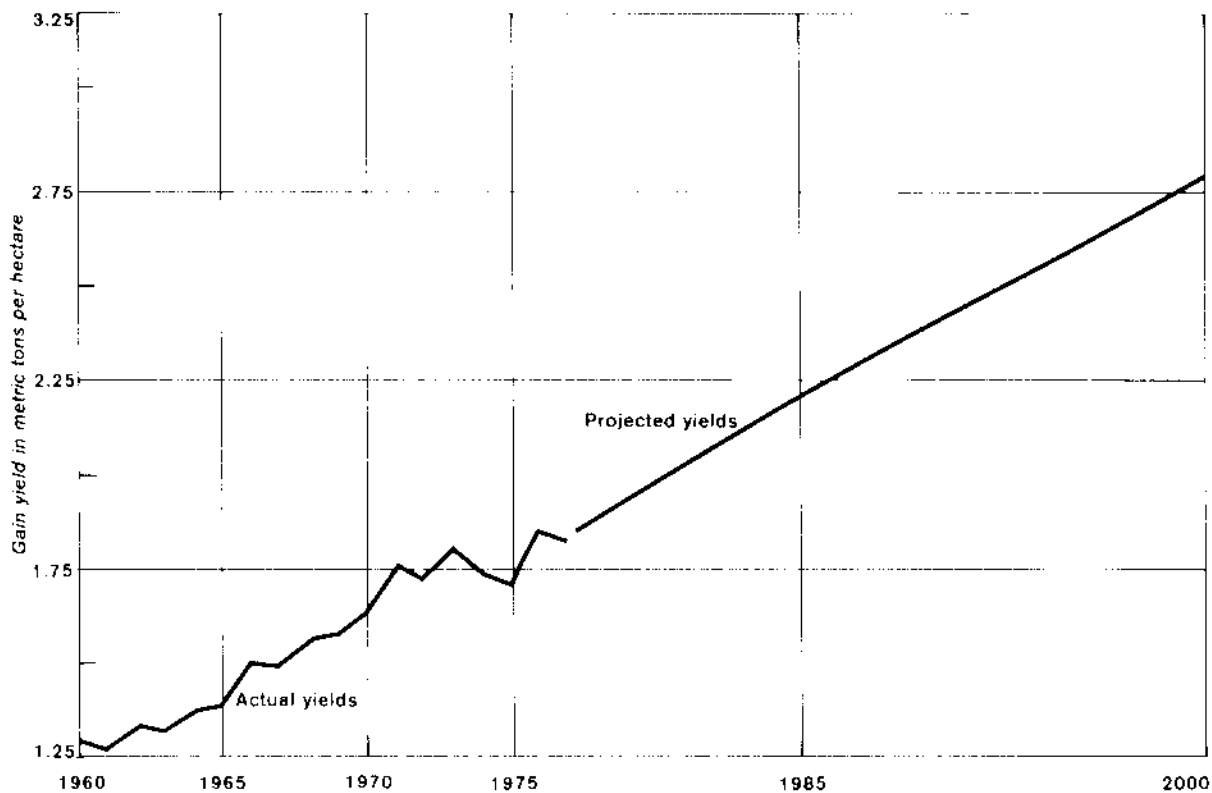
The question naturally arises as to whether circumstances have changed significantly since the earliest projections were made in 1977. The answer is no. What changes have occurred generally support the projections and highlight the problems identified. The brief summaries of the projections (beginning on the next page) each conclude with comments on how the projections might be altered if redeveloped today.

The Global 2000 Study has three major underlying assumptions. First, the projections assume a general continuation around the world of present public policy relating to population stabilization, natural resource conservation, and environmental protection.* The projections thus point to the expected future if policies continue without significant changes.

The second major assumption relates to the effects of technological developments and of the market mechanism. The Study assumes that rapid rates of technological development and adoption will continue, and that the rate of development will be spurred on by efforts to deal with problems identified by this Study. Participating agencies were asked to use the technological assumptions they normally use in preparing long-term global projections. In general, the agencies assume a continuation of rapid rates of technological development and no serious social resistance to the adoption of new technologies. Agricultural technology, for example, is assumed to continue increasing crop yields as rapidly as during the past few decades, including the period of the Green Revolution (see Figure 1). The projections assume no revolutionary advances—such as immediate wide-scale availability of nuclear fusion for energy production—and no disastrous setbacks—such as serious new health risks from widely used contraceptives or an outbreak of plant disease severely affecting an important strain of grain. The projections all assume that price, operating through the market mechanism, will reduce demand whenever supply constraints are encountered.¹³

Third, the Study assumes that there will be no major disruptions of international trade as a result

*There are a few important exceptions to this rule. For example, the population projections anticipate shifts in public policy that will provide significantly increased access to family planning services. (See Chapter 14 of the Technical Report for further details.)



Fi Figure 1. Historic and projected grain yields, 1960-2000. The food projections assume a continued rapid development and adoption of agricultural technology, much of it heavily dependent on fossil fuels.

of war, disturbance of the international monetary system, or political disruption. The findings of the Study do, however, point to increasing potential for international conflict and increasing stress on international financial arrangements. Should wars or a significant disturbance of the international monetary system occur, the projected trends would be altered in unpredictable ways.¹¹

Because of the limitations outlined above, the Global 2000 Study is not the definitive study of future population, resource, and environment conditions. Nor is it intended to be a prediction. The Study does provide the most internally consistent and interrelated set of global projections available so far from the U.S. Government. Furthermore, its major findings are supported by a variety of nongovernmental global studies based on more highly interactive models that project similar trends through the year 2000 or beyond.⁴

Population and Income

Population and income projections provided the starting point for the Study. These projections

were used wherever possible in the resource projections to estimate demand.

Population

One of the most important findings of the Global 2000 Study is that enormous growth in the world's population will occur by 2000 under any of the wide range of assumptions considered in the Study. The world's population increases 55 percent from 4.1 billion people in 1975 to 6.35 billion by 2000, under the Study's medium-growth projections.* While there is some uncertainty in these numbers, even the lowest-growth population projection shows a 46 percent increase--to 5.9 billion people by the end of the century.⁷

Another important finding is that the rapid growth of the world's population will not slow appreciably. The rate of growth per year in 1975 was 1.8 percent; the projected rate for 2000 is 1.7 per-

*Most of the projections in the Technical Report—including the population projections—provide a high, medium, and low series. Generally, only the medium series are discussed in this Summary Report.

cent. Even under the lowest growth projected, the number of persons being added annually to the world's population will be significantly greater in 2000 than today.¹⁶

Most of the population growth (92 percent) will occur in the less developed countries rather than in the industrialized countries. Of the 6.35 billion people in the world in 2000, 5 billion will live in LDCs. The LDCs' share of the world's population increased from 66 percent in 1950 to 72 percent in 1975, and is expected to reach 79 percent by 2000. LDC population growth rates will drop slightly, from 2.2 percent a year in 1975 to 2 percent in 2000, compared with 0.7 percent and 0.5 percent in developed countries. In some LDCs,

growth rates will still be more than 3 percent a year in 2000. Table 1 summarizes the population projections. Figure 2 shows the distribution of the world's population in 1975 and 2000.¹⁷

Figure 3 shows the age structure of the population in less developed and industrialized nations for 1975 and 2000. While the structures shown for the industrialized nations become more column-shaped (characteristic of a mature and slowly growing population), the structures for the LDCs remain pyramid-shaped (characteristic of rapid growth). The LDC populations, predominantly young with their childbearing years ahead of them, have a built-in momentum for further growth. Because of this momentum, a world

TABLE 1
Population Projections for World, Major Regions, and Selected Countries

	1975	2000	Percent Increase by 2000	Average Annual Percent Increase	Percent of World Population in 2000
<i>millions</i>					
World	4,090	6,351	55	1.8	100
More developed regions	1,131	1,323	17	0.6	21
Less developed regions	2,959	5,028	70	2.1	79
Major regions					
Africa	399	814	104	2.9	13
Asia and Oceania	2,274	3,630	60	1.9	57
Latin America	325	637	96	2.7	10
U.S.S.R. and Eastern Europe	384	460	20	0.7	7
North America, Western Europe, Japan, Australia, and New Zealand	708	809	14	0.5	13
Selected countries and regions					
People's Republic of China	935	1,329	42	1.4	21
India	618	1,021	65	2.0	16
Indonesia	135	226	68	2.1	4
Bangladesh	79	159	100	2.8	2
Pakistan	71	149	111	3.0	2
Philippines	43	73	71	2.1	1
Thailand	42	75	77	2.3	1
South Korea	37	57	55	1.7	1
Egypt	37	65	77	2.3	1
Nigeria	63	135	114	3.0	2
Brazil	109	226	108	2.9	4
Mexico	60	131	119	3.1	2
United States	214	248	16	0.6	4
U.S.S.R.	254	309	21	0.8	5
Japan	112	133	19	0.7	2
Eastern Europe	130	152	17	0.6	2
Western Europe	344	378	10	0.4	6

Source: Global 2000 Technical Report, Table 2-10.

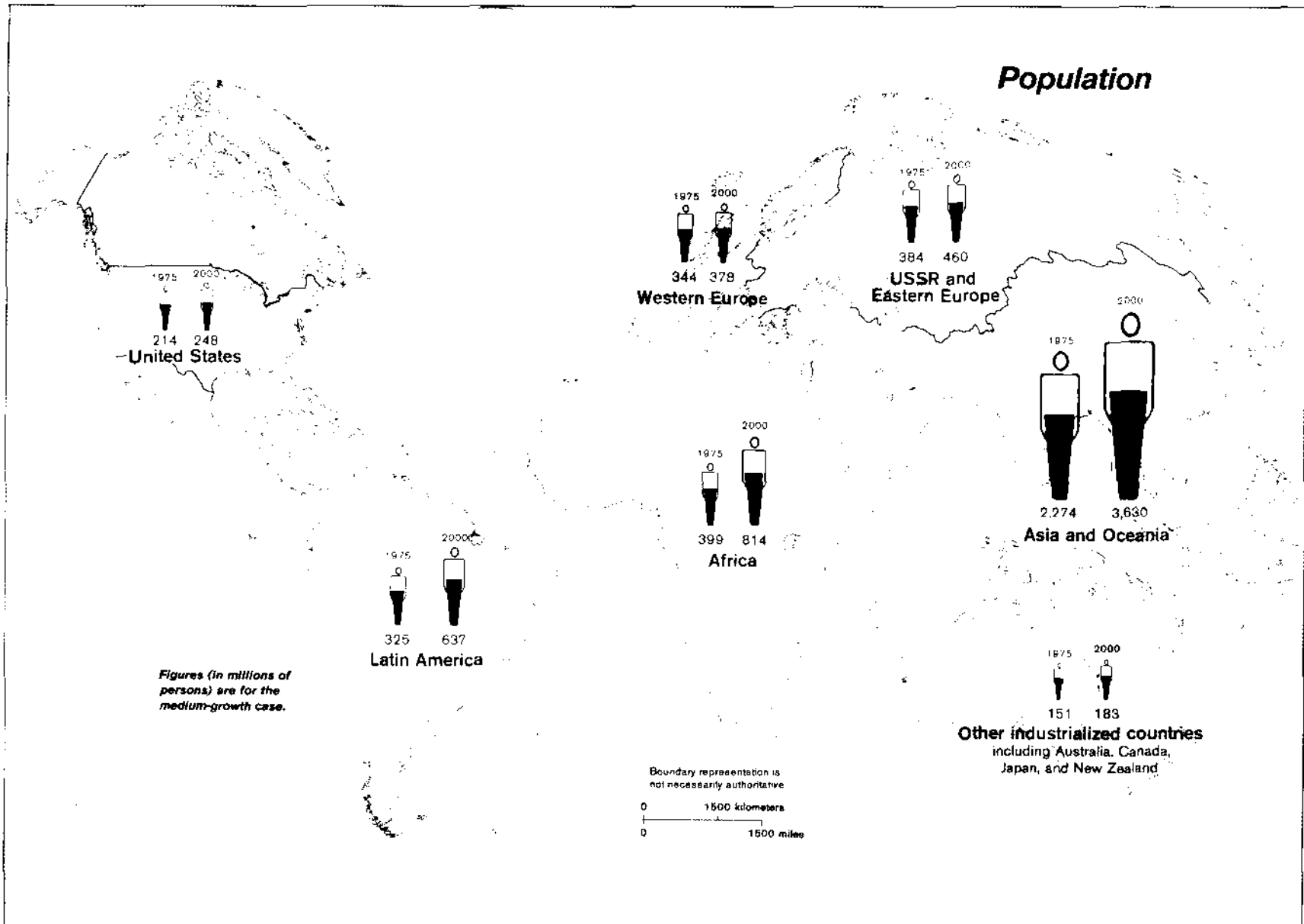


Figure 2. Distribution of the world's population, 1975 and 2000.

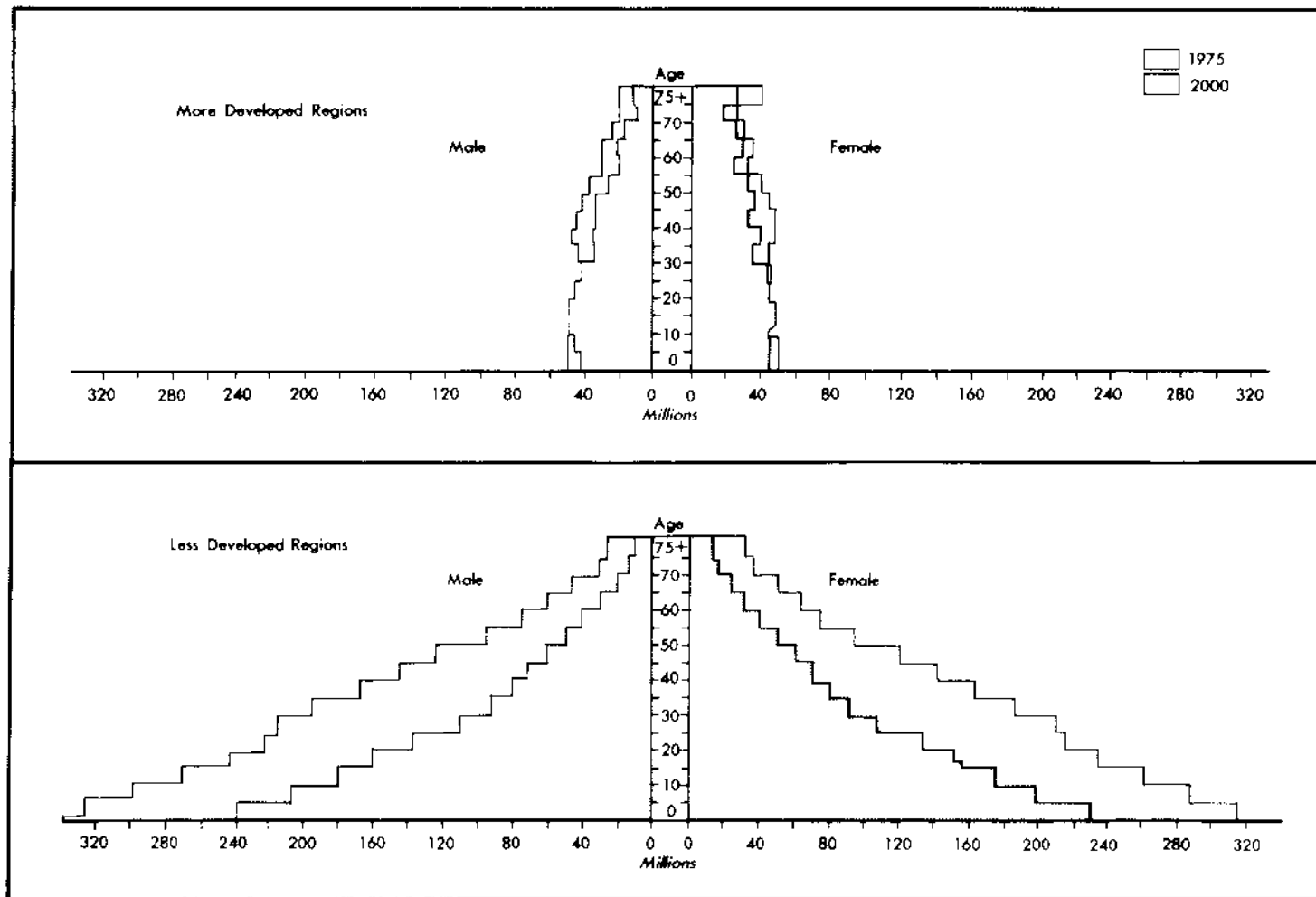


Figure 3. Age-sex composition of the world's population, medium series, 1975 and 2000.

population of around 6 billion is a virtual certainty for 2000 even if fertility rates were somehow to drop quickly to replacement levels (assuming there are no disastrous wars, famine, or pestilence).²

The projected fertility rates and life expectancies, together with the age structure of the world's population, are extremely significant for later years since these factors influence how soon world population could cease to grow and what the ultimate stabilized global population could be. The Study's projections assume that world fertility rates will drop more than 20 percent over the 1975-2000 period, from an average of 4.3 children per fertile woman to 3.3. In LDCs, fertility rates are projected to drop 30 percent as a result of moderate progress in social and economic development and increased availability and use of contraceptive methods. The projections also assume that life expectancies at birth for the world will increase 11 percent, to 65.5 years, as a result of improved health. The projected increases in life expectancies and decreases in fertility rates produce roughly counterbalancing demographic effects.¹⁷

In addition to rapid population growth, the LDCs will experience dramatic movements of rural populations to cities and adjacent settlements. If present trends continue, many LDC cities will become almost inconceivably large and crowded. By 2000, Mexico City is projected to have more than 30 million people—roughly three times the present population of the New York metropolitan area. Calcutta will approach 20 million. Greater Bombay, Greater Cairo, Jakarta, and Seoul are all expected to be in the 15-20 million range, and 400 cities will have passed the million mark.¹⁸ Table 2 shows present and projected populations for 12 LDC cities.

Rapid urban growth will put extreme pressures on sanitation, water supplies, health care, food, shelter, and jobs. LDCs will have to increase urban services approximately two-thirds by 2000 just to stay even with 1975 levels of service per capita. The majority of people in large LDC cities are likely to live in "uncontrolled settlements"—slums and shantytowns where sanitation and other public services are minimal at best. In many large cities—for example, Bombay, Calcutta, Mexico City, Rio de Janeiro, Seoul, Taipei—a quarter or more of the population already lives in uncontrolled settlements, and the trend is sharply upward. It is not certain whether the trends projected

TABLE 2
Estimates and Rough Projections of Selected Urban Agglomerations in Developing Countries

	1960	1970	1975	2000
	<i>Millions of persons</i>			
Calcutta	5.5	6.9	8.1	19.7
Mexico City	4.9	8.6	10.9	31.6
Greater Bombay	4.1	5.8	7.1	19.1
Greater Cairo	3.7	5.7	6.9	16.4
Jakarta	2.7	4.3	5.6	16.9
Seoul	2.4	5.4	7.3	18.7
Delhi	2.3	3.5	4.5	13.2
Manila	2.2	3.5	4.4	12.7
Tehran	1.9	3.4	4.4	13.8
Karachi	1.8	3.3	4.5	15.9
Bogota	1.7	2.6	3.4	9.5
Lagos	0.8	1.4	2.1	9.4

Source: Global 2000 Technical Report, Table 13-9.

for enormous increases in LDC urban populations will in fact continue for 20 years. In the years ahead, lack of food for the urban poor, lack of jobs, and increasing illness and misery may slow the growth of LDC cities and alter the trend.¹⁹

Difficult as urban conditions are, conditions in rural areas of many LDCs are generally worse. Food, water, health, and income problems are often most severe in outlying agricultural and grazing areas. In some areas rural-urban migration and rapid urban growth are being accelerated by deteriorating rural conditions.²⁰

An updated medium-series population projection would show little change from the Global 2000 Study projections. World population in 2000 would be estimated at about 6.18 (as opposed to 6.35) billion, a reduction of less than 3 percent. The expectation would remain that, in absolute numbers, population will be growing more rapidly by the end of the century than today.²¹

The slight reduction in the population estimate is due primarily to new data suggesting that fertility rates in some areas have declined a little more rapidly than earlier estimates indicated. The new data indicate that fertility declines have occurred in some places even in the absence of overall socioeconomic progress.²² Between 1970 and 1976, for example, in the presence of extreme poverty and malnutrition, fertility declines of 10-15 percent occurred in Indonesia and 15-20 percent in the poorest income classes in Brazil.²³

Income

Projected declines in fertility rates are based in part on anticipated social and economic progress, which is ultimately reflected in increased income. Income projections were not possible, and gross national product projections were used as surrogates. GNP, a rough and inadequate measure of social and economic welfare, is projected to increase worldwide by 145 percent over 25 years from 1975 to 2000. But because of population growth, per capita GNP increases much more slowly, from \$1,500 in 1975 to \$2,300 in 2000—an increase of 53 percent. For both the poorer and the richer countries, rates of growth in GNP are projected to decelerate after 1985.²⁶

GNP growth is expected to be faster in LDCs (an average annual growth of 4.5 percent, or an approximate tripling over 25 years) than in developed regions (an average annual growth of 3.3 percent, or somewhat more than a doubling). However, the LDC growth in gross national product develops from a very low base, and population growth in the LDCs brings per capita increases in GNP down to very modest proportions. While parts of the LDC world, especially several countries in Latin America, are projected to improve significantly in per capita GNP by 2000, other countries will make little or no gains from their present low levels. India, Bangladesh, and Pakistan, for example, increase their per capita GNP by 31 percent, 8 percent, and 3 percent, respectively, but in all three countries GNP per capita remains below \$200 (in 1975 dollars).²⁷ Figure 4 shows projected per capita gross national product by regions in 2000.

The present income disparities between the wealthiest and poorest nations are projected to widen. Assuming that present trends continue, the group of industrialized countries will have a per capita GNP of nearly \$8,500 (in 1975 dollars) in 2000, and North America, Western Europe, Australia, New Zealand, and Japan will average more than \$11,000. By contrast, per capita GNP in the LDCs will average less than \$600. For every \$1 increase in GNP per capita in the LDCs, a \$20 increase is projected for the industrialized countries.²⁸ Table 3 and 4 summarize the GNP projections. The disparity between the developed countries and the less developed group is so marked that dramatically different rates of change would be needed to reduce the gap significantly by

the end of the century.* Disparities between the rich and poor of many LDCs are equally striking.

Updated GNP projections would indicate somewhat lower economic growth than shown in the Global 2000 projections. Projections for the member nations of the Organization for Economic Cooperation and Development (OECD) have been revised downward over the past 2-3 years because of the effects of increasing petroleum prices and because of anticipated measures to reduce inflation. In turn, depressed growth in the OECD economies is expected to lead to slowed growth in LDC economies. For example, in 1976 the World Bank projected that the industrialized nations' economies would expand at 4.9 percent annually over the 1980-85 period; by 1979 the Bank had revised these projections downward to 4.2 percent annually over the 1980-90 period. Similarly, between 1976 and 1979 Bank projections for LDC economies dropped from 6.3 percent (1980-85 period) to 5.6 percent (1980-90 period).²⁹

Resources

The Global 2000 Study resource projections are based to the fullest extent possible on the population and GNP projections presented previously. The resource projections cover food, fisheries, forests, nonfuel minerals, water, and energy.

Food

The Global 2000 Study projects world food production to increase at an average annual rate of about 2.2 percent over the 1970-2000 period. This rate of increase is roughly equal to the record growth rates experienced during the 1950s, 1960s, and early 1970s, including the period of the so-called Green Revolution. Assuming no deterioration in climate or weather, food production is projected to be 90 percent higher in 2000 than in 1970.³⁰

*The gap would be significantly smaller—in some cases it would be reduced by about one half—if the comparison were based on purchasing power considerations rather than exchange rates, but a large gap would remain. (See I. B. Kravis et al., *International Comparisons of Real Product and Purchasing Power*, Baltimore: Johns Hopkins University Press, 1978.)

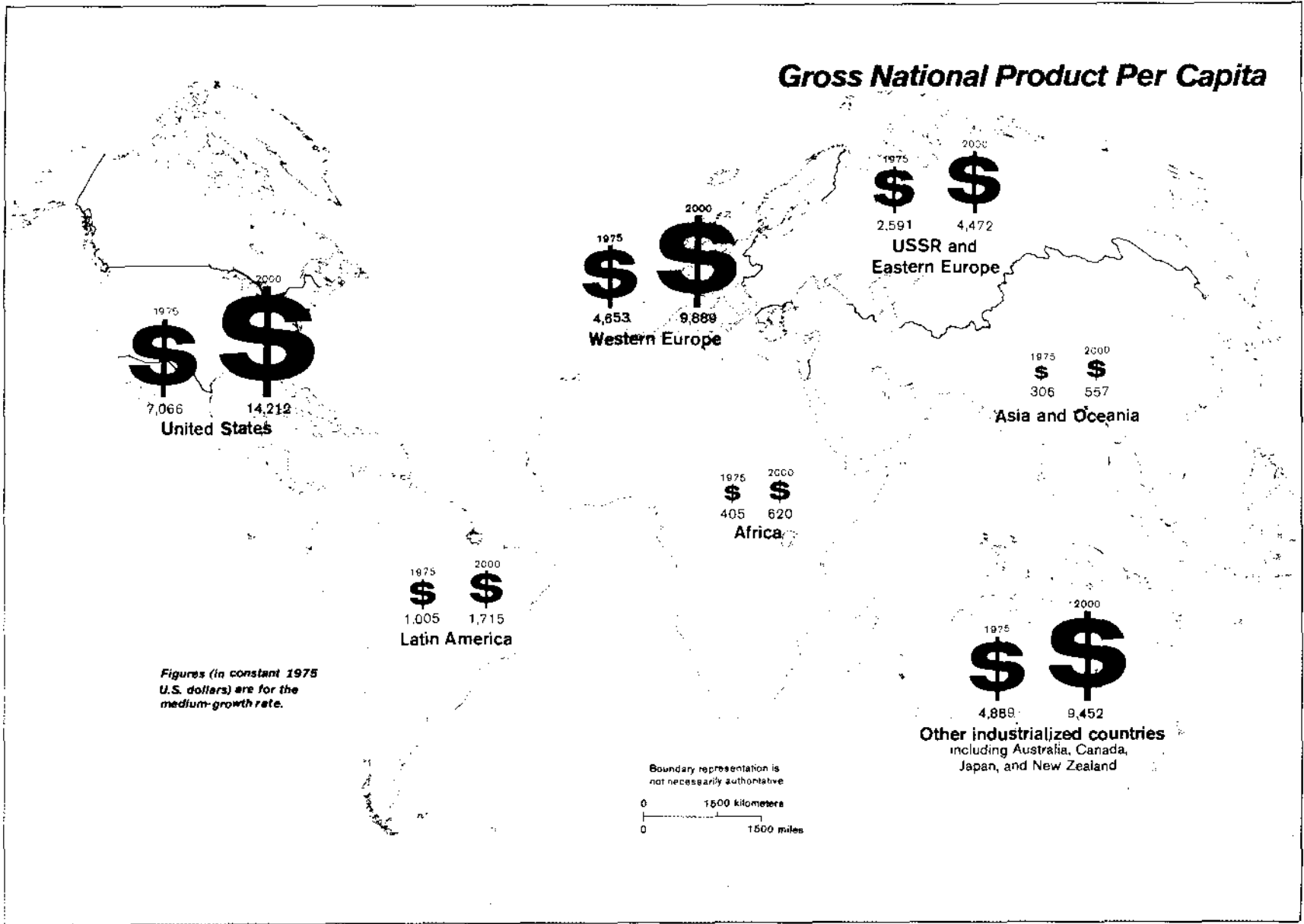


Figure 4. Per capita gross national product, by regions, 1975 and 2000.

TABLE 3
GNP Estimates (1975) and Projections and Growth Rates (1985, 2000) by Major Regions and Selected Countries and Regions

(Billions of constant 1975 dollars)

	1975 GNP	1975-85 Growth Rate	1985 Projections ^a	1985-2000 Growth Rate	2000 Projections ^a
		<i>percent</i>		<i>percent</i>	
WORLD	6,025	4.1	8,991	3.3	14,677
More developed regions	4,892	3.9	7,150	3.1	11,224
Less developed regions	1,133	5.0	1,841	4.3	3,452
MAJOR REGIONS					
Africa	162	5.2	268	4.3	505
Asia and Oceania	697	4.6	1,097	4.2	2,023
Latin America ^b	326	5.6	564	4.5	1,092
U.S.S.R. and Eastern Europe	996	3.3	1,371	2.8	2,060
North America, Western Europe, Japan, Australia, and New Zealand	3,844	4.0	5,691	3.1	8,996
SELECTED COUNTRIES AND REGIONS^c					
People's Republic of China	286	3.8	413	3.8	718
India	92	3.6	131	2.8	198
Indonesia	24	6.4	45	5.4	99
Bangladesh	9	3.6	13	2.8	19
Pakistan	10	3.6	14	2.8	21
Philippines	16	5.6	27	4.4	52
Thailand	15	5.6	25	4.4	48
South Korea	19	5.6	32	4.4	61
Egypt	12	5.6	20	4.4	38
Nigeria	23	6.4	43	5.4	94
Brazil	108	5.6	185	4.4	353
Mexico	71	5.6	122	4.4	233
United States ^d	1,509	4.0	2,233	3.1	3,530
U.S.S.R.	666	3.3	917	2.8	1,377
Japan	495	4.0	733	3.1	1,158
Eastern Europe (excluding U.S.S.R.)	330	3.3	454	2.8	682
Western Europe	1,598	4.0	2,366	3.1	3,740

^aProjected growth rates of gross national product were developed using complex computer simulation techniques described in Chapter 16 of the Global 2000 Technical Report. These projections represent the result of applying those projected growth rates to the 1975 GNP data presented in the 1976 World Bank Atlas. Projections shown here are for medium growth rates.

^bIncludes Puerto Rico.

^cIn most cases, gross national income growth rates were projected for groups of countries rather than for individual countries. Thus the rates attributed to individual LDCs in this table are the growth rates applicable to the group with which that country was aggregated for making projections and do not take into account country specific characteristics.

^dDoes not include Puerto Rico.

Source: Global 2000 Technical Report, Table 3-3.