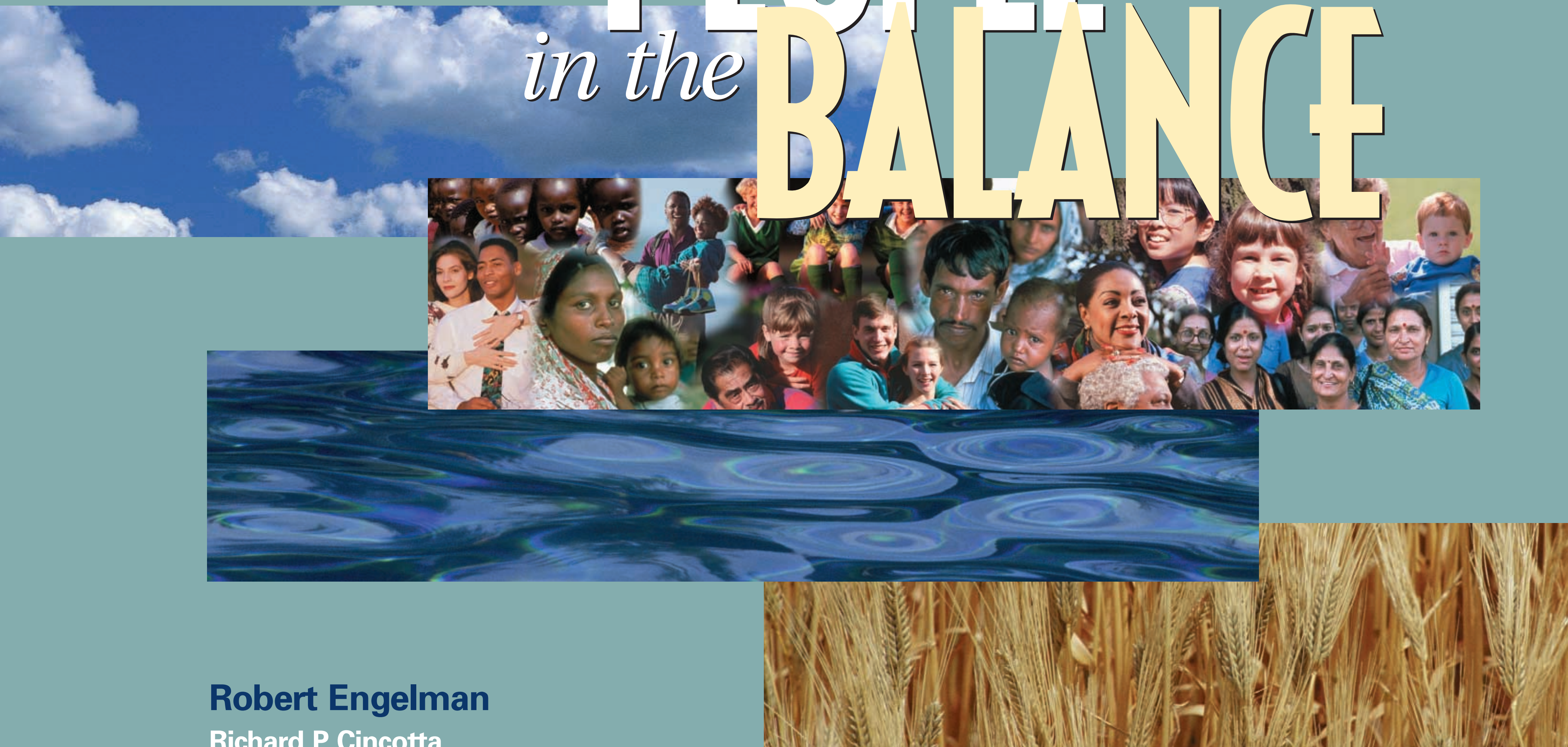
# PEOPLE *in the* BALANCE

*Population and Natural Resources at the Turn of the Millennium*




**Robert Engelman**

**Richard P. Cincotta**

**Bonnie Dye**

**Tom Gardner-Outlaw**

**Jennifer Wisnewski**



Population Action International

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## Acknowledgments


The authors wish to thank external reviewers Tom Boden, Lester Brown, Stuart Gaffin, Carl Haub, H. Gyde Lund, Russell Mittermeier, Sara Montanaro, Brian C. O'Neill, David Pimentel, Sandra Postel, Carmen Revenga and Robin White. The authors also thank Matthew Guyer, Nada Chaya and Akia Talbot of Population Action International who made numerous helpful suggestions. The views expressed here, along with any errors, are those of the authors.

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Population Action INTERNATIONAL

1300 19th Street, NW Second Floor
Washington, DC 20036 USA
Tel: 202-557-3400
Fax: 202-728-4177
www.populationaction.org

Publication requests to pubinq@popact.org





ISBN: 1-889735-06-X

# SUMMARY

At the turn of the millennium, the future of the relationship between people and critical natural resources has begun to appear more hopeful than it has for some time. Human population growth is slowing down. While slowing, however, significant growth continues, meaning that more people will be sharing such finite resources as fresh water and cropland. And in some regions—notably in sub-Saharan Africa and parts of Asia—large families and early pregnancies provide strong momentum for population growth that could continue for generations to come. But the braking of this growth has been significant enough that many analysts of natural resources are more optimistic about their future availability than they were in the early 1990s.

This publication updates key data on population growth and the state of critical natural resources as the millennium turns. Among its key findings:

- By the year 2025, between 2.4 billion and 3.2 billion people could live in either water-scarce or water-stressed conditions, depending on future rates of population growth. This compares with 505 million people in these circumstances in the year 2000. Water shortage is likely to grow especially acute in the Middle East and in much of Africa.
- An estimated 420 million people live today in countries that have less than .07 hectare of cultivated land per person. This benchmark is considered the bare minimum capable of supplying a vegetarian diet for one person, under ideal conditions without use of artificial chemical inputs or loss of soil and soil nutrients. The number of people living in such critically land-scarce countries is projected to increase to between 557 million and 1.04 billion in 2025.
- Global fish production climbed modestly in 1997, mostly from the expansion of aquaculture in China. Most fisheries worldwide remain fully exploited or in decline, however, and the amount of fish caught per fisher is declining steadily.
- Today about 1.8 billion people live in 40 countries with less than 0.1 hectare of forested land per capita, an indicator of critically low levels of forest cover. Based on the medium population projection and current trends in deforestation, by 2025, the number of people affected could nearly triple to 4.6 billion.
- One-fifth of the world's population lives on the 12 percent of its land surface with the highest densities of non-human species. Human population is growing significantly faster in these *biodiversity hotspots* than in the world—or even in developing countries—as a whole.
- In 1996, measurable per capita emissions of $CO_2$ rose modestly. This continued a several-year trend of increasing per capita fossil-fuel consumption that, in combination with growing world population, raised the risk of climate change by accelerating the accumulation of greenhouse gases in the global atmosphere. With less than 5 percent of world population, the United States contributed more than 20 percent of these important emissions.

Population is hardly the only force applying pressure to the natural world and the resources it provides. But few would argue that the environmental challenges humanity faces in the 21st century and beyond will become easier to address as the number of human beings continues to increase. For each of the natural resources considered here, the long ascent of population reveals itself as a critical variable influencing resource availability on local, regional and global scales.

The most hopeful aspect of the slowing of population growth remains little known among environmentalists and the general public. More and more, young people on every continent want to start bearing children later in life and to have smaller families than at any time in history. Likewise, in greater proportions than ever, women and girls in particular want to go to school and to college, and they want to find fulfilling and well-paid employment. Helping people in every country obtain the information and services they need to put these ambitions into effect is all that can be done, and all that needs to be done, to bring world population growth to a stable landing in the new century.

What is needed is for government and the private sector to make reproductive health services available to all who seek them, to make sure that girls and boys can go to and stay in school, and to make economic opportunities as accessible to women as to men. Combined with improved energy and natural-resource technologies and saner models of consumption and the "good life," these strategies can bring humanity into enduring balance with the environment and the natural resources that people will always need. ■

# POPULATION TRENDS and ENVIRONMENTAL LINKAGES, 2000

How many people can a millennium support? Demographically, the one now ending could scarcely have been more different from the one that preceded it. From the year 1 to A.D. 1000, world population was essentially stable, with any increases eventually balanced by equal decreases. By demographers' best estimates, the first millennium began with 300 million people on the planet, and ended with about the same number.[1] As the second millennium closes, by contrast, there are 20 times more people on the planet, and no certainty about when or at what number world population growth will end.

The unprecedented growth of the past thousand years is linked in complex ways to the environmental challenges humanity faces in the next thousand. The data in this publication trace the impact of this growth on the changing availability of natural resources that are critical to human well-being. Population growth—and the related growth of natural-resource consumption—has strained the natural environment, but the demographic trends of the past 30 years are also a source of hope for nature and humanity's future. The growth of world population is slowing down because women are increasingly delaying childbearing and having fewer children than ever before.

Human numbers are still rising at a pace that would result in a population of 12 billion people by the middle of the new century—if those growth rates continued without change. In much of the world, per capita income and natural-resource consumption are increasing even more rapidly. Along with many scientists, environmentalists worry that the 21st century will witness growing scarcities of key natural resources that could contribute to poverty, conflicts and increases in death rates. Yet, at the same time, the fact that birthrates are falling means that populations of most nations will become progressively older and in some cases will even shrink in the 21st century.

To unravel the competing concerns, it helps to understand that demographic patterns vary between regions and levels of economic development. It also pays to consider the long view and not to assign too much certainty to demographic projections. We can examine ranges of likely outcomes [see chart, The Range of Possibilities, on p. 5], but we cannot know the future. The spread of most likely outcomes calculated by United Nations demographers suggests that the 21st century will end with between 5 billion and 16 billion people, but we cannot even be sure of this. Projections of global and national population change are neither forecasts nor estimates. Rather they are straightforward calculations based on current population trends in each country, modified by assumptions about future rates of births, deaths and migration.

Critically, population projections assume continued declines in both birth and death rates. Yet neither of these trends is assured, especially in the absence of major new investments in education and health care. The set of health services most closely related to population change is *reproductive health programs.* These programs contribute to lower birth rates through providing contraceptive services, and prolong life by addressing the health of mothers and children and dampening transmission of the virus that causes AIDS. What happens to world population tomorrow depends critically on the investments that governments and others make today, especially in reproductive health but also in education and economic opportunities that improve the lives of girls and women.

Here is where we are after the turning of the calendar's zeros: There are more than six billion of us, almost four times as many as in 1900. Life expectancy has soared, especially the survival prospects for infants and children, the latter the dominant factor in the population growth of the 1900s. At the opening of the Third Millennium, our settlements and farm fields dominate much of the six habitable continents, and for the first time in history we are almost as likely to live in a city or suburb as in a village or on a farm. On average, each of us is or will become a parent to 2.5 children, and world population grows by about 1.3 percent annually. This means Earth is

home to roughly 78 million more people each year, 215,000 more each day, 9,000 more each hour.

All but 3 percent of this growth takes place in developing countries, yet the United States and some other industrialized countries also contribute to world population growth. And the average age of human beings is rising as birthrates decline and life expectancy increases. Yet 1 billion of the planet's inhabitants are between 15 and 24 years old, and in many countries school construction barely keeps pace with the need for new classrooms.

## Widening Gaps

It is increasingly a demographically uneven world, mirroring to some extent the economically uneven world in which one-fifth of the population, mostly living in industrialized countries, earns the vast majority of monetary income. Life expectancy continues to rise in much of the world. But over the last quarter century it fell in 18 countries,[2] most of them overwhelmed by the HIV/AIDS pandemic. In Europe, family size has dropped well below the roughly two-child level at which parents replace themselves in the population, setting the stage for current or future population declines. In the United States, Canada and Australia, fertility rates are closer to replacement level. Due to both large proportions of young people and relatively high immigration rates, population growth averages around 1 percent annually in these countries, with no end to population growth in sight. In Latin America and in Asia—the continent on which most human beings live—access to contraception has helped fertility rates to fall by half in little more than a generation. Population growth rates in these regions resemble that of the world as a whole.

In most of Africa and in the Middle East the transition to later childbirths and small families has not yet advanced very far. Family size still averages five or six children, and significant increases in population appear to be in store for countries that already are critically short of cropland, forests and renewable fresh water. Population growth rates often exceed 2.6 percent, twice the global rate, in a number of countries where governments have the fewest resources for needed education and health care.

## People and the Balance of Natural Resources

It may be that *human* resources are the most important for development and prosperity, yet history and current experience demonstrate that this is most true when *natural* resources are abundant, cheap and accessible to all. Today's globalized and computerized economy, for example, owes much to inexpensive fossil fuel for the low prices of food, transportation and indoor temperature control. These low prices, in turn, free up income for consumption of less essential goods. If fossil fuel—or fresh water, or cropland, or wood products—suddenly became scarce and expensive, appreciation for the importance of natural resources would return quickly. And despite innovative approaches to dealing with changes in natural-resource supply, the reality is that supplies of these resources are finite.

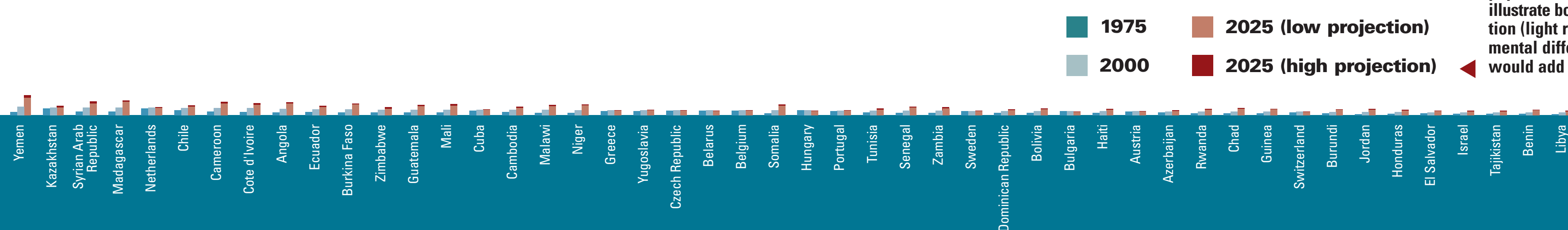
In the case of most critical natural resources, supplies are diminishing or degrading as more human beings use them with greater intensity. They must be shared among more people, and this can spark a sequence of competing claims and rising anxieties that challenges governments and other institutions. The long debate over the impact of population growth on the environment is gradually converging on overall agreement that contemporary population growth is among a handful of factors that strongly influence the sustainability of natural-resource use in many or most places. Population never acts alone in causing such environmental problems as water scarcity and global warming. Yet its influence cannot be severed from more direct causes of these problems, such as overdrawn aquifers and rising greenhouse gas emissions.

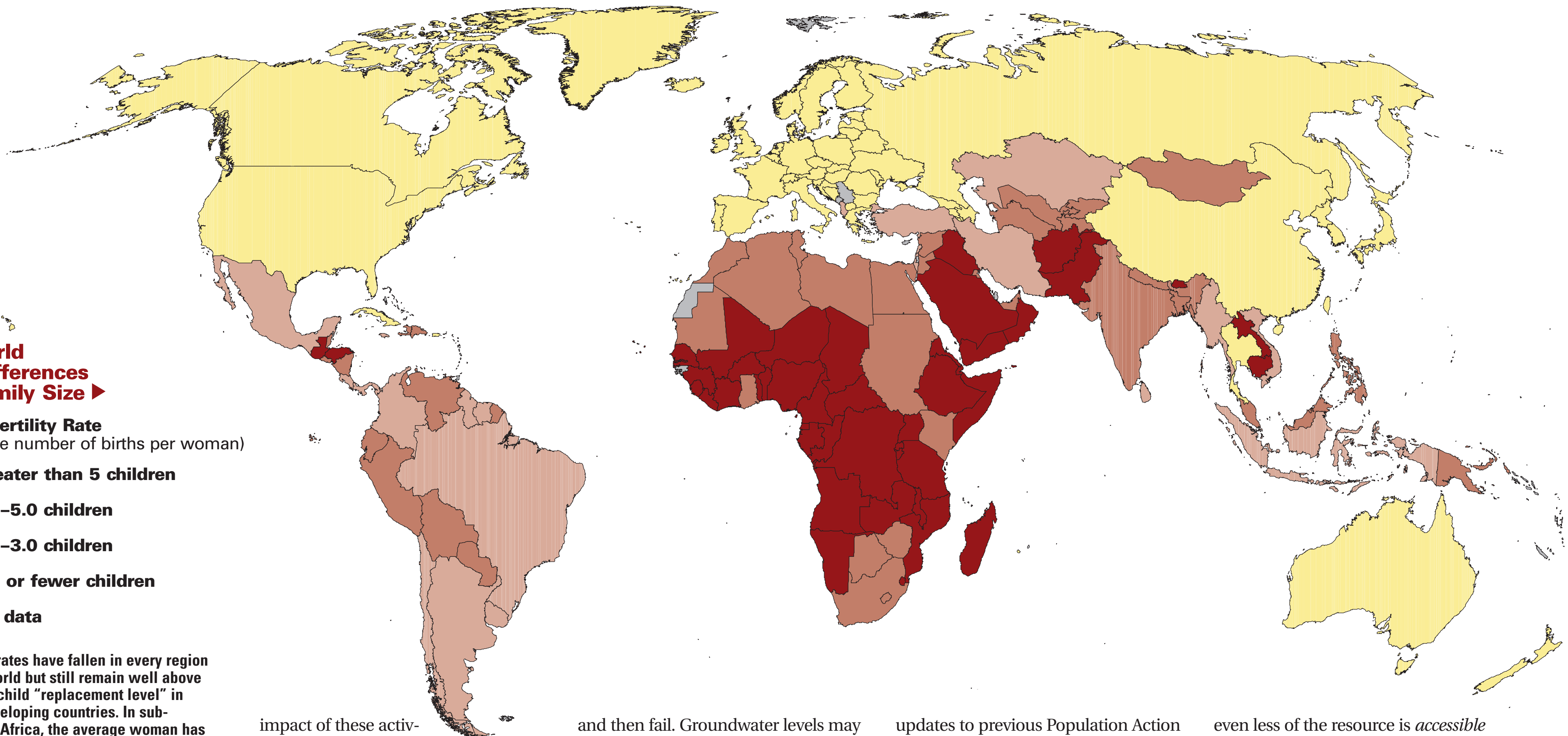
## The Growing Impact

Over long periods, population growth tends to expand the scale of human activities and thus magnifies the

**The Population of Nations, 1975, 2000 and 2025** (projected)

**The bar representing projected 2025 population in each country is shaded to illustrate both the low population projection (light red shading) and the incremental difference the high projection would add (dark red shading).**





**A World of Differences in Family Size ▶**

**Total Fertility Rate**
(average number of births per woman)

- **Greater than 5 children**
- **3.1–5.0 children**
- **2.2–3.0 children**
- **2.1 or fewer children**
- **No data**

**Fertility rates have fallen in every region of the world but still remain well above the two-child "replacement level" in most developing countries. In sub-Saharan Africa, the average woman has more than five children in her lifetime.**

impact of these activities on ecosystems and natural resources such as the atmosphere, forests and water supplies. Scale is critical in determining when human interactions with the environment become unsustainable. Often natural resource bases will accumulate stress for decades without apparent harm, until some previously unforeseen natural threshold is crossed, and resource decline or scarcity hits local inhabitants. Soil erosion may continue with no major damage until crop roots encounter rocky soil—and then fail. Groundwater levels may fall with no great penalty, until the fuel needed to lift water out of deep wells becomes unavailable or too expensive. The accumulation of heat-trapping greenhouse gases over centuries may suddenly reach levels that trigger significant changes in temperatures and precipitation. These occurrences, called *jump effects*, tend to increase as population grows, often in concert with rising per capita consumption and changes in technology and policy.

The databases, charts and maps in this publication—a compendium of updates to previous Population Action International reports—collectively illustrate relationships between changing population size and the *availability* of key natural resources (in the sense of their simple presence in the physical environment) needed for health and well-being. For some of these resources, experts have identified benchmarks of per capita availability below which countries can be considered in conditions of stress or scarcity relative to that resource. Inequities within countries further exacerbate resource stress, and may mean that even less of the resource is *accessible* (that is, in a place and condition in which users can actually gain access to it), especially to the poor. Wealthier countries may import specific resources or find substitutes for them. Nonetheless, per capita natural-resource availability remains an instructive indicator of the overall impact of population change on the natural world.

Prior to 1950, most of the natural resources considered here had adequate per capita availability in almost every country. Today the numbers of people living in countries scarce in renewable fresh water, cropland or forests are growing more rapidly than world population as a whole. Without major efforts to address this trend, the 21st century is likely to witness an upward spiral of natural-resource stress and scarcity.

## New Models of Consumption

Consumption patterns also influence relationships between population and natural resources. If every one of the world's 6 billion inhabitants consumed as much paper and petroleum as do each of the United States' 278 million inhabitants, the damage to forests, soils, air and climate would be catastrophic. Unless we are willing to tolerate an economically divided world, we must transform the model of the good life that now dominates the airwaves worldwide. The logical place to begin that transformation is within the wealthy countries themselves.

The role of consumption in environmental change, however, is impossible to disassociate from population, the size of which determines how much per capita natural-resource consumption can be sustained in an equitable society without extremes of income and consumption. Over short time periods, growth in per capita consumption may well be more decisive a factor in environmental degradation than population growth. Over the long term, the increase of the human species from a few million to several billion individuals has made per capita consumption levels the environmental issue they are today. It is no accident, for example, that the industrial revolution began in the 18th century but that the rise of carbon dioxide concentrations in the atmosphere became dramatic only after world population had climbed beyond 1.5 billion people in the early 20th century. Something will have to change to accommodate the long-term growth of human appetites and activities, and a stabilized population and more sustainable models of consumption are both essential to such a shift.

## Managing Human Interactions

The role of population growth is also impossible to separate from the management of human affairs by governments and other legal, social and economic institutions. Most of the charts in this report consider how much of particular natural resources are available to each person in a country. Others show how much of a resource people are actually extracting from the earth, processing, using and disposing. But mediating the flow of natural resources between the earth and human beings are the social regulating valves known as *institutions.* These may be governments and their policies and programs. They also may be rules of law, economic markets, and such legal principles as the right to hold and dispose of property.

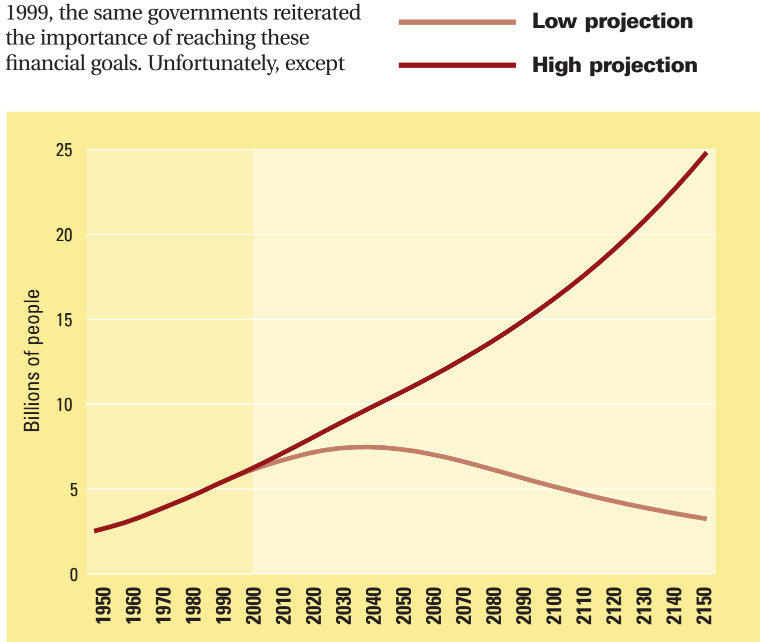
The development of these social structures and processes plays a critical role in the management and conservation of natural resources worldwide. Institutions may or may not work well. Acknowledging disparities in institutional development is essential to understanding the effects of population change, and indeed population change itself plays important roles in institutional development.

## Population and Hope

Future historians may see the 20th century as a demographic anomaly—seven decades of accelerating population growth, unlike any previously experienced, followed by three of subsiding growth as use of contraception spread around the world. There is no certainty about future trends, however. And barring catastrophe, human population will continue expanding for decades to come. The planet's water and land resources will provide less amply for each person, and environmental problems will become more challenging to resolve. At what level and in what decade population growth halts, and what kind of societies witness this peak, will depend very much on how seriously governments and other social institutions take the commitments agreed to at the International Conference on Population and Development (ICPD) in Cairo in 1994.

In Cairo, the governments of the world agreed on a set of policies that could lead to a stabilized world population but which also make sense on other grounds. The relatively inexpensive strategies endorsed at this meeting are worth supporting regardless of population's role in environmental or human well-being. The strategies are grounded not in demographic objectives but in fostering the development of each person's capacity to make major life decisions for herself or himself, decisions such as how long to stay in school or when to have a child. In Cairo, the governments of 179 nations agreed that an estimated $17 billion annually by the year 2000 (rising to $21.7 billion by 2015) would be required to assure universal access to basic reproductive health services within 20 years. Five years later, in 1999, the same governments reiterated the importance of reaching these financial goals. Unfortunately, except

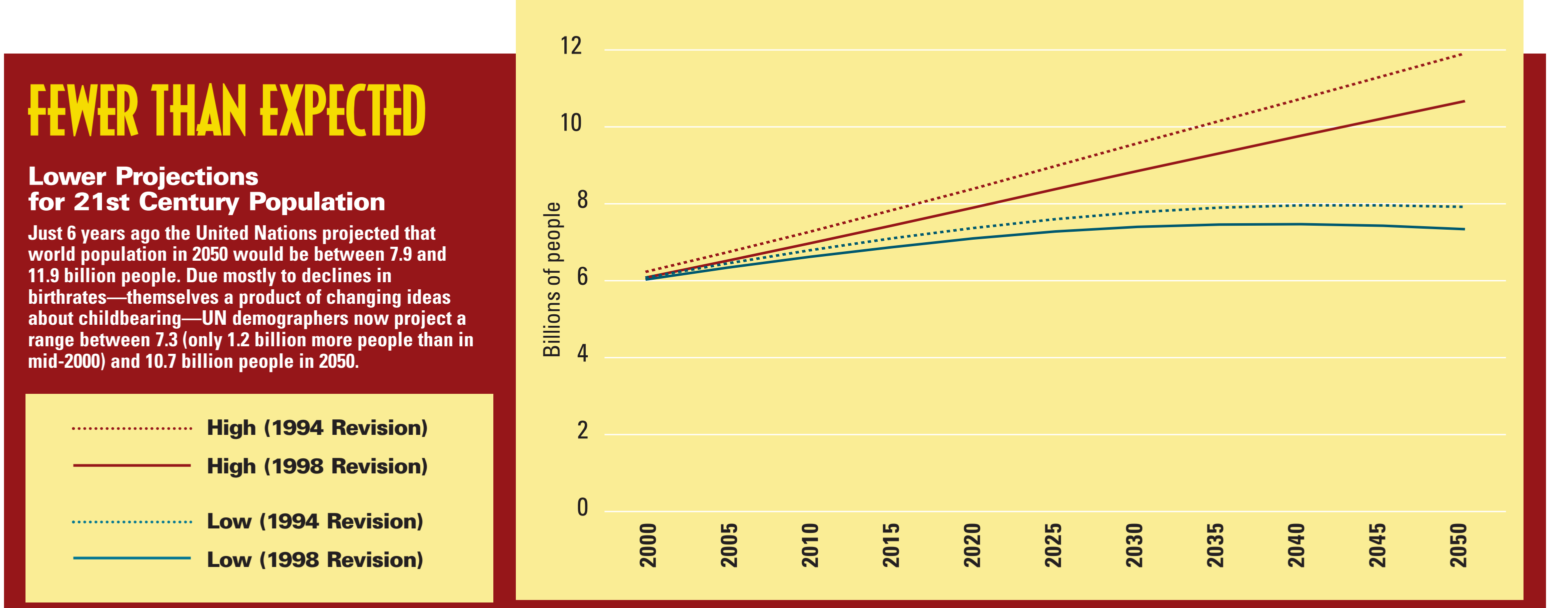
**The Range of Possibilities: World Population Trends and Projections, 1950-2150**



# FEWER THAN EXPECTED

## Lower Projections for 21st Century Population

**Just 6 years ago the United Nations projected that world population in 2050 would be between 7.9 and 11.9 billion people. Due mostly to declines in birthrates—themselves a product of changing ideas about childbearing—UN demographers now project a range between 7.3 (only 1.2 billion more people than in mid-2000) and 10.7 billion people in 2050.**




for a handful of donor- and developing-country governments, most have failed to provide their share of this total. In the United States, ideological divisions within Congress have resulted in this country falling far short of its needed contribution. Unless such trends reverse, reproductive health services will remain unavailable to many of the world's poorest people. And the projected declines in fertility and population growth that many experts point to as the likely future simply will not occur.

The primary objective of reproductive health care providers is not to alter global demographic trends but to improve the lives of individuals directly. Access to good reproductive health care—as well as to decent schools, and to opportunities to earn a living—can mean the difference between happiness and misery, sometimes even between life and death, for women and their children. But an important side benefit of addressing these individual needs is that population growth will slow and eventually end for the best of reasons: higher proportions of intended pregnancies, leading to fewer births, occurring later in women's lives.

Most hopeful of all is the growing possibility that population will actually peak in the new century, perhaps at fewer than 8 billion people, compared to 6 billion today. While increases in death rates cannot be ruled out as a contributing factor to the slowing of population growth, declines in birthrates are far more influential today. Had birth rates not fallen in the latter half of the 20th century, world population would be 2.3 billion higher than it is today.[3] If governments and other institutions commit to reducing rates of both birth *and* death, population growth will continue to slow and eventually end.

## Away from Scarcity

As population stabilizes, so will the per capita availability of finite natural resources. If populations trend downward, governments and resource managers should be in the enviable position of having more water, more soil, more fish, and more forests each year for each person.

Per capita natural-resource consumption, of course, may continue to expand after population stabilizes, but this need not be. Technological change, tax restructuring and evolving perceptions about what constitutes "the good life" can all contribute to reductions in consumption even while income inequalities shrink and poverty eases. The dynamics of consumption, however, operate differently from those of population. Consumption patterns are more immediately subject to influence than are population trends, which to a large extent are rooted in the birth rates of the past. And population can become so large that even minimal per capita consumption levels overwhelm the environment.

## Aging Populations

Easing population growth carries other implications for society. An aging population, for example, is the price a country with falling birth and death rates pays for longer lives in a less crowded world. The process can strain social security and health care systems, but the solution is not to encourage a process—population growth—that cannot go on indefinitely on a finite planet.

To fear an end to population growth is to fear the inevitable. And in all likelihood nations can adjust to stable or even gradually shrinking populations, and the aging that accompanies them, more easily than nations can indefinitely manage water scarcity, food insecurity or human-induced biodiversity loss and climate change that grow more acute with each passing decade.

## Action at the Global Level

The policies that contribute to the slowing of population growth are tested and cost-effective. **Improving access to a range of high-quality contraceptive services** remains a central strategy for closing the gap between reproductive intentions and outcomes. Lack of such access is a primary reason that today nearly two out of every five pregnancies are unintended, and that more than 150 million women do not want to become pregnant but are not using any form of contraception. Similarly, **making sure that all girls and boys everywhere complete secondary school** not only improves human development and health outcomes, but also discourages early and frequent pregnancy and thus contributes powerfully to slower population growth. The same is true of **improving opportunities for women to find paying jobs or start their own businesses.**

There is a powerful synergy between policies that encourage these outcomes and the stability of both the natural environment and the institutions that preside over human affairs. The environment may be a pristine forest and its creatures, a stable global climate, or simply the clean water and productive soil a farmer needs to care for her family. The institutions are governments, courts, financial institutions and the laws and other arrangements that connect people to each other. And as the ICPD Programme of Action recognizes, in an increasingly democratic world, it will take informed and motivated citizens to push governments to do the right thing, to live up to their obligations and commitments on the environment, population and development.

International agreements provide benchmarks for performance in these areas. In particular, **governments should support and fund the social investments called for by the Programme of Action** of the ICPD, which both focus on women's well-being and promise to contribute to slower population growth and the conservation of critical natural resources. When projecting future changes in environmental conditions, **environmental and policy analysts should take into account scenarios suggested by the full range of population projections** published by the United Nations Population Division and others, rather than merely those based on middle projections. **Both governments and non-governmental organizations should consider integrated, community-based approaches** that improve both natural-resource conservation and access to reproductive health services.

## Action at the Local Level

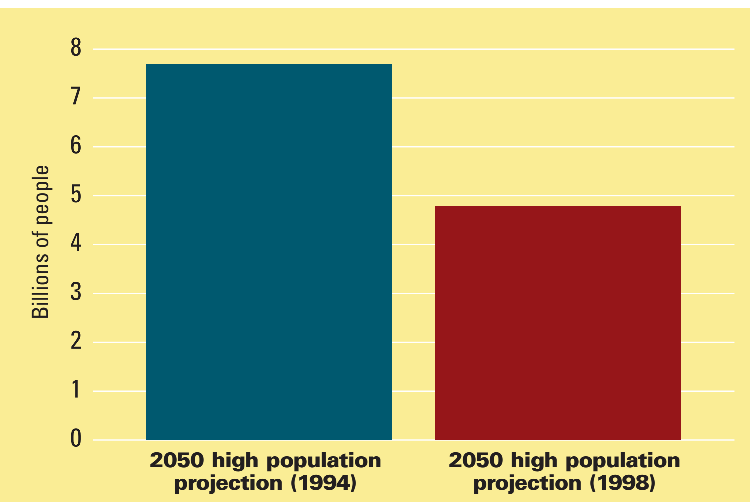
Individuals, too, can help bring about a world that is more secure and more supportive of life, health and happiness. **They can educate themselves on population dynamics, consumption patterns,** and the impact of these forces on natural resources and the environment. They can be socially, politically and culturally active to elevate the issues they care about. They can **become more environmentally responsible** in their purchasing decisions and their use of energy and natural resources. And individuals and couples can **consider the impacts of their reproductive decisions** on their communities and the world as a whole.

There is no longer any doubt that these two seemingly disparate subjects—population and environment—belong together. The turn of the millennium is an ideal moment to consider the long time periods over which this linkage operates. And it reminds us that the goal of environmental conservation is a lasting harmony between human beings and the natural world. Historically, the rapid change to which population growth contributes no doubt provided a stimulus for human development and evolution. But as environmental constraints become more pressing and obvious, development and evolution are better served by populations that are stable or even slowly declining than by persistent growth that may well end only through unwelcome increases in death rates.

We live today in a world that often seems divorced from nature and its resources, but this is an illusion. Human well-being in the coming centuries will depend in large part, as it always has, on the abundance and cleanliness of water and soil, the expanse and living diversity of forested land and marine waters, and the relative stability of the planet's climate. All of these will depend in large part on the pace—and the end point—of human population growth in the 21st century. And those, in turn, will have much to do with the capacity of couples to plan their families and of women to manage their own destinies. Helping to expand these capacities is worthy work for all who care not just about population and women health, but about nature, the human condition and the future of both.

### Less Natural Resource Scarcity than Expected

**Population projected to live in countries where per capita renewable freshwater availability will be less than the water-stress benchmark of roughly 1,700 cubic meters, based on the 1994 and 1998 UN High Projections.**




[1] United Nations Population Division, *Briefing Packet: 1998 Revision, World Population Estimates and Projections* (New York: United Nations, 1999) p. 2.

[2] United Nations Development Programme, *The Human Development Report 1999* (New York: United Nations, 1999), p. 130.

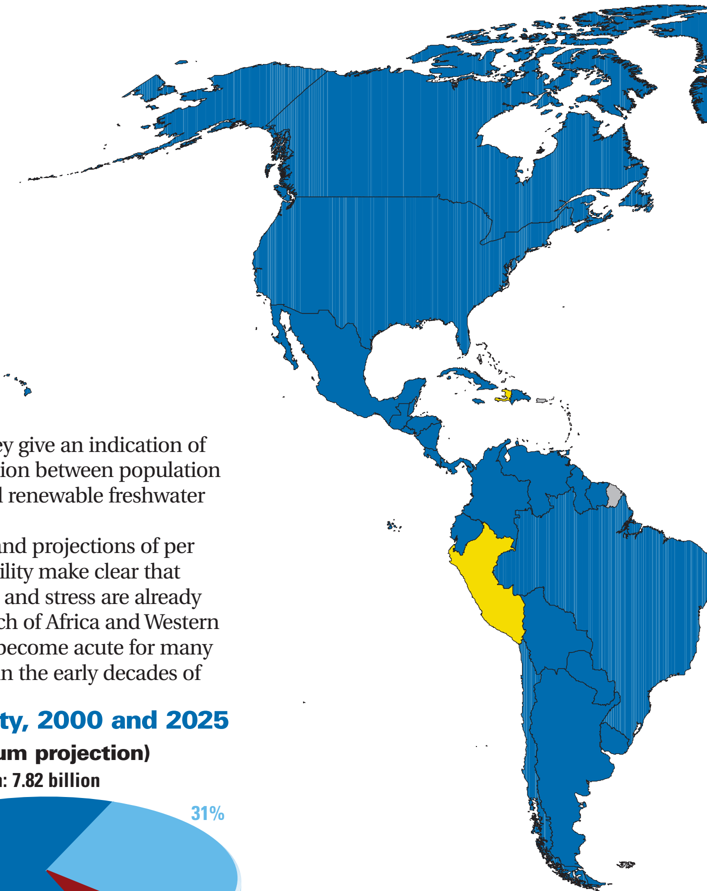
[3] Patrick Heuveline, "The Global and Regional Impact of Mortality and Fertility Transitions, 1950-2000," *Population and Development Review* 25, No. 4 (1999), 688.

# PEOPLE and WATER

**F**resh water is essential to health, economic development and life itself, yet there is no more of this critical natural resource today than in the distant past. Less than 3 percent of the planet's water is salt-free, and less than a third of that is liquid. Less still is *renewable*, continually available because it is refreshed by the earth's hydrological cycle as rain and snow falling on land. Renewable fresh water is all that people can rely on over the long term. (Only 0.2 percent of all water used worldwide comes from desalination.) And hydrologists have measured this water, watershed by watershed, nation by nation.

As human populations grow in any watershed or nation, less renewable fresh water is available for each person. Hydrologists use ratios of available fresh water to population to track trends in water scarcity and stress, conditions that are especially threatening to the development of poorer nations. As a general benchmark, when there is less than 1,000 cubic meters of renewable fresh water (1,000 metric tons, equivalent to 264,000 gallons) per person per year, the country is said to experience *water scarcity*. If the figure falls between 1,000 and roughly 1,700 cubic meters, the condition is *water stress*. In either of these categories, most developing countries find they are either over-exploiting non-renewable sources of water or paying for "virtual water" through food imports. The terms stress or scarcity do not take into account actual physical access to water sources, or the quality of the water, or the irregularity of availability due to drought and storms or wet and dry seasons. Nor do they measure inequality of access between rich and poor, urban and rural. The terms do, however, represent a starting point, and they give an indication of the close relation between population dynamics and renewable freshwater availability.

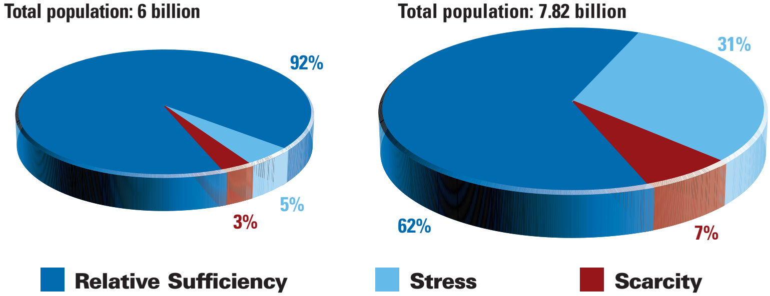
Estimates and projections of per capita availability make clear that water scarcity and stress are already issues for much of Africa and Western Asia and will become acute for many more people in the early decades of



## World Population by Freshwater Availability, 2000 and 2025

**2000**
**Total population: 6 billion**

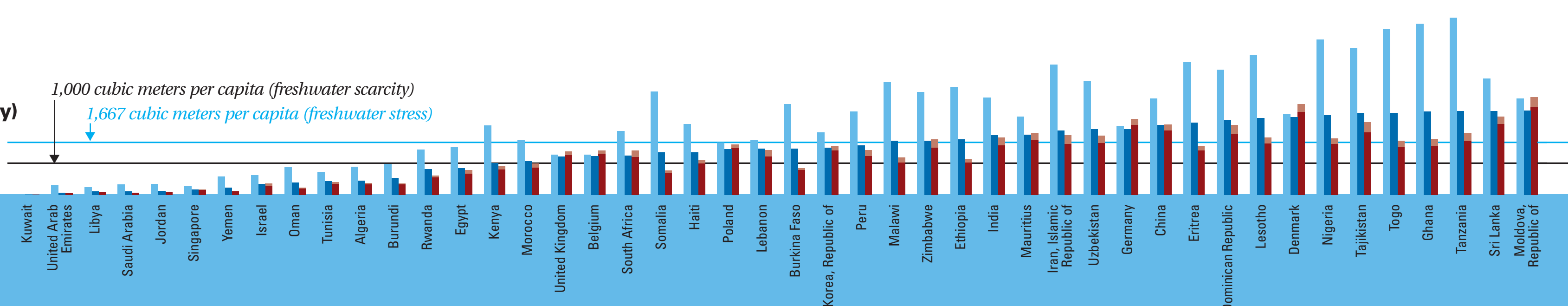
**2025 (medium projection)**
**Total population: 7.82 billion**

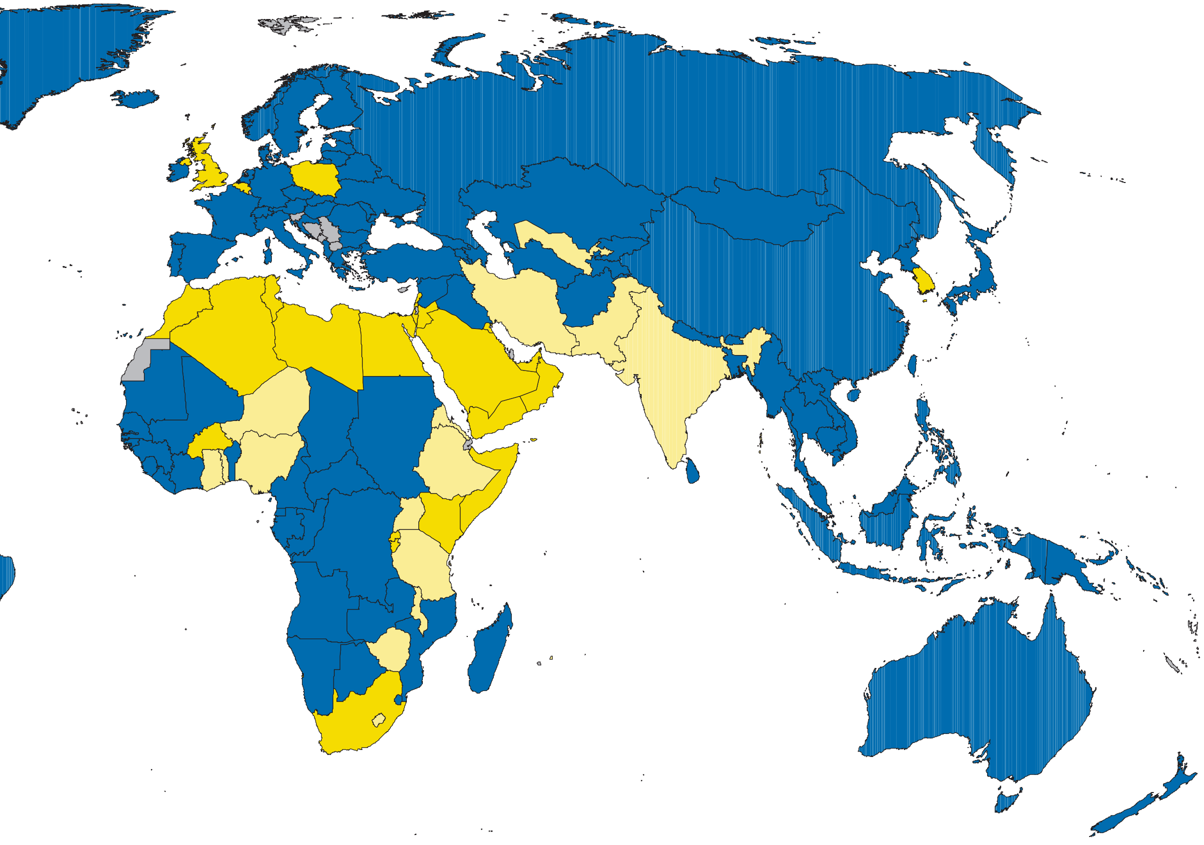



## Annual Renewable Fresh Water Per Capita, 1975, 2000 and 2025 (projected)

**Fresh water renewed continually through the global water cycle is a finite natural resource that can be quantified for each country. Water engineers and planners use benchmarks of availability based on how much renewable fresh water is available to each inhabitant per year. Water scarcity is defined as less than 1,000 cubic meters per person. The less-severe condition of water stress is defined as between 1,000 cubic meters and roughly 1,700 cubic meters per person. The bars illustrate each nation's per capita availability for the years indicated, with the bar for 2025 showing both the low (light red shading) and high (dark red shading) population projections. ▼**

- **1975**
- **2000**
- **2025 (high population projection – greater scarcity)**
- **2025 (low population projection – less scarcity)**





◀ **Water-Short Countries in 2000 and 2025**

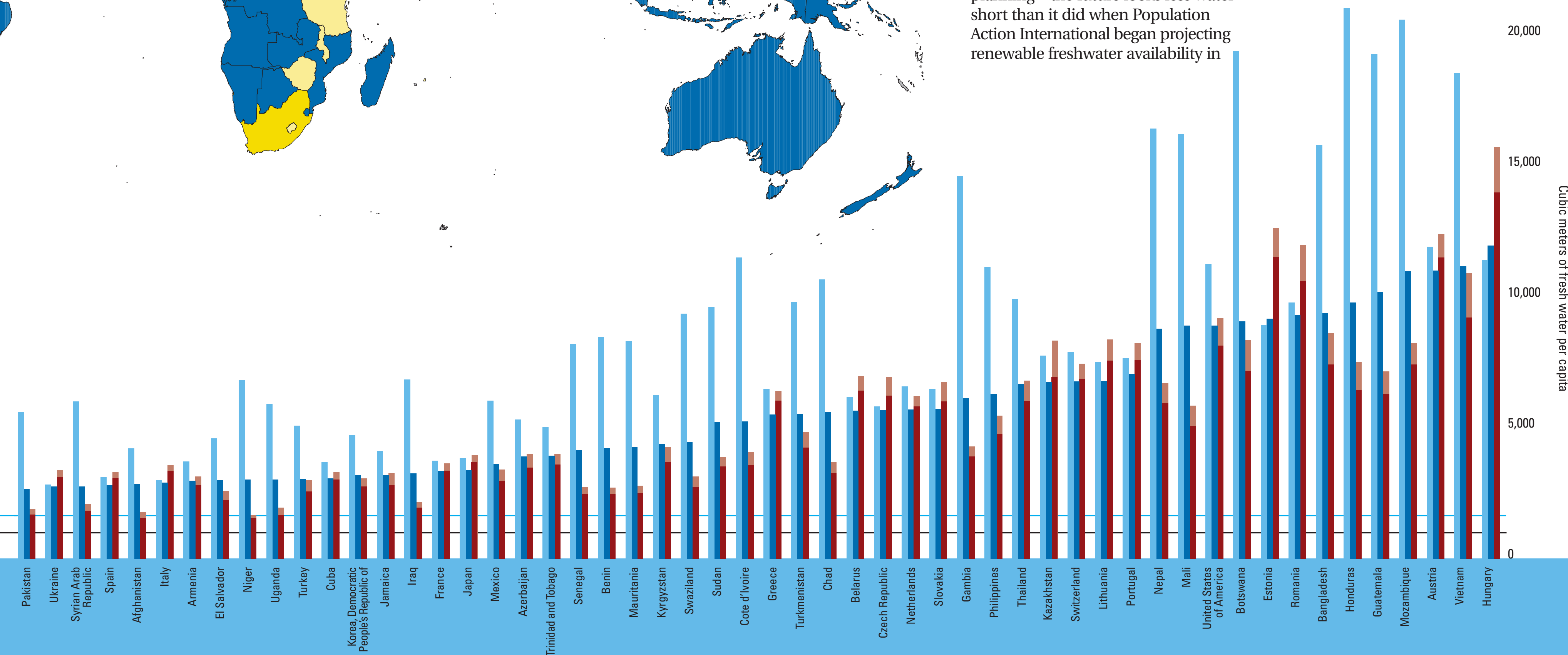
**Water-stressed and water-scarce countries in 2000**

**Additional water-stressed and water-scarce countries by 2025**

**No data available**

the 21st century. Based on the latest available population and freshwater data, somewhere between 2.4 billion and 3.2 billion people may be living in either water-scarce or water-stressed conditions by 2025, depending on future rates of growth, compared to 505 million people in the year 2000.

There is one hopeful sign, however: Because the growth of world population is slowing significantly—in large part due to the greater use of family planning—the future looks less water-short than it did when Population Action International began projecting renewable freshwater availability in 1993. Then, it appeared that between 2.8 billion and 3.3 billion people would be living in water-scarce countries in 2025. The impact of lower projected population is even more evident when considering the world of 2050. [See “Less Natural Resource Scarcity than Expected” on p. 7.] ▮▮I



# PEOPLE *and* LAND

At the turn of the new century, grain and other basic food prices are relatively low, suggesting that global supply exceeds demand—at least for the moment, and with the use of some cropland and farming practices that cannot long be sustained. Yet roughly 800 million people are malnourished, in most cases because they cannot afford to buy enough food grown elsewhere. Most live in communities and countries that once were self-sufficient in food.

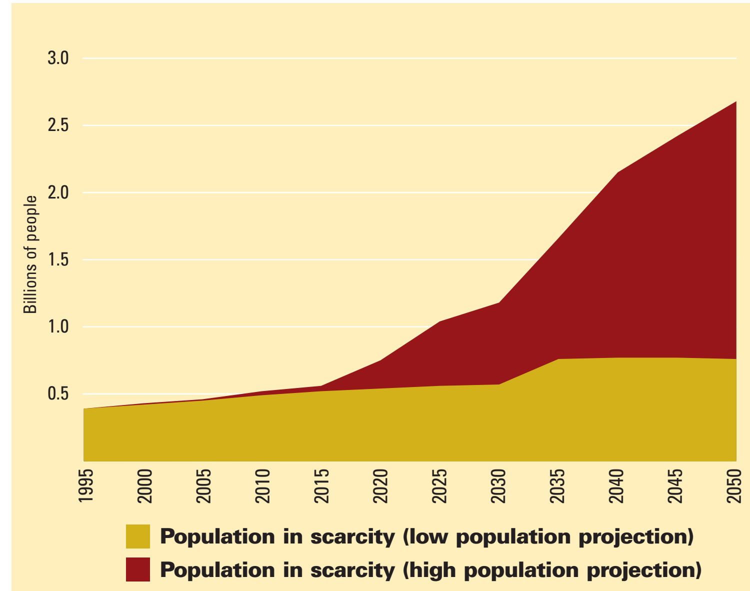
Dependence on imported food continues to increase with world population, especially in sub-Saharan Africa. Food-dependent nations need hard currency, earned by producing something else the world values, to pay for imported food, or they must rely on the surplus stocks—and fickle generosity—of food donors.

Globally, the net amount of land under crops is growing much more slowly than population, and the supply of land that could be easily converted to sustainable cultivation is limited. The per capita supply of farmland is thus falling as population grows. Farmers keep pace by increasing crop yields, extracting more production from each unit of land. (The need to increase production is one argument offered by advocates of the genetic modification of food.) Nonetheless, per capita grain production has been relatively stagnant for more than 15 years.

Much of the cost of today's food production will be borne by tomorrow's people and environment. In industrialized countries, farmers rely on polluting chemicals and on fossil fuels whose combustion contributes significantly to global climate change. In poorer countries, farmers mine nutrients from their soil or struggle to keep it from eroding away. Farmers everywhere irrigate land with groundwater that is disappearing further into the earth or may soon be sold to higher bidders in urban areas [see "People and Water"]. Some of the best farmland is disappearing under new pavement and housing, and the world's rural poor increasingly find themselves forced to convert forest into cropland. None of these practices can continue indefinitely.

Because cropland varies in physical and climatological characteristics, a single benchmark of cropland scarcity is hard to determine. Population Action International has relied on the historical work of Canadian geographer Vaclav Smil to come up with the extremely conservative figure of 0.07 hectares per person as the dividing point between scarcity and relative sufficiency.[1] This appears to be a bare minimum of fertile cropland required to feed one person a vegetarian diet with no use of pesticides or other chemical inputs. Countries with less land per capita have little hope of food self-sufficiency without major investments in agriculture that many cannot afford.

**Population Projected to Live with Arable Land Scarcity, 1995-2050**




**Arable Land Per Capita, 1975, 2000 and 2025** (projected)

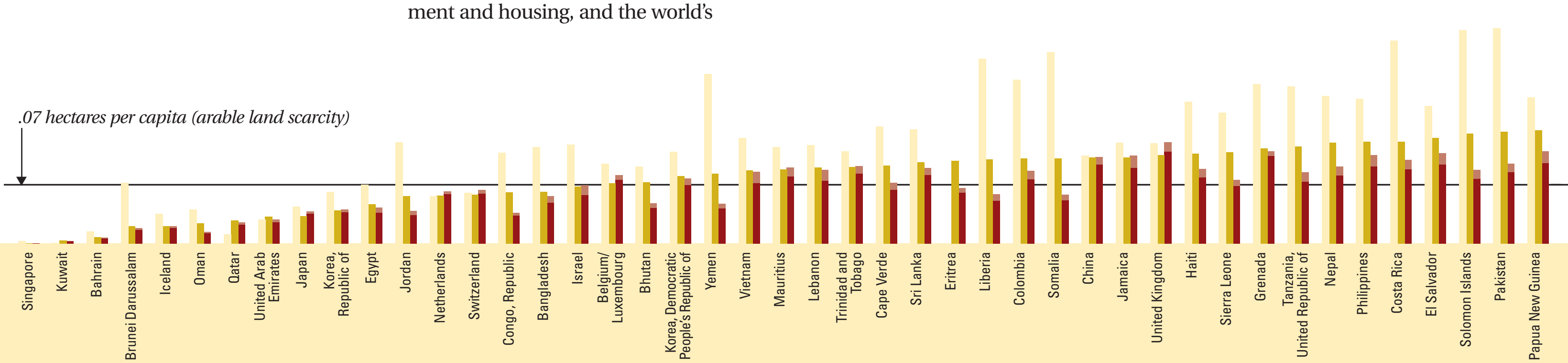
**The United Nations Food and Agriculture Organization defines arable land as cropland or land cultivated with crops, plus land left fallow or used as pasture for less than five years. Each bar represents the amount of such land available to each inhabitant of each country. This is derived from a nation's total arable land divided by its total population, not just its farming population. The 2025 bar illustrates projected arable-land availability under both the low population projection (light red shading) and the high projection (dark red shading).** ▼

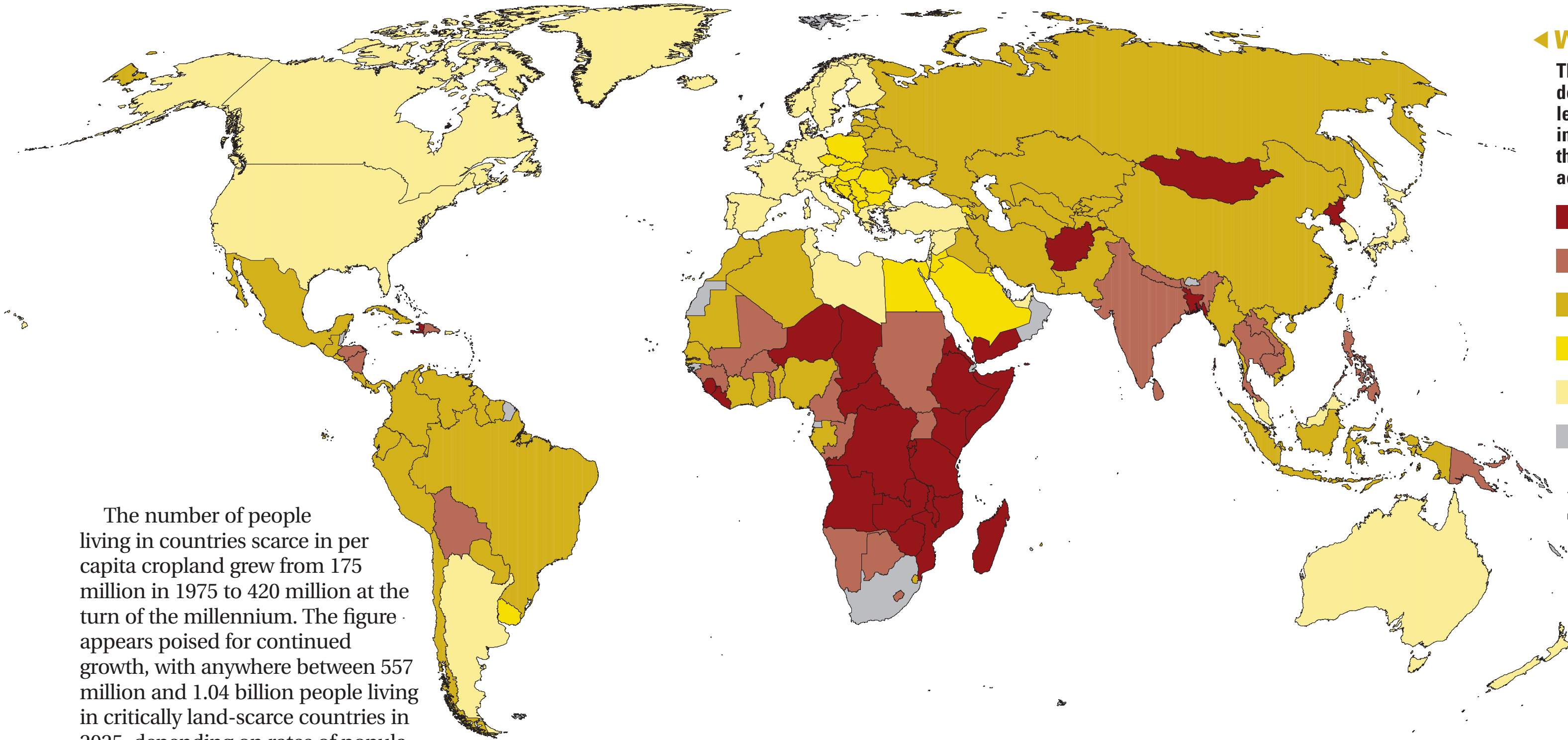
**1975**

**2000**

**2025 (high population projection – greater scarcity)**

**2025 (low population projection – less scarcity)**



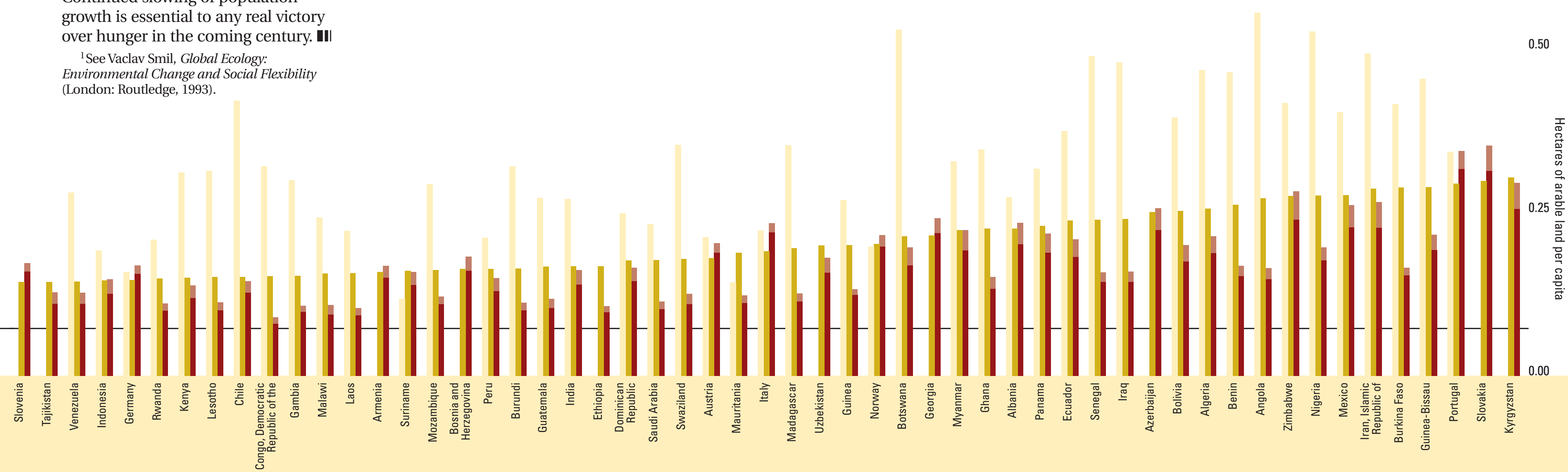



**World Hunger, 1997**

**The United Nations Food and Agriculture Organization defines adequate nourishment as consumption of at least 2,100 kilocalories (often called calories informally) per day. Countries are shaded to illustrate the proportion of their population who do not have access to enough food to satisfy this requirement.**

The number of people living in countries scarce in per capita cropland grew from 175 million in 1975 to 420 million at the turn of the millennium. The figure appears poised for continued growth, with anywhere between 557 million and 1.04 billion people living in critically land-scarce countries in 2025, depending on rates of population growth over that time period. Continued slowing of population growth is essential to any real victory over hunger in the coming century. ▮▮|

[1]See Vaclav Smil, *Global Ecology: Environmental Change and Social Flexibility* (London: Routledge, 1993).



# PEOPLE and FORESTS

More than just places to hike and camp, the world's forests provide goods and services essential to human and environmental well being. At the turn of the new millennium, when we need them more than ever, forests in many parts of the world are disappearing faster than ever before. As population has grown and forested land has retreated, the ratio of forests to human beings has declined significantly. Today it is less than half what it was in 1960. Much more efficient consumption of forest products and the eventual stabilization of human population will be needed to conserve the world's forests in the 21st century.

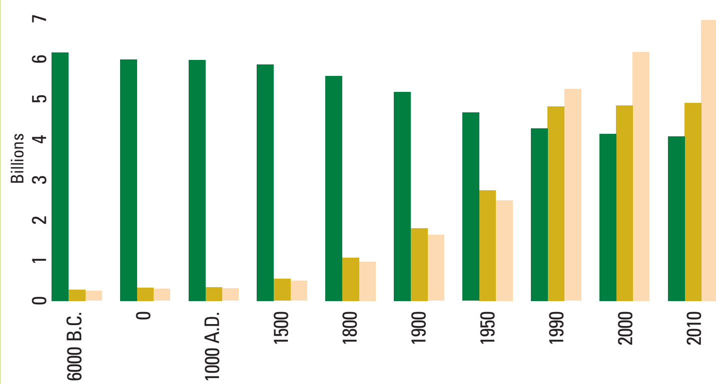
Trees themselves are a critical natural resource. Wood is one of the most widely used materials for construction and housing, and nearly 3 billion people depend on wood as their main source of energy. Fiber from trees is used to produce the paper on which most of the world still depends for education and communication. But forests also harbor over half of the world's plant and animal species, making them a genetic resource that could fuel advances in medicine and food production for generations to come. Healthy forests enrich soils, filter sediment from water, and discourage flooding by absorbing and then slowly releasing vast quantities of water. By removing vast amounts of heat-trapping carbon dioxide from the atmosphere, growing forests also help regulate the global climate. We cannot accurately assess the cost of losing any specific tract of tree-covered land, but it would be foolish to believe that the ongoing retreat of the world's forests is a low-risk tradeoff for economic development and a healthy environment.

Even countries that have historically had few or no forests utilize the services of forests elsewhere, whether through imports of wood products or through indirect environmental benefits. Forestry experts increasingly consider the ratio of forests to people in assessing the development prospects of poorer countries. Some have suggested 0.1 hectare per person—roughly a quarter acre—as a benchmark of the forest cover (as defined by the United Nations Food and Agriculture Organization) needed by most low-income countries to supply essential goods and services that forests provide. Countries in which per capita forest cover falls below this level rely heavily on wood imports and typically risk high levels of soil erosion, flooding and landslides.

The bar chart on these pages ranks the 100 countries that currently have the lowest levels of forest cover per person. (Some of these countries have not had significant forest cover in historical times and may have adapted reasonably well to their lack of wood and other forest resources.) The chart also projects each country's per capita forest availability in 2025, applying the UN medium population projection under the assumption that current trends in forest area change continue. Using the 0.1 hectare benchmark reveals that 1.8 billion people live in 40 countries with critically low levels of

## Historical and Projected Changes in Land Use and Population

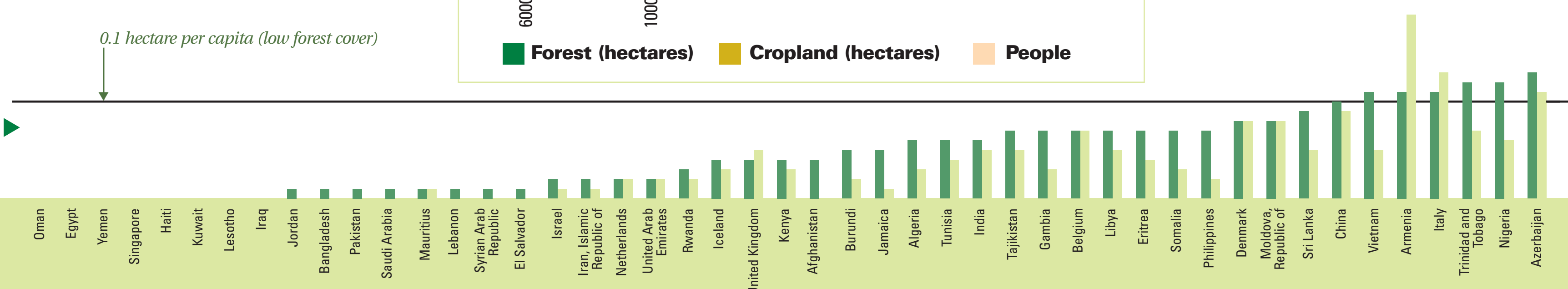
**Over the span of human history, the greatest cause of forest loss has been the development of sedentary agriculture, driven by the need to feed an increasing human population. This figure reveals the dramatic declines in forested land that occurred during the 19th and early 20th centuries. The pace of this decline slowed somewhat with the introduction of agricultural technologies such as synthetic fertilizers and high-yield crop strains. (Time series not drawn to scale.)**

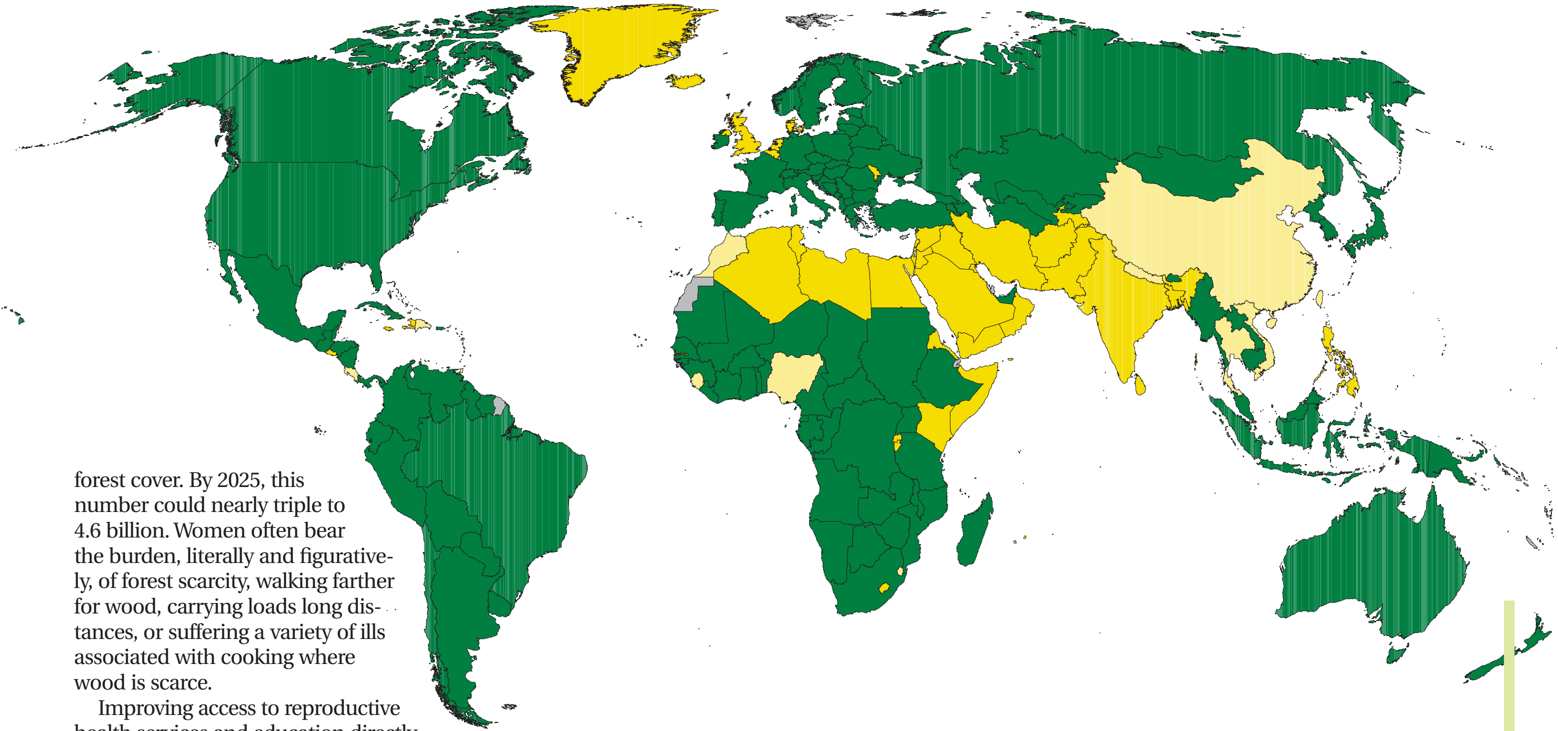



## Per Capita Forest Availability, 2000 and 2025
(medium projection)

**This chart shows the 100 countries with the lowest levels of forest cover per capita, based on current availability. Each country is represented by two bars, the first showing per capita forest cover in 2000 and the second shows per capita forest cover for 2025, based on a continuation of trends in forest area and population change.**

**2000** **2025**

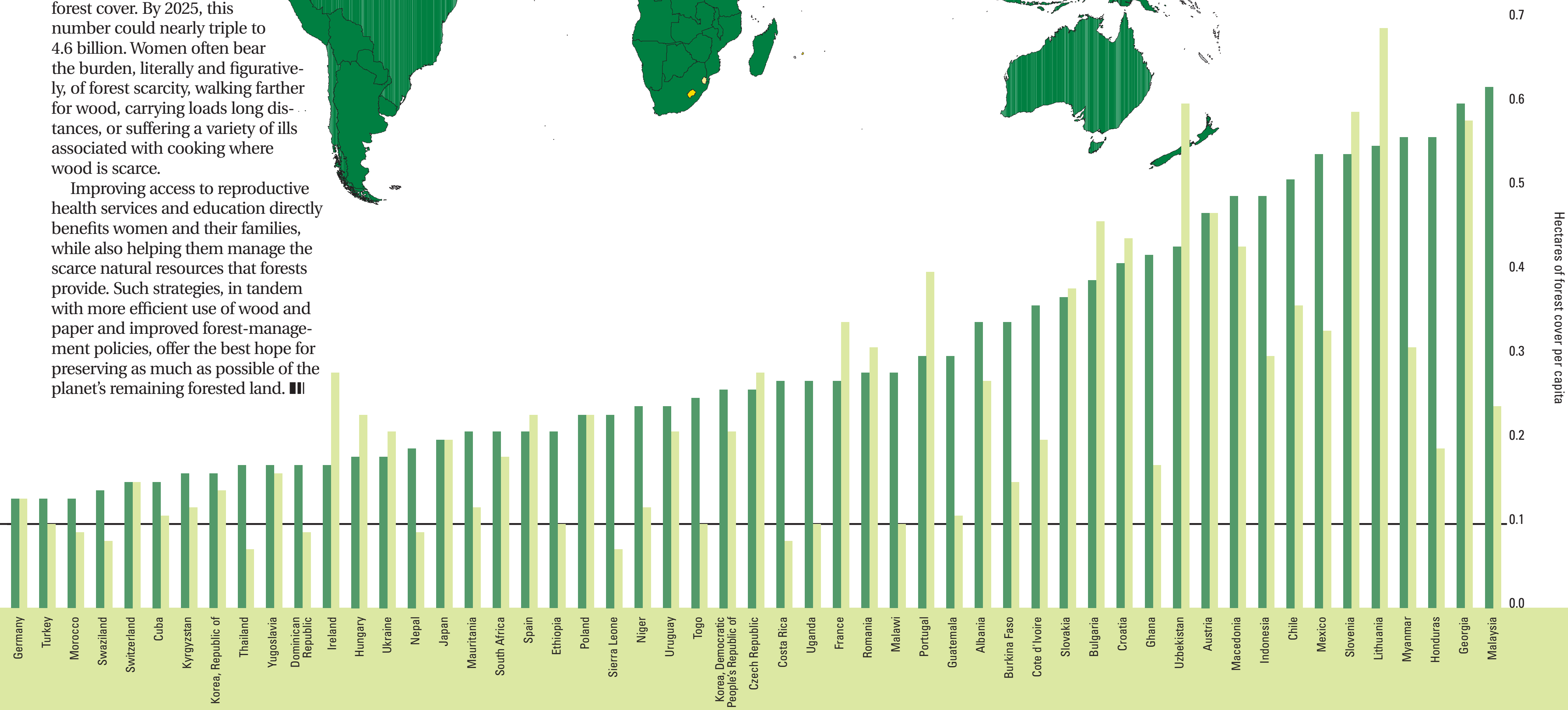





◀ **Countries with Low Forest Cover, 2000 and 2025** (medium projection)

forest cover. By 2025, this number could nearly triple to 4.6 billion. Women often bear the burden, literally and figuratively, of forest scarcity, walking farther for wood, carrying loads long distances, or suffering a variety of ills associated with cooking where wood is scarce.

Improving access to reproductive health services and education directly benefits women and their families, while also helping them manage the scarce natural resources that forests provide. Such strategies, in tandem with more efficient use of wood and paper and improved forest-management policies, offer the best hope for preserving as much as possible of the planet's remaining forested land. ▮▮▮



# PEOPLE and FISHERIES

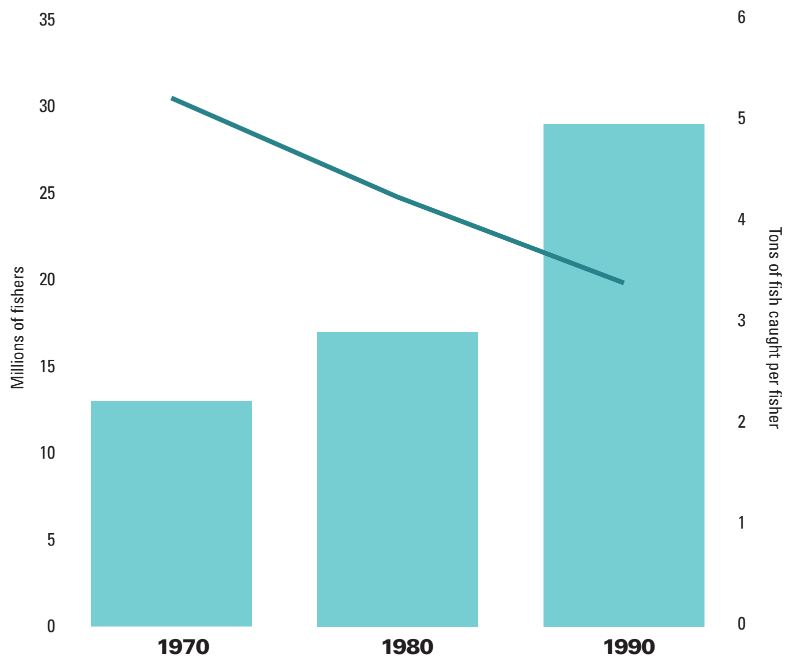
Historically, fish have served as an inexpensive and widely available source of complete protein and essential nutrients, including a type of fatty acid critical to the development of the brains of infants and young children. Current trends in the price of fish, however, cast doubt on how much longer this important food will be widely available to the world's poor.

Based on the available data, it appears that production of fish overall continues to increase roughly in tandem with the growth of human population. These production increases come almost entirely from the rapid expansion of *aquaculture*, the raising of fish either in marine or inland waters, not from any significant rise in the capture of fish in the wild. Aquaculture now provides one fish out of every three the world consumes, but more than two-thirds of the world's farm-raised fish are produced in a single country, China.

The annual global catch of wild fish from oceans, which once kept pace with increasing human demand, appears to be leveling off at just under 90 million metric tons. The composition of the wild catch continues to shift to smaller and less appetizing fish. Some species of fish—bluefin tuna, for example, which has at times commanded hundreds of dollars per kilogram—appear headed for commercial or even biological extinction. Today, 11 of the world's 15 major ocean fishing areas and more than two-thirds of ocean species are in decline and in urgent need of management. According to the UN Food and Agriculture Organization, the world's fishers are fully exploiting 44 percent of fish stocks and overfishing another 16 percent.[1]

The aquaculture industry is growing rapidly and has shown that it can expand global production of fish even as the world's oceans, lakes and rivers yield a smaller catch. Farm-raised fish, however, are not inexpensive enough to

*(continued on page 16)*

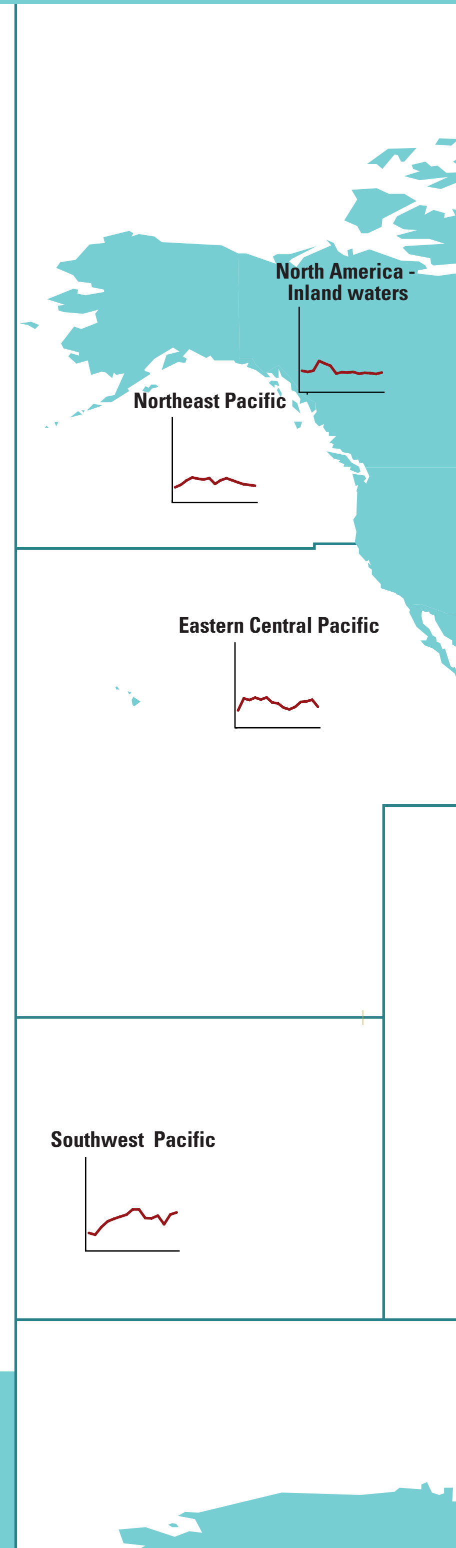


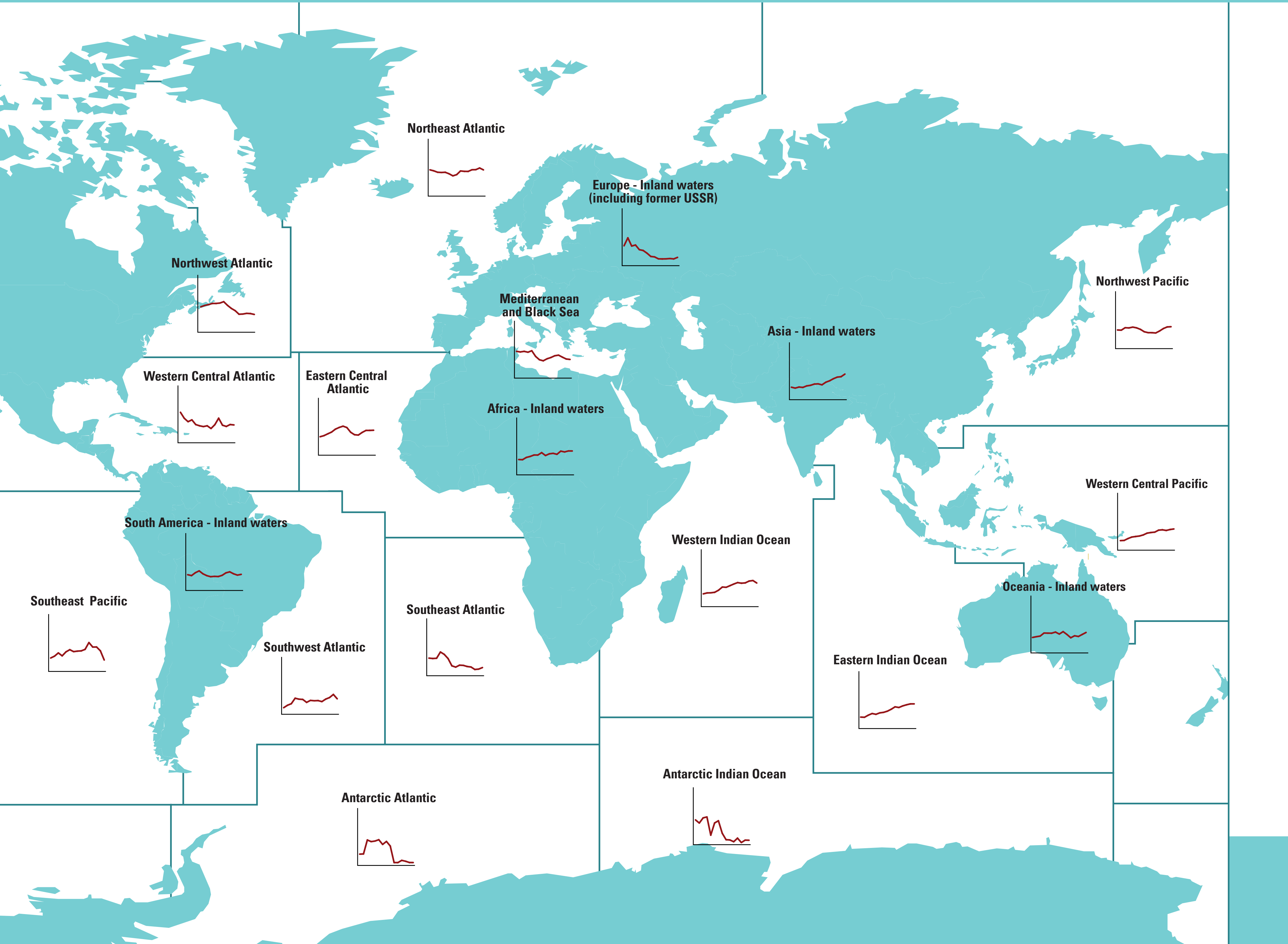

### More Fishers Fishing, Fewer Fish Caught ▶

**Although the number of fishers more than doubled between 1970 and 1990 (vertical bars), the number of fish each fisher caught on average fell 30 percent (line). "Fisher" includes people who are engaged in aquatic life cultivation, inland and marine fishing on a part-time, full-time or occasional basis.**

### The Global Fish Catch, 1984-1998 ▶

**The thumbnail charts of recent trends in the world's major ocean and inland fisheries cover the years from 1984 to 1998 (left to right on the X axis). In order to make the trend lines easier to read, the tonnage scales of each year's catch (the Y axis) are not uniform and do not begin at zero. The charts are thus not comparable among each other but do accurately reflect year-to-year changes in each fishery's catch.**




Northeast Atlantic
Europe - Inland waters
(including former USSR)
Northwest Atlantic
Northwest Pacific
Mediterranean
and Black Sea
Asia - Inland waters
Western Central Atlantic
Eastern Central
Atlantic
Africa - Inland waters
Western Central Pacific
South America - Inland waters
Western Indian Ocean
Oceania - Inland waters
Southeast Pacific
Southeast Atlantic
Southwest Atlantic
Eastern Indian Ocean
Antarctic Indian Ocean
Antarctic Atlantic

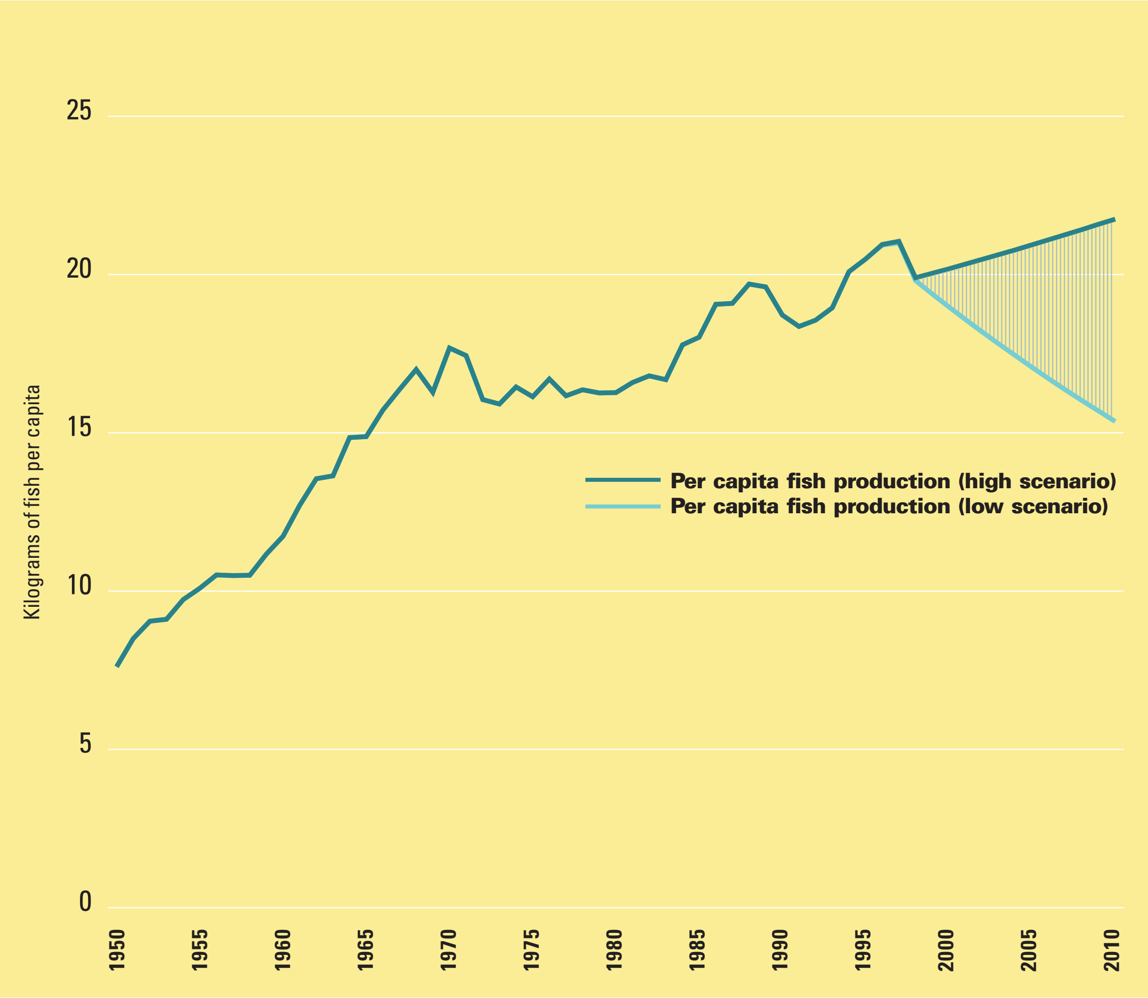
# PEOPLE *and* FISHERIES

**Fish Protein as a Percentage of Total Protein Intake in 26 Countries ▼**


become a major food source in many low-income countries. Over the long term, moreover, aquaculture's continued expansion faces environmental constraints. The investments needed for land, fresh water, and drugs and chemicals to fend off diseases and pests will become increasingly expensive as fish farmers compete for real estate and other natural resources on the world's increasingly densely populated coasts. And, although the industry can be environmentally benign or even beneficial, many fish farms disperse pollutants that include excessive levels of nutrients, agricultural chemicals that can be hazardous in foods, and antibiotics that may contribute to the evolution of drug-resistant diseases.

Many species of fish and shellfish from oceans, rivers and lakes that were once abundant and cheap are no longer either, and to the extent they are substituted, it is with smaller, oilier fish that once were discarded or used mainly as animal feed. International prices for fish roughly quadrupled between 1975 and the early 1990s, compared to increases of roughly 65 percent in the export prices of beef and pork in the same time period.[2] For those in developing countries that rely on fish for a fifth or more of their animal protein intake—China's 1.25 billion inhabitants are one example—the rising price of seafood could threaten nutritional status.[3] The poor tend to shift to lower-quality protein sources and to inexpensive, non-animal foods like cassava that provide lower amounts of protein and key nutrients per kilocalorie consumed.

Other costs of fishing are also rising. Governments spend $20 billion subsidizing a global catch that only draws $80 billion directly from buyers, transferring much of the cost of commercial fishing to taxpayers. Conflicts between fishers increase as stocks decline, demand increases, and fleets sail ever farther from home. In waters close to shore, commercial fishers vie




## Past and Projected Trends in Global Per Capita Fish Production, 1950-2010

**The average production of fish worldwide for each person (fish production combines fish catch and fish culture) has risen unevenly since 1950, but the amount appears to have reached its upper limits as world population approached and passed 6 billion people in the late 1990s. Over the next decade per capita fish production could decline significantly. Projected increases in aquaculture production are likely to make up for losses in ocean and land-based wild fisheries in the face of continued world population growth. The range of uncertainty indicated for the years 1997-2010 represents the difference between two extreme scenarios for per capita fish production. The high scenario (upper bound of range) assumes low human population growth and relatively high fish production, while the low scenario assumes the reverse. The future most likely will be somewhere in between.**

with less-powerful subsistence fishers for limited stocks. In much of the world, the population of fishers is growing and the size of each fisher's catch is declining as finite resources are subdivided among more people.

One illustration of population's role in the rising price of fish amounts to good news. The Food and Agriculture Organization is less pessimistic about future fish price increases today than it was in the early 1990s, largely because world population is growing more slowly today than was projected at that time. Overall demand for fish in the first decade of the 21st century is thus likely to be less strong than previously expected. But the world's growing population and its increasing wealth will all but certainly drive up demand for fish for some time to come. Any long-term solution to the growing imbalance between fish resources and human demands will require not only innovative approaches to conservation and management but also an early end to population growth.

[1] FAO, "FAO Focus on Fisheries and Food Security" (Rome: Food and Agriculture Organization, 1999).

[2] Norman Myers and Jennifer Kent, *Perverse Subsidies: Tax $s Undercutting Our Economies and Environments Alike* (Winnipeg, Canada: International Institute for Sustainable Development, 1998).

[3] FAO, Op. Cit.

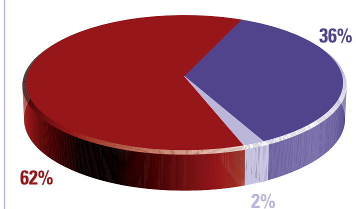
# PEOPLE and CARBON DIOXIDE

The last vestiges of doubt that the world's surface is warming have crumbled, and the single most likely culprit is the increasing capacity of the atmosphere to trap heat close to the earth's surface. Scientists know that this is a by-product of nearly universal human activities such as the combustion of carbon-based fuels and the destruction of trees and forests. These activities release carbon dioxide and other greenhouse gases that push the global climate toward ever-warmer long-term conditions.

Population growth enlarges the scale of these activities and makes it harder to brake global warming using strategies that stress energy efficiency and non-carbon energy sources. The more people there are on the planet, the less each of us can use the atmosphere for waste disposal without contributing to further global warming.

The stark inequities of current emission patterns make the linkage between population and climate change harder to grasp, but the linkage is at work nonetheless. The latest data on population and industrial carbon emissions show global per capita carbon emissions increased slightly in 1996, continuing a trend that has been consistent since 1993, when a four-year period of declining global per capita emissions ended. Inequity within this global emissions average, however, is substantial. One-fifth of the world's population released 62 percent of all measured carbon emissions in 1996, while a different—and much poorer—fifth released less than 2 percent. The United States has the third largest population in the world—growing at 1 percent annually—and ranks fourth in the world in per capita

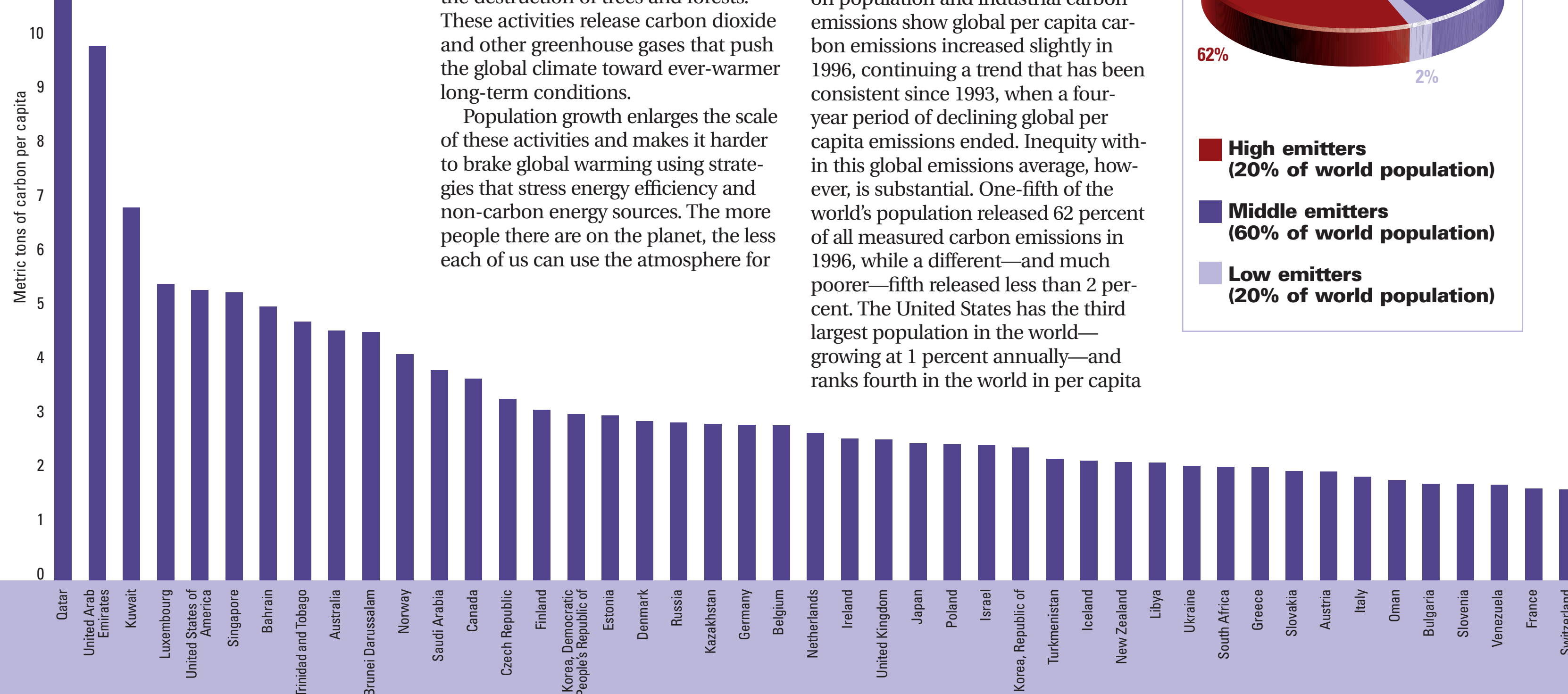
### Atmospheric Overload: Relative Shares of Global Emissions by High, Middle and Low Emitters

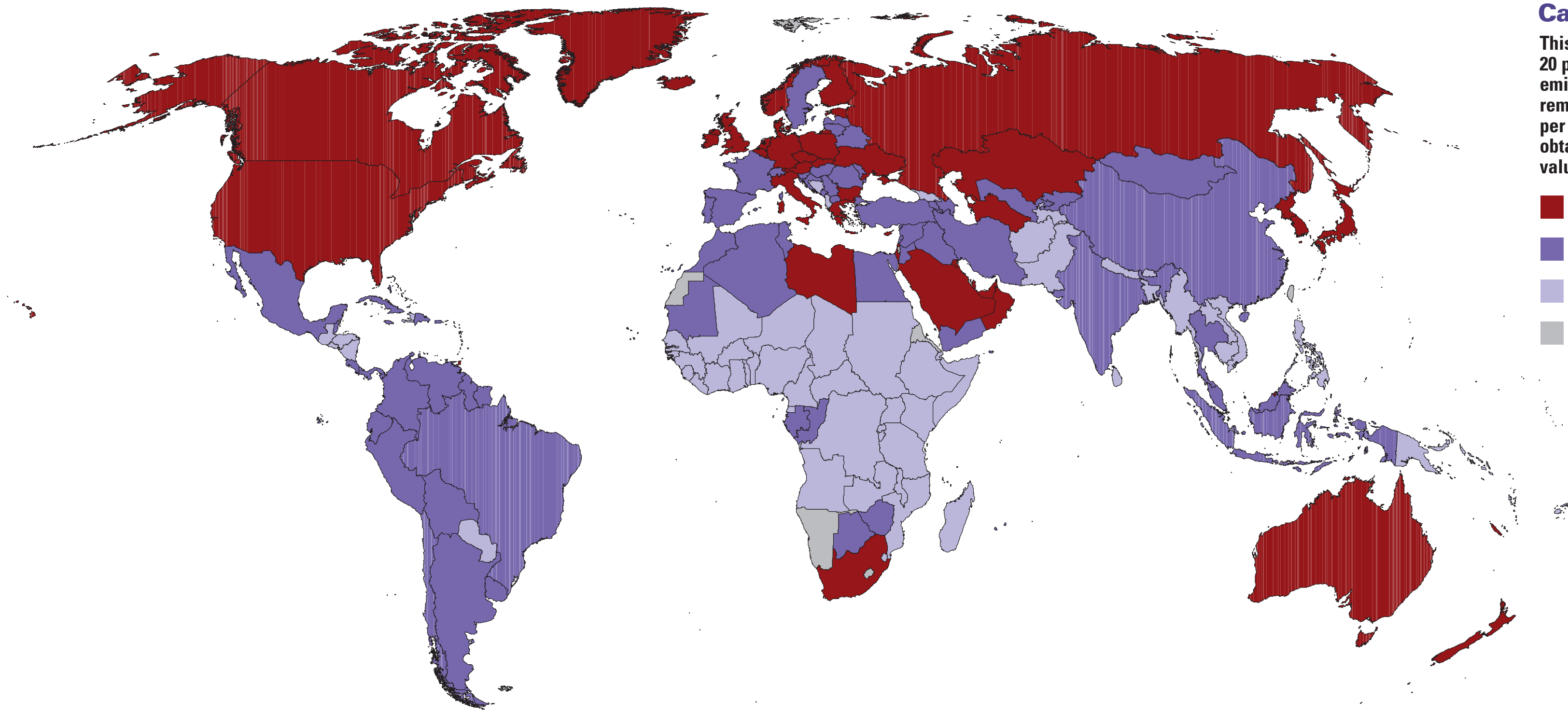



- **High emitters (20% of world population)**
- **Middle emitters (60% of world population)**
- **Low emitters (20% of world population)**

### Per Capita Emissions of Carbon Dioxide from Fossil Fuel Use, 1996

**This chart (and map, opposite) illustrate per capita emissions of carbon dioxide ($CO_2$) from fossil fuel combustion in 1996. These data include a small component from cement production but do not include $CO_2$ emissions from deforestation and other land-use changes.** ▶





**◀ Per Capita Emissions of Carbon Dioxide, 1996**

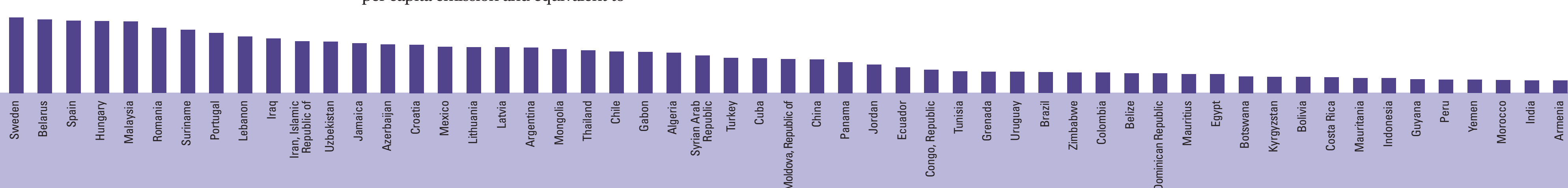
**This map shows those countries in which live the 20 percent highest and 20 percent lowest per capita emitters, with the medium emitters consisting of the remaining 60 percent of the world's population. The per capita weight is provided in carbon values; to obtain weight by $CO_2$ values, multiply the carbon values by 3.664.**

- **High emitters**
- **Medium emitters**
- **Low emitters**
- **No data**

carbon emissions, with 5.37 metric tons of carbon emitted per capita in 1996. The people of most developing countries release a mere fraction of this amount, yet they have the least capacity for addressing the impacts of climate change. Clearly such disparities will need to shrink if the world is ever to cooperate on braking global warming.

When we consider what will be needed to combine reasonably equitable consumption patterns worldwide with climate stability, the role of population becomes apparent. The average global per capita carbon emission that would be needed to stabilize carbon dioxide concentrations in the atmosphere at roughly current levels would be less than half a metric ton (assuming roughly equivalent reductions in the carbon dioxide contributed by deforestation). That's less than one-tenth the 1996 U.S. per capita emission and equivalent to the 1996 per capita emission of a Colombia or Zimbabwe. If world population doubles in the next century, the sustainable per capita emission would drop to about 225 kilograms of carbon, equivalent to the 1996 emission of a Nigeria or Samoa.

Changing the technology of energy production could help reduce per capita emissions, but over the long term a population that grows indefinitely cannot expect to stabilize the global atmosphere or reduce human influence on climate. Both industrialized and developing countries have a huge stake in stabilizing per capita greenhouse-gas emissions at low levels and for shrinking the stark inequities of these emissions. A stable world population is essential to reconciling both of these ambitious goals. ▮▮|

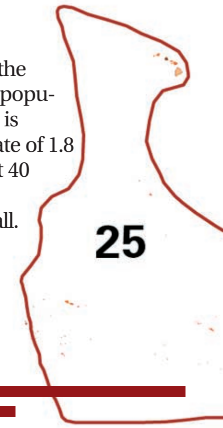


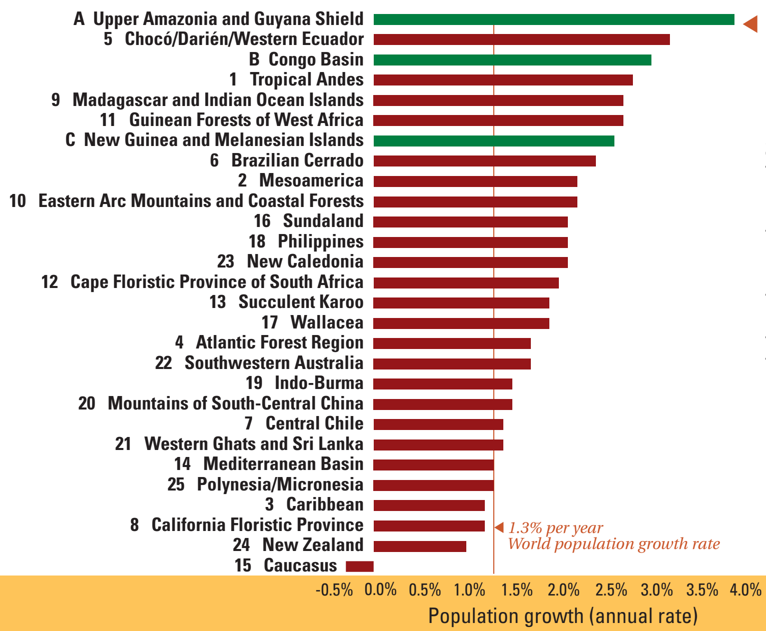
# PEOPLE *and* BIOLOGICAL DIVERSITY

As the millennium turns, plant and animal species are disappearing at rates 1,000 times higher than occurred in the pre-human past. From projected losses of habitat alone, biologists believe that half of the roughly 10 million species on the earth today may go extinct during the next few centuries. More could disappear as a result of invasions of exotic species, pollution, over-harvesting and human-induced global warming. The underlying driver of this unprecedented loss is the expansion of human activities across the landscape, and among the key factors in that expansion is the growth of human population. The pace of this growth in the new century will be critical to the future of biological diversity (called *biodiversity*), as will new approaches to natural-resource consumption that treat the non-human world as the precious asset it is.

In 1995, more than 1.1 billion people, about a fifth of world population, lived in the world's *biodiversity hotspots*. These are 25 areas with rich concentrations of unique species combined with a high threat from human activities. Population density was much greater than in the world as a whole, and in 19 of the hotspots population was growing significantly faster than the worldwide average. The population in all the hotspots is growing at a collective rate of 1.8 percent annually, almost 40 percent faster than the world's population overall.

In addition to the hotspots, there are three *major tropical wilderness areas*, biodi-



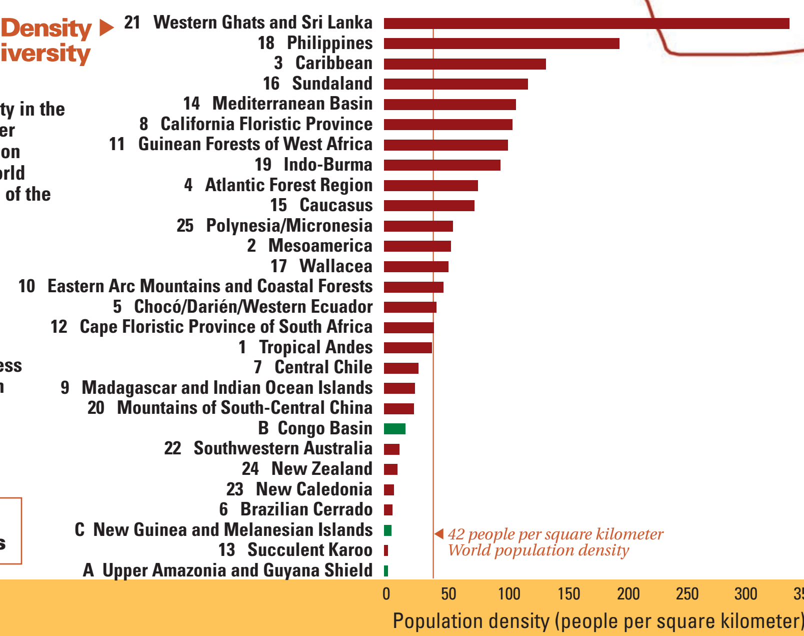

## Population Growth in the Biodiversity Hotspots

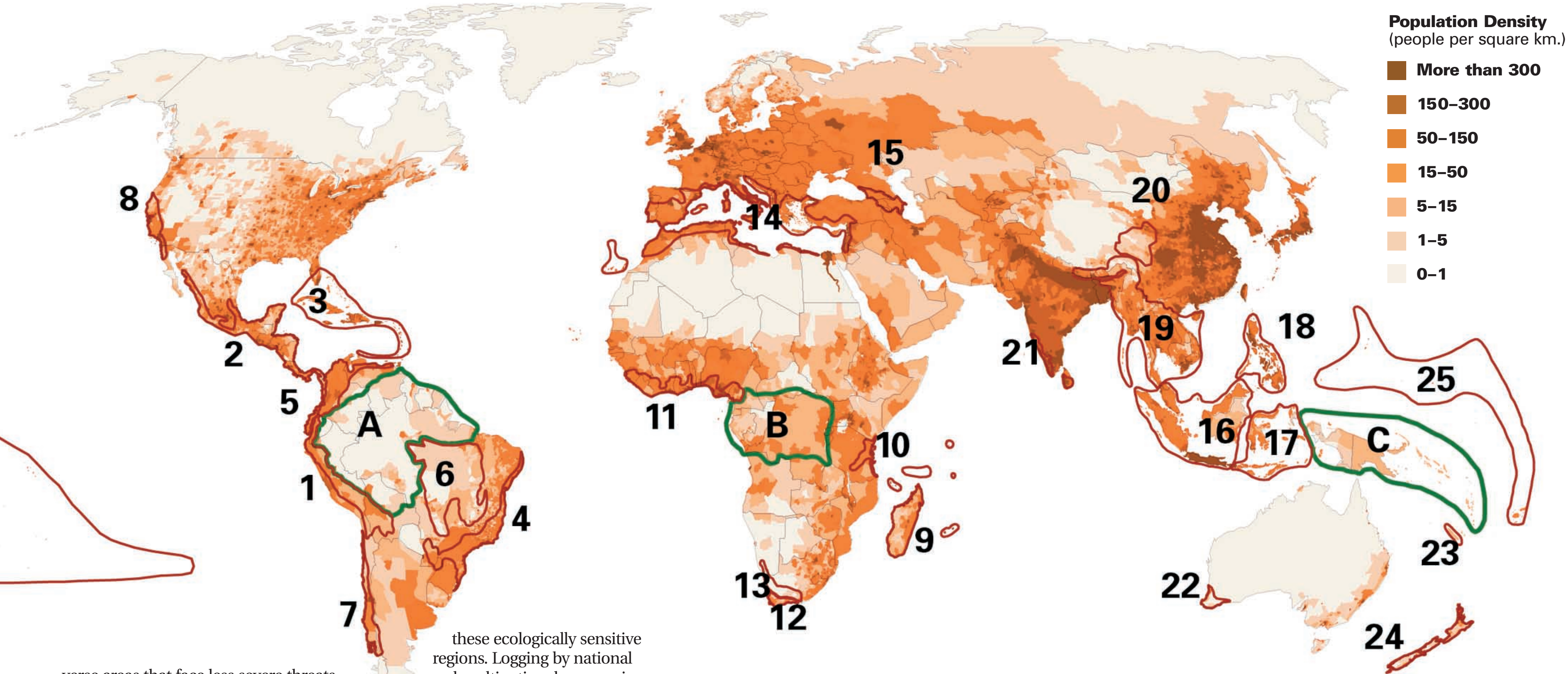
**Human population is still growing in all but one of the 25 hotspots. Populations in the hotspots are growing, on average, at 1.8 percent annually, a rate substantially higher than the average world rate (1.3 percent), and even higher than that of the developing countries (1.6 percent). In the three remaining major tropical wilderness areas, population is growing, on average, at roughly two and a half times the population growth rate of the world as a whole.**

## Population Density in the Biodiversity Hotspots

**Population density in the hotspots is greater than the population density of the world as a whole. In 16 of the 25 hotspots, population density is equal to or greater than the world average. In the major tropical wilderness areas, population densities are relatively low, but increasing rapidly.**

**Biodiversity hotspots** | **Major tropical wilderness areas**






verse areas that face less severe threats than the hotspots, but where population density is relatively low now but is increasing rapidly. The annual growth rate of this population is 3.1 percent, more than twice that of the world. About 1.3 percent of the world's population, or 75 million people, lives in these tropical rainforests. Many are recent migrants drawn by government settlement policies, urban poverty, rural landlessness, and natural growth of populations inside and outside these ecologically sensitive regions. Logging by national and multinational companies contributes powerfully to the loss of forests in these areas, in part by opening up remote areas that landless farmers then convert to agriculture. If present deforestation rates continue, the major tropical wilderness areas could be reduced to a few isolated outposts of natural tropical woodland in the coming decades, like the hemmed-in forest parks of such cities as Rio de Janeiro and Singapore. The loss of species would have no parallel in the last 65 million years of earth history and would leave humanity poorer for as long as our own species survives.

Slowing the rate of local and global biodiversity loss presents one of the most formidable environmental challenges for humanity in the 21st century. The ongoing slowdown in population growth is one trend that offers hope that we may yet save most of the plant and animal species with which we share the earth. ▮▮

**▲ Population Density and the Biodiversity Hotspots and Tropical Wilderness Areas, 1995**

**The map depicts the estimated distribution of human population (1995 data) and the locations of the biodiversity hotspots (1-25) and major tropical wilderness areas (A, B & C). The boundaries of these biologically rich regions were mapped by ecologists Norman Myers, Russell Mittermeier, Cristina Mittermeier, Gustavo da Fonseca and Jennifer Kent. The hotspots are the most threatened of the species-rich terrestrial areas of the world. The major tropical wilderness areas are, by contrast, the least disturbed among species-rich terrestrial regions. They encompass the last remaining extensive tracts of intact tropical forest.**

**Biodiversity hotspots** **Major tropical wilderness areas**

# APPENDICES

| Country | POPULATION 1975 (thousands) | 1996[5] (thousands) | 2000 (thousands) | 2025 low projection (thousands) | 2025 medium projection (thousands) | 2025 high projection (thousands) | WATER Annual internal renewable water resources (cubic kilometers) | Renewable water per capita 1975 (cubic meters) | Renewable water per capita 2000 (cubic meters) | Renewable water per capita 2025 (low population projection) (cubic meters) | Renewable water per capita 2025 (medium population projection) (cubic meters) | Renewable water per capita 2025 (high population projection) (cubic meters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Afghanistan | 15,378 | 20,368 | 22,720 | 41,464 | 44,934 | 47,960 | 65 | 4,227 | 2,861 | 1,568 | 1,447 | 1,355 |
| Albania | 2,424 | 3,151 | 3,113 | 3,488 | 3,820 | 4,173 | 56 | 23,020 | 17,922 | 15,998 | 14,608 | 13,371 |
| Algeria | 16,018 | 28,719 | 31,471 | 42,893 | 46,611 | 49,888 | 14 | 893 | 454 | 333 | 307 | 287 |
| Angola | 6,123 | 11,342 | 12,878 | 23,708 | 25,107 | 26,784 | 184 | 30,051 | 14,288 | 7,761 | 7,329 | 6,870 |
| Argentina | 26,049 | 35,219 | 37,032 | 43,284 | 47,160 | 51,023 | 994 | 38,158 | 26,842 | 43,284 | 21,077 | 19,482 |
| Armenia | 2,826 | 3,564 | 3,520 | 3,720 | 3,946 | 4,218 | 11 | 3,715 | 2,983 | 2,822 | 2,661 | 2,489 |
| Australia[1] | 13,900 | 18,141 | 18,886 | 21,209 | 23,098 | 25,081 | 343 | 24,675 | 18,162 | 16,172 | 14,850 | 13,676 |
| Austria | 7,579 | 8,053 | 8,211 | 7,854 | 8,186 | 8,521 | 90 | 11,915 | 10,998 | 11,497 | 11,031 | 10,597 |
| Azerbaijan | 5,689 | 7,609 | 7,734 | 8,676 | 9,403 | 10,200 | 30 | 5,326 | 3,918 | 3,492 | 3,223 | 2,971 |
| Bahrain | 272 | 570 | 617 | 789 | 858 | 926 | - | - | - | - | - | - |
| Bangladesh | 76,582 | 120,594 | 129,155 | 163,172 | 178,751 | 194,737 | 1,211 | 15,808 | 9,373 | 7,419 | 6,773 | 6,217 |
| Belarus | 9,367 | 10,379 | 10,236 | 9,027 | 9,496 | 9,886 | 58 | 6,192 | 5,666 | 6,425 | 6,108 | 5,867 |
| Belgium[6] | 9,796 | 10,109 | 10,161 | 9,573 | 9,918 | 10,305 | 13 | 1,276 | 1,230 | 1,306 | 1,260 | 1,213 |
| Belize | 134 | 219 | 241 | 335 | 370 | 402 | 16 | 119,644 | 66,470 | 47,692 | 43,239 | 39,813 |
| Benin | 3,046 | 5,480 | 6,097 | 10,450 | 11,109 | 11,652 | 26 | 8,470 | 4,232 | 2,469 | 2,322 | 2,214 |
| Bhutan | 1,178 | 1,893 | 2,124 | 3,633 | 3,904 | 4,190 | 95 | 80,668 | 44,728 | 26,147 | 24,335 | 22,671 |
| Bolivia | 4,759 | 7,593 | 8,329 | 11,998 | 13,131 | 14,002 | 300 | 63,040 | 36,020 | 25,003 | 22,846 | 21,426 |
| Bosnia and Herzegovina | 3,747 | 3,422 | 3,972 | 4,039 | 4,324 | 4,657 | - | - | - | - | - | - |
| Botswana | 759 | 1,509 | 1,622 | 2,050 | 2,242 | 2,457 | 15 | 19,368 | 9,062 | 7,170 | 6,557 | 5,984 |
| Brazil | 108,167 | 161,533 | 170,115 | 198,352 | 217,930 | 238,550 | 6,950 | 64,252 | 40,855 | 35,039 | 31,891 | 29,134 |
| Brunei Darussalam | 161 | 301 | 328 | 422 | 459 | 496 | 9 | 52,861 | 25,908 | 20,142 | 18,520 | 17,143 |
| Bulgaria | 8,722 | 8,448 | 8,225 | 6,813 | 7,023 | 7,823 | 205 | 23,504 | 24,924 | 30,088 | 29,190 | 26,203 |
| Burkina Faso | 6,108 | 10,704 | 11,937 | 22,432 | 23,321 | 24,365 | 18 | 2,865 | 1,466 | 780 | 750 | 718 |
| Burundi | 3,680 | 6,265 | 6,695 | 10,952 | 11,569 | 12,387 | 4 | 978 | 538 | 329 | 311 | 291 |
| Cambodia | 7,098 | 10,234 | 11,168 | 15,126 | 16,526 | 17,671 | 476 | 67,077 | 42,632 | 31,476 | 28,808 | 26,942 |
| Cameroon | 7,527 | 13,549 | 15,085 | 24,100 | 26,484 | 27,835 | 268 | 35,605 | 17,766 | 11,120 | 10,119 | 9,628 |
| Canada | 23,209 | 29,947 | 31,147 | 35,311 | 37,896 | 41,204 | 2,901 | 124,995 | 93,140 | 82,156 | 76,551 | 70,405 |
| Cape Verde | 278 | 389 | 428 | 622 | 671 | 718 | - | - | - | - | - | - |
| Central African Republic | 2,057 | 3,354 | 3,615 | 5,316 | 5,704 | 6,036 | 141 | 68,546 | 39,001 | 26,525 | 24,720 | 23,358 |
| Chad | 4,030 | 6,899 | 7,651 | 13,123 | 13,908 | 15,052 | 43 | 10,670 | 5,620 | 3,277 | 3,092 | 2,857 |
| Chile | 10,337 | 14,421 | 15,211 | 18,025 | 19,548 | 20,864 | 468 | 45,276 | 30,767 | 25,964 | 23,941 | 22,431 |
| China[2] | 927,808 | 1,232,456 | 1,277,558 | 1,394,280 | 1,480,412 | 1,545,015 | 2,830 | 3,050 | 2,215 | 2,029 | 1,911 | 1,831 |
| Colombia | 25,381 | 39,288 | 42,321 | 55,947 | 59,758 | 64,446 | 1,070 | 42,158 | 25,283 | 19,125 | 17,906 | 16,603 |
| Congo, Dem. Republic of the | 23,251 | 46,772 | 51,654 | 98,990 | 104,788 | 112,840 | 832 | 574,966 | 282,660 | 154,355 | 146,244 | 137,185 |
| Congo, Republic | 1,447 | 2,634 | 2,943 | 5,390 | 5,689 | 6,065 | 1,019 | 43,826 | 19,727 | 10,294 | 9,724 | 9,030 |
| Costa Rica | 1,968 | 3,652 | 4,023 | 5,526 | 5,929 | 6,319 | 95 | 48,268 | 23,612 | 17,192 | 16,024 | 15,033 |
| Cote d'Ivoire | 6,755 | 13,816 | 14,786 | 21,638 | 23,345 | 25,065 | 78 | 11,503 | 5,255 | 3,591 | 3,328 | 3,100 |
| Croatia | 4,263 | 4,488 | 4,473 | 3,981 | 4,193 | 4,378 | 61 | 14,402 | 13,728 | 15,422 | 14,642 | 14,024 |
| Cuba | 9,306 | 11,018 | 11,201 | 11,402 | 11,798 | 12,559 | 35 | 3,707 | 3,080 | 3,026 | 2,924 | 2,747 |
| Czech Republic | 9,997 | 10,316 | 10,244 | 9,332 | 9,512 | 10,525 | 58 | 5,822 | 5,682 | 6,237 | 6,119 | 5,530 |
| Denmark[3] | 5,060 | 5,241 | 5,293 | 4,950 | 5,238 | 5,461 | 13 | 2,569 | 2,456 | 2,626 | 2,482 | 2,380 |

*See page 28 for endnotes.*

| ARABLE LAND | | | | | | | FOREST | | | | CARBON DIOXIDE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arable land 1975 *(thousands of hectares)* | Arable land per capita 1975 *(hectares)* | Arable land 1997 *(thousands of hectares)* | Arable land per capita 2000 *(hectares)* | Arable land per capita 2025 (low population projection) *(hectares)* | Arable land per capita 2025 (medium population projection) *(hectares)* | Arable land per capita 2025 (high population projection) *(hectares)* | Forest cover 2000 *(thousands of hectares)* | Forest cover per capita 2000 *(hectares)* | Forest cover 2025 *(thousands of hectares)* | Forest cover per capita 2025 *(hectares)* | $CO_2$ emissions 1996 *(thousands of metric tons of carbon)* | $CO_2$ emissions per capita 1996 *(metric tons of carbon)* | Country |
| 8,048 | 0.52 | 8,054 | 0.35 | 0.19 | 0.18 | 0.17 | 982 | 0.04 | 168 | 0.00 | 321 | 0.02 | Afghanistan |
| 662 | 0.27 | 702 | 0.23 | 0.20 | 0.18 | 0.17 | 1,046 | 0.34 | 1,046 | 0.27 | 530 | 0.17 | Albania |
| 7,495 | 0.47 | 8,040 | 0.26 | 0.19 | 0.17 | 0.16 | 1,751 | 0.06 | 1,291 | 0.03 | 25,736 | 0.90 | Algeria |
| 3,400 | 0.56 | 3,500 | 0.27 | 0.15 | 0.14 | 0.13 | 21,075 | 1.64 | 16,250 | 0.65 | 1,394 | 0.12 | Angola |
| 26,850 | 1.03 | 27,200 | 0.73 | 0.63 | 0.58 | 0.53 | 33,501 | 0.90 | 31,379 | 0.67 | 35,440 | 1.01 | Argentina |
| - | - | 559 | 0.16 | 0.15 | 0.14 | 0.13 | 382 | 0.11 | 748 | 0.19 | 1,009 | 0.28 | Armenia |
| 42,387 | 3.05 | 53,100 | 2.81 | 2.50 | 2.30 | 2.12 | 40,993 | 2.17 | 41,422 | 1.79 | 83,688 | 4.61 | Australia[1] |
| 1,609 | 0.21 | 1,479 | 0.18 | 0.19 | 0.18 | 0.17 | 3,877 | 0.47 | 3,877 | 0.47 | 16,185 | 2.01 | Austria |
| - | - | 1,935 | 0.25 | 0.22 | 0.21 | 0.19 | 990 | 0.13 | 990 | 0.11 | 8,193 | 1.08 | Azerbaijan |
| 4 | 0.01 | 5 | 0.01 | 0.01 | 0.01 | 0.01 | - | - | - | - | 2,887 | 5.06 | Bahrain |
| 9,129 | 0.12 | 8,241 | 0.06 | 0.05 | 0.05 | 0.04 | 968 | 0.01 | 782 | 0.00 | 6,266 | 0.05 | Bangladesh |
| - | - | 6,319 | 0.62 | 0.70 | 0.67 | 0.64 | 7,733 | 0.76 | 9,820 | 1.03 | 16,851 | 1.62 | Belarus |
| 999 | 0.10 | 785 | 0.07 | 0.08 | 0.08 | 0.07 | 709 | 0.07 | 709 | 0.07 | 28,939 | 2.86 | Belgium[6] |
| 48 | 0.36 | 89 | 0.37 | 0.27 | 0.24 | 0.22 | 1,930 | 8.02 | 1,775 | 4.80 | 97 | 0.44 | Belize |
| 1,415 | 0.46 | 1,595 | 0.26 | 0.15 | 0.14 | 0.14 | 4,345 | 0.71 | 3,180 | 0.29 | 179 | 0.03 | Benin |
| 112 | 0.10 | 160 | 0.08 | 0.04 | 0.04 | 0.04 | 2,710 | 1.28 | 2,490 | 0.64 | 71 | 0.04 | Bhutan |
| 1,880 | 0.40 | 2,100 | 0.25 | 0.18 | 0.16 | 0.15 | 45,568 | 5.47 | 34,023 | 2.59 | 2,757 | 0.36 | Bolivia |
| - | - | 650 | 0.16 | 0.16 | 0.15 | 0.14 | 2,710 | 0.68 | 2,710 | 0.63 | 849 | 0.25 | Bosnia and Herzegovina |
| 402 | 0.53 | 346 | 0.21 | 0.17 | 0.15 | 0.14 | 13,572 | 8.37 | 11,970 | 5.34 | 561 | 0.37 | Botswana |
| 40,001 | 0.37 | 65,300 | 0.38 | 0.33 | 0.30 | 0.27 | 538,656 | 3.17 | 480,358 | 2.20 | 74,610 | 0.46 | Brazil |
| 12 | 0.07 | 7 | 0.02 | 0.02 | 0.02 | 0.01 | - | - | - | - | 1,384 | 4.59 | Brunei Darussalam |
| 4,343 | 0.50 | 4,511 | 0.55 | 0.66 | 0.64 | 0.58 | 3,243 | 0.39 | 3,258 | 0.46 | 15,085 | 1.79 | Bulgaria |
| 2,536 | 0.42 | 3,440 | 0.29 | 0.15 | 0.15 | 0.14 | 4,117 | 0.34 | 3,425 | 0.15 | 264 | 0.02 | Burkina Faso |
| 1,180 | 0.32 | 1,100 | 0.16 | 0.10 | 0.10 | 0.09 | 310 | 0.05 | 278 | 0.02 | 60 | 0.01 | Burundi |
| 1,920 | 0.27 | 3,807 | 0.34 | 0.25 | 0.23 | 0.22 | 9,074 | 0.81 | 6,082 | 0.37 | 136 | 0.01 | Cambodia |
| 6,395 | 0.85 | 7,160 | 0.47 | 0.30 | 0.27 | 0.26 | 18,973 | 1.26 | 16,133 | 0.61 | 960 | 0.07 | Cameroon |
| 44,100 | 1.90 | 45,700 | 1.47 | 1.29 | 1.21 | 1.11 | 245,447 | 7.88 | 249,875 | 6.59 | 111,723 | 3.73 | Canada |
| 40 | 0.14 | 41 | 0.10 | 0.07 | 0.06 | 0.06 | - | - | - | - | 33 | 0.08 | Cape Verde |
| 1,890 | 0.92 | 2,020 | 0.56 | 0.38 | 0.35 | 0.33 | 29,302 | 8.11 | 26,357 | 4.62 | 64 | 0.02 | Central African Republic |
| 3,000 | 0.74 | 3,256 | 0.43 | 0.25 | 0.23 | 0.22 | 10,573 | 1.38 | 8,578 | 0.62 | 27 | 0.00 | Chad |
| 4,350 | 0.42 | 2,297 | 0.15 | 0.13 | 0.12 | 0.11 | 7,749 | 0.51 | 7,070 | 0.36 | 13,313 | 0.92 | Chile |
| 100,627 | 0.11 | 135,365 | 0.11 | 0.10 | 0.09 | 0.09 | 132,891 | 0.10 | 130,754 | 0.09 | 917,997 | 0.74 | China[2] |
| 5,118 | 0.20 | 4,430 | 0.10 | 0.08 | 0.07 | 0.07 | 51,709 | 1.22 | 45,761 | 0.77 | 17,824 | 0.45 | Colombia |
| 7,450 | 0.32 | 7,880 | 0.15 | 0.08 | 0.08 | 0.07 | 105,665 | 2.05 | 89,451 | 0.85 | 626 | 0.01 | Congo, Dem. Republic of the |
| 162 | 0.11 | 185 | 0.06 | 0.03 | 0.03 | 0.03 | 19,331 | 6.57 | 18,334 | 3.22 | 1,354 | 0.51 | Congo, Republic |
| 492 | 0.25 | 505 | 0.13 | 0.09 | 0.09 | 0.08 | 1,070 | 0.27 | 497 | 0.08 | 1,278 | 0.35 | Costa Rica |
| 3,715 | 0.55 | 7,350 | 0.50 | 0.34 | 0.31 | 0.29 | 5,319 | 0.36 | 4,630 | 0.20 | 3,566 | 0.26 | Cote d'Ivoire |
| - | - | 1,442 | 0.32 | 0.36 | 0.34 | 0.33 | 1,825 | 0.41 | 1,825 | 0.44 | 4,788 | 1.07 | Croatia |
| 3,170 | 0.34 | 4,450 | 0.40 | 0.39 | 0.38 | 0.35 | 1,731 | 0.15 | 1,269 | 0.11 | 8,507 | 0.77 | Cuba |
| - | - | 3,331 | 0.33 | 0.36 | 0.35 | 0.32 | 2,631 | 0.26 | 2,636 | 0.28 | 34,580 | 3.35 | Czech Republic |
| 2,660 | 0.53 | 2,373 | 0.45 | 0.48 | 0.45 | 0.43 | 417 | 0.08 | 417 | 0.08 | 15,437 | 2.95 | Denmark[3] |

| Country | POPULATION 1975 (thousands) | 1996[5] (thousands) | 2000 (thousands) | 2025 low projection (thousands) | 2025 medium projection (thousands) | 2025 high projection (thousands) | WATER Annual internal renewable water resources (cubic kilometers) | Renewable water per capita 1975 (cubic meters) | Renewable water per capita 2000 (cubic meters) | Renewable water per capita 2025 (low population projection) (cubic meters) | Renewable water per capita 2025 (medium population projection) (cubic meters) | Renewable water per capita 2025 (high population projection) (cubic meters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dominican Republic** | 5,048 | 7,961 | 8,495 | 10,383 | 11,164 | 12,127 | 20 | 3,962 | 2,354 | 1,926 | 1,791 | 1,649 |
| **Ecuador** | 6,907 | 11,699 | 12,646 | 16,490 | 17,796 | 19,341 | 314 | 45,460 | 24,830 | 19,042 | 17,644 | 16,235 |
| **Egypt** | 38,841 | 63,497 | 68,470 | 87,043 | 95,615 | 104,242 | 58 | 1,501 | 851 | 670 | 610 | 559 |
| **El Salvador** | 4,120 | 5,789 | 6,276 | 8,393 | 9,062 | 9,826 | 19 | 4,600 | 3,019 | 2,258 | 2,091 | 1,929 |
| **Equatorial Guinea** | 225 | 410 | 453 | 749 | 795 | 845 | 30 | 133,297 | 66,275 | 40,072 | 37,749 | 35,520 |
| **Eritrea** | 2,089 | - | 3,850 | 6,299 | 6,681 | 7,003 | 9 | 4,213 | 2,285 | 1,397 | 1,317 | 1,257 |
| **Estonia** | 1,432 | 1,466 | 1,396 | 1,112 | 1,131 | 1,230 | 13 | 8,939 | 9,168 | 11,512 | 11,315 | 10,405 |
| **Ethiopia** | 32,221 | 56,789 | 62,565 | 108,310 | 115,382 | 120,254 | 110 | 3,414 | 1,758 | 1,016 | 953 | 915 |
| **Fiji** | 576 | 777 | 817 | 1,012 | 1,104 | 1,195 | 29 | 49,566 | 34,949 | 28,219 | 25,857 | 23,882 |
| **Finland** | 4,711 | 5,126 | 5,176 | 5,057 | 5,254 | 5,473 | 113 | 23,984 | 21,833 | 22,346 | 21,508 | 20,647 |
| **France** | 52,699 | 58,283 | 59,080 | 58,647 | 61,662 | 63,909 | 198 | 3,757 | 3,351 | 3,376 | 3,211 | 3,098 |
| **Gabon** | 593 | 1,107 | 1,226 | 1,858 | 1,981 | 2,108 | 164 | 276,354 | 133,754 | 88,285 | 82,777 | 77,817 |
| **Gambia** | 548 | 1,150 | 1,305 | 2,044 | 2,151 | 2,260 | 8 | 14,609 | 6,129 | 3,915 | 3,719 | 3,541 |
| **Georgia** | 4,908 | 5,187 | 4,968 | 4,887 | 5,178 | 5,464 | 63 | 12,897 | 12,743 | 12,952 | 12,225 | 11,585 |
| **Germany** | 78,679 | 81,909 | 82,220 | 77,193 | 80,238 | 83,955 | 171 | 2,173 | 2,080 | 2,215 | 2,131 | 2,037 |
| **Ghana** | 9,829 | 18,154 | 20,212 | 34,245 | 36,876 | 39,682 | 53 | 5,412 | 2,632 | 1,553 | 1,443 | 1,341 |
| **Greece** | 9,047 | 10,532 | 10,645 | 9,713 | 9,863 | 10,354 | 59 | 6,483 | 5,510 | 6,038 | 5,947 | 5,664 |
| **Grenada** | 92 | 92 | 94 | 102 | 105 | 108 | - | - | - | - | - | - |
| **Guatemala** | 6,018 | 10,244 | 11,385 | 18,392 | 19,816 | 21,278 | 116 | 19,276 | 10,189 | 6,307 | 5,854 | 5,452 |
| **Guinea** | 4,149 | 7,275 | 7,430 | 12,020 | 12,497 | 12,982 | 226 | 54,476 | 30,416 | 18,803 | 18,084 | 17,409 |
| **Guinea-Bissau** | 627 | 1,111 | 1,213 | 1,822 | 1,946 | 2,079 | 27 | 43,041 | 22,257 | 14,817 | 13,874 | 12,987 |
| **Guyana** | 734 | 837 | 861 | 932 | 1,045 | 1,165 | 241 | 328,391 | 279,799 | 258,642 | 230,695 | 206,852 |
| **Haiti** | 4,920 | 7,689 | 8,222 | 11,177 | 11,988 | 12,805 | 11 | 2,236 | 1,338 | 984 | 918 | 859 |
| **Honduras** | 3,017 | 5,816 | 6,485 | 9,843 | 10,656 | 11,809 | 63 | 21,022 | 9,778 | 6,443 | 5,951 | 5,370 |
| **Hungary** | 10,532 | 10,193 | 10,036 | 8,581 | 8,900 | 9,800 | 120 | 11,394 | 11,957 | 13,984 | 13,483 | 12,245 |
| **Iceland** | 218 | 271 | 281 | 311 | 328 | 346 | 168 | 770,533 | 597,931 | 540,290 | 511,640 | 485,399 |
| **India** | 620,701 | 949,997 | 1,013,662 | 1,215,672 | 1,330,449 | 1,446,848 | 1,908 | 3,074 | 1,882 | 1,569 | 1,434 | 1,319 |
| **Indonesia** | 135,666 | 200,415 | 212,107 | 246,964 | 273,442 | 299,848 | 2,838 | 20,919 | 13,380 | 11,492 | 10,379 | 9,465 |
| **Iran, Islamic Republic of** | 33,344 | 63,469 | 67,702 | 85,613 | 94,463 | 103,564 | 138 | 4,124 | 2,031 | 1,606 | 1,456 | 1,328 |
| **Iraq** | 11,020 | 20,608 | 23,115 | 38,588 | 41,014 | 43,483 | 75 | 6,844 | 3,263 | 1,954 | 1,839 | 1,734 |
| **Ireland** | 3,177 | 3,634 | 3,730 | 4,175 | 4,404 | 4,630 | 50 | 15,737 | 13,404 | 11,976 | 11,354 | 10,799 |
| **Israel** | 3,455 | 5,722 | 6,217 | 7,345 | 8,277 | 9,312 | 2 | 622 | 346 | 293 | 260 | 231 |
| **Italy** | 55,441 | 57,392 | 57,298 | 49,841 | 51,270 | 53,306 | 167 | 3,012 | 2,915 | 3,351 | 3,257 | 3,133 |
| **Jamaica** | 2,013 | 2,495 | 2,583 | 2,948 | 3,245 | 3,530 | 8 | 4,124 | 3,214 | 2,815 | 2,558 | 2,351 |
| **Japan** | 111,524 | 125,769 | 126,714 | 116,290 | 121,150 | 124,832 | 430 | 3,856 | 3,393 | 3,698 | 3,549 | 3,445 |
| **Jordan** | 2,600 | 5,938 | 6,669 | 11,068 | 12,063 | 12,982 | 1 | 338 | 132 | 80 | 73 | 68 |
| **Kazakhstan** | 14,136 | 16,436 | 16,223 | 15,786 | 17,698 | 19,714 | 110 | 7,753 | 6,756 | 6,943 | 6,193 | 5,560 |
| **Kenya** | 13,741 | 27,851 | 30,080 | 38,041 | 41,756 | 45,468 | 30 | 2,198 | 1,004 | 794 | 723 | 664 |
| **Korea, Dem. People's Rep. of** | 16,304 | 22,610 | 24,039 | 27,813 | 29,388 | 31,297 | 77 | 4,729 | 3,207 | 2,772 | 2,624 | 2,463 |
| **Korea, Republic of** | 35,281 | 45,345 | 46,844 | 49,704 | 52,533 | 54,620 | 70 | 1,976 | 1,488 | 1,402 | 1,327 | 1,276 |
| **Kuwait** | 1,007 | 1,686 | 1,972 | 2,721 | 2,974 | 3,221 | 0 | 20 | 10 | 7 | 7 | 6 |
| **Kyrgyzstan** | 3,299 | 4,596 | 4,699 | 5,583 | 6,096 | 6,622 | 21 | 6,244 | 4,384 | 3,690 | 3,379 | 3,111 |
| **Lao People's Dem. Republic** | 3,024 | 4,902 | 5,433 | 9,235 | 9,653 | 10,515 | 332 | 109,645 | 61,034 | 35,908 | 34,354 | 31,536 |

| ARABLE LAND | | | | | | | FOREST | | | | CARBON DIOXIDE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arable land 1975 (thousands of hectares) | Arable land per capita 1975 (hectares) | Arable land 1997 (thousands of hectares) | Arable land per capita 2000 (hectares) | Arable land per capita 2025 (low population projection) (hectares) | Arable land per capita 2025 (medium population projection) (hectares) | Arable land per capita 2025 (high population projection) (hectares) | Forest cover 2000 (thousands of hectares) | Forest cover per capita 2000 (hectares) | Forest cover 2025 (thousands of hectares) | Forest cover per capita 2025 (hectares) | $CO_2$ emissions 1996 (thousands of metric tons of carbon) | $CO_2$ emissions per capita 1996 (metric tons of carbon) | Country |
| 1,255 | 0.25 | 1,500 | 0.18 | 0.14 | 0.13 | 0.12 | 1,460 | 0.17 | 978 | 0.09 | 3,518 | 0.44 | **Dominican Republic** |
| 2,585 | 0.37 | 3,001 | 0.24 | 0.18 | 0.17 | 0.16 | 10,266 | 0.81 | 6,832 | 0.38 | 6,683 | 0.57 | **Ecuador** |
| 2,825 | 0.07 | 3,300 | 0.05 | 0.04 | 0.03 | 0.03 | 34 | 0.00 | 34 | 0.00 | 26,712 | 0.42 | **Egypt** |
| 698 | 0.17 | 816 | 0.13 | 0.10 | 0.09 | 0.08 | 89 | 0.01 | 39 | 0.00 | 1,104 | 0.19 | **El Salvador** |
| 230 | 1.02 | 230 | 0.51 | 0.31 | 0.29 | 0.27 | 1,734 | 3.83 | 1,518 | 1.91 | 39 | 0.10 | **Equatorial Guinea** |
| - | - | 393 | 0.10 | 0.06 | 0.06 | 0.06 | 282 | 0.07 | 282 | 0.04 | - | - | **Eritrea** |
| - | - | 1,143 | 0.82 | 1.03 | 1.01 | 0.93 | 2,114 | 1.51 | 2,714 | 2.40 | 4,473 | 3.05 | **Estonia** |
| - | - | 10,500 | 0.17 | 0.10 | 0.09 | 0.09 | 13,274 | 0.21 | 11,849 | 0.10 | 919 | 0.02 | **Ethiopia** |
| 155 | 0.27 | 285 | 0.35 | 0.28 | 0.26 | 0.24 | 817 | 1.00 | 735 | 0.67 | 208 | 0.27 | **Fiji** |
| 2,453 | 0.52 | 2,129 | 0.41 | 0.42 | 0.41 | 0.39 | 19,946 | 3.85 | 19,538 | 3.72 | 16,150 | 3.15 | **Finland** |
| 18,954 | 0.36 | 19,468 | 0.33 | 0.33 | 0.32 | 0.30 | 15,883 | 0.27 | 20,907 | 0.34 | 98,750 | 1.69 | **France** |
| 369 | 0.62 | 495 | 0.40 | 0.27 | 0.25 | 0.23 | 17,415 | 14.20 | 15,357 | 7.75 | 1,007 | 0.91 | **Gabon** |
| 164 | 0.30 | 200 | 0.15 | 0.10 | 0.09 | 0.09 | 87 | 0.07 | 70 | 0.03 | 59 | 0.05 | **Gambia** |
| - | - | 1,066 | 0.21 | 0.22 | 0.21 | 0.20 | 2,988 | 0.60 | 2,988 | 0.58 | 810 | 0.16 | **Georgia** |
| 12,510 | 0.16 | 12,060 | 0.15 | 0.16 | 0.15 | 0.14 | 10,740 | 0.13 | 10,740 | 0.13 | 235,050 | 2.87 | **Germany** |
| 3,400 | 0.35 | 4,550 | 0.23 | 0.13 | 0.12 | 0.11 | 8,472 | 0.42 | 6,185 | 0.17 | 1,104 | 0.06 | **Ghana** |
| 3,867 | 0.43 | 3,915 | 0.37 | 0.40 | 0.40 | 0.38 | 7,302 | 0.69 | 12,938 | 1.31 | 22,002 | 2.09 | **Greece** |
| 18 | 0.20 | 11 | 0.12 | 0.11 | 0.11 | 0.10 | - | - | - | - | 44 | 0.48 | **Grenada** |
| 1,638 | 0.27 | 1,905 | 0.17 | 0.10 | 0.10 | 0.09 | 3,469 | 0.30 | 2,084 | 0.11 | 1,849 | 0.18 | **Guatemala** |
| 1,115 | 0.27 | 1,485 | 0.20 | 0.12 | 0.12 | 0.11 | 6,014 | 0.81 | 4,521 | 0.36 | 298 | 0.04 | **Guinea** |
| 285 | 0.45 | 350 | 0.29 | 0.19 | 0.18 | 0.17 | 2,258 | 1.86 | 2,020 | 1.04 | 63 | 0.06 | **Guinea-Bissau** |
| 379 | 0.52 | 496 | 0.58 | 0.53 | 0.47 | 0.43 | 18,534 | 21.52 | 18,321 | 17.54 | 260 | 0.31 | **Guyana** |
| 860 | 0.17 | 910 | 0.11 | 0.08 | 0.08 | 0.07 | 18 | 0.00 | 7 | 0.00 | 292 | 0.04 | **Haiti** |
| 1,635 | 0.54 | 2,045 | 0.32 | 0.21 | 0.19 | 0.17 | 3,660 | 0.56 | 2,039 | 0.19 | 1,099 | 0.19 | **Honduras** |
| 5,495 | 0.52 | 5,047 | 0.50 | 0.59 | 0.57 | 0.52 | 1,764 | 0.18 | 2,008 | 0.23 | 16,231 | 1.59 | **Hungary** |
| 8 | 0.04 | 6 | 0.02 | 0.02 | 0.02 | 0.02 | 11 | 0.04 | 11 | 0.03 | 599 | 2.21 | **Iceland** |
| 168,010 | 0.27 | 169,850 | 0.17 | 0.14 | 0.13 | 0.12 | 65,041 | 0.06 | 65,221 | 0.05 | 272,212 | 0.29 | **India** |
| 26,000 | 0.19 | 30,987 | 0.15 | 0.13 | 0.11 | 0.10 | 104,624 | 0.49 | 82,216 | 0.30 | 66,882 | 0.33 | **Indonesia** |
| 16,440 | 0.49 | 19,400 | 0.29 | 0.23 | 0.21 | 0.19 | 1,414 | 0.02 | 911 | 0.01 | 72,779 | 1.15 | **Iran, Islamic Republic of** |
| 5,285 | 0.48 | 5,540 | 0.24 | 0.14 | 0.14 | 0.13 | 83 | 0.00 | 83 | 0.00 | 24,942 | 1.21 | **Iraq** |
| 1,236 | 0.39 | 1,346 | 0.36 | 0.32 | 0.31 | 0.29 | 650 | 0.17 | 1,251 | 0.28 | 9,527 | 2.62 | **Ireland** |
| 422 | 0.12 | 437 | 0.07 | 0.06 | 0.05 | 0.05 | 102 | 0.02 | 102 | 0.01 | 14,282 | 2.50 | **Israel** |
| 12,313 | 0.22 | 10,927 | 0.19 | 0.22 | 0.21 | 0.20 | 6,525 | 0.11 | 6,673 | 0.13 | 110,052 | 1.92 | **Italy** |
| 250 | 0.12 | 274 | 0.11 | 0.09 | 0.08 | 0.08 | 121 | 0.05 | 19 | 0.01 | 2,743 | 1.10 | **Jamaica** |
| 5,088 | 0.05 | 4,295 | 0.03 | 0.04 | 0.04 | 0.03 | 25,080 | 0.20 | 24,754 | 0.20 | 318,686 | 2.53 | **Japan** |
| 325 | 0.13 | 390 | 0.06 | 0.04 | 0.03 | 0.03 | 40 | 0.01 | 21 | 0.00 | 3,748 | 0.63 | **Jordan** |
| - | - | 30,135 | 1.86 | 1.91 | 1.70 | 1.53 | 11,565 | 0.71 | 18,715 | 1.06 | 47,447 | 2.89 | **Kazakhstan** |
| 4,272 | 0.31 | 4,520 | 0.15 | 0.12 | 0.11 | 0.10 | 1,275 | 0.04 | 1,195 | 0.03 | 1,849 | 0.07 | **Kenya** |
| 1,845 | 0.11 | 2,000 | 0.08 | 0.07 | 0.07 | 0.06 | 6,170 | 0.26 | 6,170 | 0.21 | 69,412 | 3.07 | **Korea, Dem. People's Rep. of** |
| 2,240 | 0.06 | 1,924 | 0.04 | 0.04 | 0.04 | 0.04 | 7,562 | 0.16 | 7,247 | 0.14 | 111,370 | 2.46 | **Korea, Republic of** |
| 1 | 0.00 | 7 | 0.00 | 0.00 | 0.00 | 0.00 | 5 | 0.00 | 5 | 0.00 | 11,624 | 6.89 | **Kuwait** |
| - | - | 1,425 | 0.30 | 0.26 | 0.23 | 0.22 | 730 | 0.16 | 730 | 0.12 | 1,674 | 0.36 | **Kyrgyzstan** |
| 670 | 0.22 | 852 | 0.16 | 0.09 | 0.09 | 0.08 | 11,735 | 2.16 | 8,783 | 0.91 | 92 | 0.02 | **Lao People's Dem. Republic** |

| | POPULATION | | | | | | WATER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | 1975 (thousands) | 1996[5] (thousands) | 2000 (thousands) | 2025 low projection (thousands) | 2025 medium projection (thousands) | 2025 high projection (thousands) | Annual internal renewable water resources (cubic kilometers) | Renewable water per capita 1975 (cubic meters) | Renewable water per capita 2000 (cubic meters) | Renewable water per capita 2025 (low population projection) (cubic meters) | Renewable water per capita 2025 (medium population projection) (cubic meters) | Renewable water per capita 2025 (high population projection) (cubic meters) |
| **Latvia** | 2,474 | 2,499 | 2,357 | 1,870 | 1,936 | 2,087 | 35 | 14,312 | 15,022 | 18,928 | 18,285 | 16,965 |
| **Lebanon** | 2,767 | 3,083 | 3,282 | 3,986 | 4,400 | 4,814 | 5 | 1,735 | 1,463 | 1,204 | 1,091 | 997 |
| **Lesotho** | 1,187 | - | 2,153 | 3,238 | 3,506 | 3,690 | 5 | 4,405 | 2,430 | 1,615 | 1,492 | 1,417 |
| **Liberia** | 1,609 | 2,198 | 3,154 | 6,218 | 6,618 | 7,337 | 232 | 144,179 | 73,557 | 37,312 | 35,058 | 31,620 |
| **Libya** | 2,446 | 5,086 | 5,605 | 7,887 | 8,647 | 9,298 | 1 | 245 | 107 | 76 | 69 | 65 |
| **Lithuania** | 3,308 | 3,715 | 3,670 | 3,289 | 3,399 | 3,680 | 25 | 7,527 | 6,784 | 7,572 | 7,326 | 6,767 |
| **Luxembourg**[6] | 362 | 412 | 431 | 439 | 463 | 485 | - | - | - | - | - | - |
| **Macedonia** | 1,676 | - | 2,024 | 2,103 | 2,258 | 2,401 | - | - | - | - | - | - |
| **Madagascar** | 7,819 | 14,183 | 15,942 | 27,403 | 28,964 | 30,884 | 337 | 43,098 | 21,139 | 12,298 | 11,635 | 10,912 |
| **Malawi** | 5,244 | 9,835 | 10,925 | 18,204 | 19,958 | 21,446 | 19 | 3,562 | 1,710 | 1,026 | 936 | 871 |
| **Malaysia** | 12,258 | 20,549 | 22,244 | 28,404 | 30,968 | 33,531 | 580 | 47,317 | 26,074 | 20,419 | 18,729 | 17,297 |
| **Mali** | 6,169 | 10,186 | 11,234 | 19,740 | 21,295 | 23,349 | 100 | 16,211 | 8,902 | 5,066 | 4,696 | 4,283 |
| **Mauritania** | 1,371 | 1,124 | 2,670 | 4,520 | 4,766 | 5,070 | 11 | 8,314 | 4,270 | 2,522 | 2,392 | 2,248 |
| **Mauritius**[4] | 892 | 2,394 | 1,158 | 1,281 | 1,379 | 1,471 | 2 | 2,477 | 1,908 | 1,725 | 1,602 | 1,502 |
| **Mexico** | 59,099 | 92,718 | 98,881 | 120,389 | 130,196 | 141,966 | 357 | 6,047 | 3,614 | 2,969 | 2,745 | 2,518 |
| **Moldova, Republic of** | 3,839 | 4,376 | 4,380 | 4,231 | 4,547 | 4,786 | 12 | 3,048 | 2,671 | 2,765 | 2,573 | 2,445 |
| **Mongolia** | 1,447 | 2,495 | 2,662 | 3,340 | 3,709 | 4,076 | 35 | 24,043 | 13,073 | 10,420 | 9,383 | 8,538 |
| **Morocco** | 17,305 | 26,417 | 28,351 | 35,195 | 38,670 | 42,059 | 30 | 1,734 | 1,058 | 852 | 776 | 713 |
| **Mozambique** | 10,498 | 17,950 | 19,680 | 29,103 | 30,612 | 32,684 | 216 | 20,575 | 10,975 | 7,422 | 7,056 | 6,609 |
| **Myanmar** | 30,441 | 43,393 | 45,611 | 52,906 | 58,120 | 63,210 | 1,046 | 34,348 | 22,924 | 19,763 | 17,990 | 16,542 |
| **Namibia** | 900 | - | 1,726 | 2,107 | 2,338 | 2,497 | 46 | 50,538 | 26,364 | 21,595 | 19,464 | 18,220 |
| **Nepal** | 12,797 | 21,791 | 23,930 | 35,393 | 38,010 | 40,674 | 210 | 16,426 | 8,784 | 5,939 | 5,530 | 5,168 |
| **Netherlands** | 13,653 | 15,541 | 15,786 | 15,441 | 15,782 | 16,544 | 90 | 6,592 | 5,701 | 5,829 | 5,703 | 5,440 |
| **New Zealand** | 3,083 | 3,720 | 3,862 | 4,418 | 4,695 | 5,004 | 327 | 106,062 | 84,673 | 74,020 | 69,649 | 65,345 |
| **Nicaragua** | 2,498 | 4,552 | 5,074 | 8,035 | 8,696 | 9,368 | 175 | 70,053 | 34,488 | 21,780 | 20,124 | 18,680 |
| **Niger** | 4,771 | 9,454 | 10,730 | 20,797 | 21,495 | 22,184 | 33 | 6,813 | 3,029 | 1,563 | 1,512 | 1,465 |
| **Nigeria** | 57,004 | 101,413 | 111,506 | 174,368 | 183,041 | 196,872 | 280 | 4,912 | 2,511 | 1,606 | 1,530 | 1,422 |
| **Norway** | 4,007 | 4,372 | 4,465 | 4,569 | 4,817 | 5,029 | 392 | 97,821 | 87,800 | 85,794 | 81,383 | 77,945 |
| **Oman** | 880 | 2,230 | 2,542 | 5,019 | 5,352 | 5,738 | 1 | 880 | 388 | 196 | 184 | 172 |
| **Pakistan** | 74,734 | 140,055 | 156,483 | 245,920 | 263,000 | 280,225 | 418 | 5,597 | 2,673 | 1,701 | 1,590 | 1,493 |
| **Panama** | 1,723 | 2,677 | 2,856 | 3,483 | 3,779 | 4,126 | 144 | 83,567 | 50,426 | 41,340 | 38,104 | 34,904 |
| **Papua New Guinea** | 2,729 | 4,399 | 4,807 | 6,765 | 7,460 | 7,962 | 801 | 293,559 | 166,644 | 118,400 | 107,374 | 100,597 |
| **Paraguay** | 2,659 | 4,957 | 5,496 | 8,711 | 9,355 | 9,806 | 314 | 118,096 | 57,128 | 36,045 | 33,564 | 32,022 |
| **Peru** | 15,161 | 23,944 | 25,662 | 32,505 | 35,518 | 38,550 | 40 | 2,638 | 1,559 | 1,231 | 1,126 | 1,038 |
| **Philippines** | 43,010 | 69,902 | 75,967 | 100,153 | 108,251 | 117,066 | 479 | 11,137 | 6,305 | 4,783 | 4,425 | 4,092 |
| **Poland** | 34,022 | 38,659 | 38,765 | 38,143 | 39,069 | 41,321 | 56 | 1,652 | 1,450 | 1,473 | 1,438 | 1,360 |
| **Portugal** | 9,093 | 9,859 | 9,875 | 9,165 | 9,348 | 10,025 | 70 | 7,654 | 7,048 | 7,594 | 7,445 | 6,943 |
| **Qatar** | 171 | 558 | 599 | 728 | 779 | 824 | - | - | - | - | - | - |
| **Romania** | 21,245 | 22,633 | 22,327 | 19,607 | 19,945 | 22,510 | 208 | 9,790 | 9,316 | 10,608 | 10,428 | 9,240 |
| **Russia** | 134,233 | 147,876 | 146,934 | 131,063 | 137,933 | 150,380 | 4,498 | 33,511 | 30,614 | 34,321 | 32,612 | 29,912 |
| **Rwanda** | 4,384 | 5,475 | 7,733 | 11,580 | 12,427 | 13,058 | 6 | 1,437 | 815 | 544 | 507 | 482 |
| **Samoa** | 151 | 170 | 180 | 255 | 271 | 293 | - | - | - | - | - | - |
| **Saudi Arabia** | 7,251 | 18,829 | 21,607 | 37,562 | 39,965 | 42,407 | 2 | 331 | 111 | 64 | 60 | 57 |

| ARABLE LAND | | | | | | | FOREST | | | | CARBON DIOXIDE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arable land 1975 (thousands of hectares) | Arable land per capita 1975 (hectares) | Arable land 1997 (thousands of hectares) | Arable land per capita 2000 (hectares) | Arable land per capita 2025 (low population projection) (hectares) | Arable land per capita 2025 (medium population projection) (hectares) | Arable land per capita 2025 (high population projection) (hectares) | Forest cover 2000 (thousands of hectares) | Forest cover per capita 2000 (hectares) | Forest cover 2025 (thousands of hectares) | Forest cover per capita 2025 (hectares) | $CO_2$ emissions 1996 (thousands of metric tons of carbon) | $CO_2$ emissions per capita 1996 (metric tons of carbon) | Country |
| - | - | 1,830 | 0.78 | 0.98 | 0.95 | 0.88 | 3,013 | 1.28 | 3,760 | 1.94 | 2,533 | 1.01 | **Latvia** |
| 335 | 0.12 | 308 | 0.09 | 0.08 | 0.07 | 0.06 | 35 | 0.01 | 5 | 0.00 | 3,866 | 1.25 | **Lebanon** |
| 372 | 0.31 | 325 | 0.15 | 0.10 | 0.09 | 0.09 | 6 | 0.00 | 6 | 0.00 | - | - | **Lesotho** |
| 366 | 0.23 | 327 | 0.10 | 0.05 | 0.05 | 0.04 | 4,377 | 1.39 | 3,780 | 0.57 | 89 | 0.04 | **Liberia** |
| 2,055 | 0.84 | 2,115 | 0.38 | 0.27 | 0.24 | 0.23 | 400 | 0.07 | 400 | 0.05 | 11,075 | 2.18 | **Libya** |
| - | - | 3,006 | 0.82 | 0.91 | 0.88 | 0.82 | 2,034 | 0.55 | 2,348 | 0.69 | 3,780 | 1.02 | **Lithuania** |
| 999 | 0.10 | 785 | 0.07 | 0.08 | 0.08 | 0.07 | - | - | - | - | 2,260 | 5.48 | **Luxembourg**[6] |
| - | - | 658 | 0.33 | 0.31 | 0.29 | 0.27 | 987 | 0.49 | 982 | 0.43 | - | - | **Macedonia** |
| 2,759 | 0.35 | 3,108 | 0.19 | 0.11 | 0.11 | 0.10 | 14,483 | 0.91 | 11,732 | 0.41 | 327 | 0.02 | **Madagascar** |
| 1,270 | 0.24 | 1,710 | 0.16 | 0.09 | 0.09 | 0.08 | 3,087 | 0.28 | 2,084 | 0.10 | 200 | 0.02 | **Malawi** |
| 4,678 | 0.38 | 7,605 | 0.34 | 0.27 | 0.25 | 0.23 | 13,699 | 0.62 | 7,457 | 0.24 | 32,497 | 1.58 | **Malaysia** |
| 1,850 | 0.30 | 4,650 | 0.41 | 0.24 | 0.22 | 0.20 | 11,043 | 0.98 | 8,689 | 0.41 | 129 | 0.01 | **Mali** |
| 196 | 0.14 | 502 | 0.19 | 0.11 | 0.11 | 0.10 | 556 | 0.21 | 556 | 0.12 | 476 | 0.42 | **Mauritania** |
| 106 | 0.12 | 106 | 0.09 | 0.08 | 0.08 | 0.07 | 12 | 0.01 | 12 | 0.01 | 805 | 0.34 | **Mauritius**[4] |
| 23,840 | 0.40 | 27,300 | 0.28 | 0.23 | 0.21 | 0.19 | 52,958 | 0.54 | 42,322 | 0.33 | 95,007 | 1.02 | **Mexico** |
| - | - | 2,183 | 0.50 | 0.52 | 0.48 | 0.46 | 357 | 0.08 | 357 | 0.08 | 3,302 | 0.75 | **Moldova, Republic of** |
| 827 | 0.57 | 1,320 | 0.50 | 0.40 | 0.36 | 0.32 | 9,406 | 3.53 | 9,406 | 2.54 | 2,424 | 0.97 | **Mongolia** |
| 7,717 | 0.45 | 9,595 | 0.34 | 0.27 | 0.25 | 0.23 | 3,777 | 0.13 | 3,499 | 0.09 | 7,609 | 0.29 | **Morocco** |
| 3,080 | 0.29 | 3,180 | 0.16 | 0.11 | 0.10 | 0.10 | 16,300 | 0.83 | 13,761 | 0.45 | 272 | 0.02 | **Mozambique** |
| 9,985 | 0.33 | 10,151 | 0.22 | 0.19 | 0.17 | 0.16 | 25,343 | 0.56 | 17,956 | 0.31 | 1,995 | 0.05 | **Myanmar** |
| 653 | 0.73 | 820 | 0.48 | 0.39 | 0.35 | 0.33 | 12,168 | 7.05 | 11,186 | 4.79 | - | - | **Namibia** |
| 2,326 | 0.18 | 2,968 | 0.12 | 0.08 | 0.08 | 0.07 | 4,563 | 0.19 | 3,461 | 0.09 | 440 | 0.02 | **Nepal** |
| 796 | 0.06 | 935 | 0.06 | 0.06 | 0.06 | 0.06 | 334 | 0.02 | 334 | 0.02 | 42,348 | 2.72 | **Netherlands** |
| 3,500 | 1.14 | 3,280 | 0.85 | 0.74 | 0.70 | 0.66 | 8,107 | 2.10 | 9,321 | 1.99 | 8,120 | 2.18 | **New Zealand** |
| 1,230 | 0.49 | 2,746 | 0.54 | 0.34 | 0.32 | 0.29 | 4,896 | 0.96 | 2,592 | 0.30 | 781 | 0.17 | **Nicaragua** |
| 2,154 | 0.45 | 5,000 | 0.47 | 0.24 | 0.23 | 0.23 | 2,562 | 0.24 | 2,562 | 0.12 | 306 | 0.03 | **Niger** |
| 30,000 | 0.53 | 30,738 | 0.28 | 0.18 | 0.17 | 0.16 | 13,199 | 0.12 | 10,640 | 0.06 | 22,743 | 0.22 | **Nigeria** |
| 792 | 0.20 | 902 | 0.20 | 0.20 | 0.19 | 0.18 | 8,210 | 1.84 | 8,933 | 1.85 | 18,290 | 4.18 | **Norway** |
| 37 | 0.04 | 63 | 0.02 | 0.01 | 0.01 | 0.01 | - | - | - | - | 4,133 | 1.85 | **Oman** |
| 19,830 | 0.27 | 21,600 | 0.14 | 0.09 | 0.08 | 0.08 | 1,510 | 0.01 | 727 | 0.00 | 25,746 | 0.18 | **Pakistan** |
| 546 | 0.32 | 655 | 0.23 | 0.19 | 0.17 | 0.16 | 2,514 | 0.88 | 1,468 | 0.39 | 1,823 | 0.68 | **Panama** |
| 491 | 0.18 | 670 | 0.14 | 0.10 | 0.09 | 0.08 | 36,285 | 7.55 | 33,184 | 4.45 | 657 | 0.15 | **Papua New Guinea** |
| 1,154 | 0.43 | 2,285 | 0.42 | 0.26 | 0.24 | 0.23 | 10,097 | 1.84 | 5,206 | 0.56 | 1,009 | 0.20 | **Paraguay** |
| 3,200 | 0.21 | 4,200 | 0.16 | 0.13 | 0.12 | 0.11 | 66,495 | 2.59 | 61,408 | 1.73 | 7,144 | 0.30 | **Peru** |
| 7,664 | 0.18 | 9,520 | 0.13 | 0.10 | 0.09 | 0.08 | 5,667 | 0.07 | 2,336 | 0.02 | 17,260 | 0.25 | **Philippines** |
| 15,099 | 0.44 | 14,424 | 0.37 | 0.38 | 0.37 | 0.35 | 8,792 | 0.23 | 9,101 | 0.23 | 97,375 | 2.52 | **Poland** |
| 3,118 | 0.34 | 2,900 | 0.29 | 0.32 | 0.31 | 0.29 | 3,000 | 0.30 | 3,713 | 0.40 | 13,082 | 1.33 | **Portugal** |
| 2 | 0.01 | 17 | 0.03 | 0.02 | 0.02 | 0.02 | - | - | - | - | 7,948 | 14.24 | **Qatar** |
| 10,500 | 0.49 | 9,900 | 0.44 | 0.50 | 0.50 | 0.44 | 6,240 | 0.28 | 6,210 | 0.31 | 32,555 | 1.44 | **Romania** |
| - | - | 127,962 | 0.87 | 0.98 | 0.93 | 0.85 | 763,500 | 5.20 | 763,500 | 5.54 | 431,090 | 2.92 | **Russia** |
| 912 | 0.21 | 1,150 | 0.15 | 0.10 | 0.09 | 0.09 | 248 | 0.03 | 238 | 0.02 | 134 | 0.02 | **Rwanda** |
| 118 | 0.78 | 122 | 0.68 | 0.48 | 0.45 | 0.42 | - | - | - | - | 36 | 0.21 | **Samoa** |
| 1,684 | 0.23 | 3,830 | 0.18 | 0.10 | 0.10 | 0.09 | 213 | 0.01 | 175 | 0.00 | 73,098 | 3.88 | **Saudi Arabia** |

| Country | POPULATION 1975 (thousands) | 1996[5] (thousands) | 2000 (thousands) | 2025 low projection (thousands) | 2025 medium projection (thousands) | 2025 high projection (thousands) | WATER Annual internal renewable water resources (cubic kilometers) | Renewable water per capita 1975 (cubic meters) | Renewable water per capita 2000 (cubic meters) | Renewable water per capita 2025 (low population projection) (cubic meters) | Renewable water per capita 2025 (medium population projection) (cubic meters) | Renewable water per capita 2025 (high population projection) (cubic meters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Senegal** | 4,806 | 8,548 | 9,481 | 15,803 | 16,743 | 17,639 | 39 | 8,198 | 4,156 | 2,493 | 2,353 | 2,234 |
| **Sierra Leone** | 2,931 | 4,289 | 4,854 | 7,714 | 8,085 | 8,655 | 160 | 54,597 | 32,960 | 20,742 | 19,789 | 18,486 |
| **Singapore** | 2,263 | 3,375 | 3,567 | 3,939 | 4,168 | 4,304 | 1 | 265 | 168 | 152 | 144 | 139 |
| **Slovakia** | 4,736 | 5,365 | 5,387 | 5,119 | 5,393 | 5,831 | 31 | 6,503 | 5,716 | 6,016 | 5,710 | 5,281 |
| **Slovenia** | 1,742 | 1,995 | 1,986 | 1,790 | 1,818 | 1,950 | - | - | - | - | - | - |
| **Solomon Islands** | 190 | 392 | 444 | 756 | 817 | 883 | 45 | 234,897 | 100,757 | 59,092 | 54,742 | 50,617 |
| **Somalia** | 4,134 | 8,467 | 10,097 | 19,853 | 21,211 | 22,663 | 14 | 3,266 | 1,337 | 680 | 636 | 596 |
| **South Africa** | 24,728 | 38,126 | 40,377 | 41,809 | 46,015 | 50,289 | 50 | 2,022 | 1,238 | 1,196 | 1,087 | 994 |
| **Spain** | 35,596 | 39,593 | 39,630 | 35,976 | 36,658 | 38,837 | 111 | 3,127 | 2,808 | 3,094 | 3,036 | 2,866 |
| **Sri Lanka** | 13,603 | 18,096 | 18,827 | 22,341 | 23,547 | 24,933 | 50 | 3,676 | 2,656 | 2,238 | 2,123 | 2,005 |
| **Sudan** | 16,012 | 27,160 | 29,490 | 43,675 | 46,264 | 48,735 | 154 | 9,618 | 5,222 | 3,526 | 3,329 | 3,160 |
| **Suriname** | 364 | 410 | 417 | 482 | 525 | 564 | 200 | 548,698 | 479,467 | 414,836 | 381,212 | 354,855 |
| **Swaziland** | 482 | 898 | 1,008 | 1,643 | 1,785 | 1,926 | 5 | 9,364 | 4,475 | 2,745 | 2,527 | 2,342 |
| **Sweden** | 8,193 | 8,832 | 8,910 | 8,866 | 9,097 | 9,816 | 180 | 21,971 | 20,202 | 20,302 | 19,787 | 18,338 |
| **Switzerland** | 6,339 | 7,198 | 7,386 | 7,271 | 7,587 | 7,938 | 50 | 7,888 | 6,770 | 6,877 | 6,590 | 6,299 |
| **Syrian Arab Republic** | 7,438 | 14,571 | 16,125 | 24,335 | 26,292 | 28,265 | 45 | 6,014 | 2,774 | 1,838 | 1,701 | 1,583 |
| **Tajikistan** | 3,442 | 5,836 | 6,188 | 8,089 | 8,857 | 9,645 | 16 | 4,648 | 2,586 | 1,978 | 1,807 | 1,659 |
| **Tanzania, United Republic of** | 15,900 | 30,700 | 33,517 | 52,598 | 57,918 | 62,010 | 89 | 5,597 | 2,655 | 1,692 | 1,537 | 1,435 |
| **Thailand** | 41,359 | 59,172 | 61,399 | 67,999 | 72,717 | 77,953 | 410 | 9,911 | 6,676 | 6,028 | 5,637 | 5,258 |
| **Togo** | 2,285 | 4,172 | 4,629 | 7,949 | 8,482 | 9,145 | 12 | 5,251 | 2,592 | 1,510 | 1,415 | 1,312 |
| **Trinidad and Tobago** | 1,012 | 1,270 | 1,295 | 1,415 | 1,493 | 1,587 | 5 | 5,040 | 3,938 | 3,604 | 3,415 | 3,213 |
| **Tunisia** | 5,668 | 9,081 | 9,586 | 11,775 | 12,843 | 13,927 | 4 | 727 | 430 | 350 | 321 | 296 |
| **Turkey** | 40,025 | 62,332 | 66,591 | 79,161 | 87,869 | 95,570 | 204 | 5,087 | 3,057 | 2,572 | 2,317 | 2,130 |
| **Turkmenistan** | 2,520 | 4,156 | 4,459 | 5,815 | 6,287 | 6,765 | 25 | 9,802 | 5,539 | 4,247 | 3,929 | 3,651 |
| **Uganda** | 11,183 | 19,464 | 21,778 | 39,431 | 44,435 | 47,703 | 66 | 5,902 | 3,031 | 1,674 | 1,485 | 1,384 |
| **Ukraine** | 49,016 | 51,254 | 50,456 | 44,461 | 45,688 | 48,392 | 140 | 2,848 | 2,767 | 3,140 | 3,056 | 2,885 |
| **United Arab Emirates** | 505 | 2,260 | 2,441 | 3,074 | 3,284 | 3,492 | 0 | 297 | 61 | 49 | 46 | 43 |
| **United Kingdom** | 56,226 | 58,431 | 58,830 | 56,775 | 59,961 | 63,243 | 71 | 1,263 | 1,207 | 1,251 | 1,184 | 1,123 |
| **United States of America** | 220,165 | 269,439 | 278,357 | 304,412 | 325,573 | 350,084 | 2,478 | 11,255 | 8,902 | 8,140 | 7,611 | 7,078 |
| **Uruguay** | 2,829 | 3,242 | 3,337 | 3,614 | 3,907 | 4,187 | 124 | 43,839 | 37,158 | 34,313 | 31,741 | 29,618 |
| **Uzbekistan** | 13,981 | 22,848 | 24,318 | 30,779 | 33,355 | 35,978 | 50 | 3,605 | 2,073 | 1,638 | 1,511 | 1,401 |
| **Venezuela** | 12,734 | 173 | 24,170 | 31,724 | 34,775 | 37,514 | 1,317 | 103,421 | 54,490 | 41,514 | 37,872 | 35,107 |
| **Vietnam** | 48,030 | 22,311 | 79,832 | 96,721 | 108,037 | 118,521 | 891 | 18,555 | 11,163 | 9,214 | 8,249 | 7,519 |
| **Yemen** | 6,991 | 75,159 | 18,112 | 36,000 | 38,985 | 41,764 | 4 | 586 | 226 | 114 | 105 | 98 |
| **Yugoslavia** | 9,085 | 15,674 | 10,640 | 10,151 | 10,844 | 11,671 | - | - | - | - | - | - |
| **Zambia** | 4,841 | 8,389 | 9,169 | 14,119 | 15,616 | 16,964 | 116 | 23,961 | 12,652 | 8,216 | 7,428 | 6,838 |
| **Zimbabwe** | 6,143 | 11,045 | 11,669 | 13,440 | 15,092 | 16,441 | 20 | 3,256 | 1,714 | 1,488 | 1,325 | 1,216 |

[1]Australia includes Christmas Island, Cocos (Keeling) Islands and Norfolk Island.
[2]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).
[3]Denmark includes Greenland.
[4]Mauritius includes Agalega, Rodrigues and Saint Brandon.
[5]1996 population data were used only for per capita carbon emissions calculations.
[6] Please note that all arable land data for Belgium and Luxembourg are combined figures.
- no data or not applicable

| ARABLE LAND | | | | | | | FOREST | | | | CARBON DIOXIDE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arable land 1975 *(thousands of hectares)* | Arable land per capita 1975 *(hectares)* | Arable land 1997 *(thousands of hectares)* | Arable land per capita 2000 *(hectares)* | Arable land per capita 2025 (low population projection) *(hectares)* | Arable land per capita 2025 (medium population projection) *(hectares)* | Arable land per capita 2025 (high population projection) *(hectares)* | Forest cover 2000 *(thousands of hectares)* | Forest cover per capita 2000 *(hectares)* | Forest cover 2025 *(thousands of hectares)* | Forest cover per capita 2025 *(hectares)* | $CO_2$ emissions 1996 *(thousands of metric tons of carbon)* | $CO_2$ emissions per capita 1996 *(metric tons of carbon)* | Country |
| 2,350 | 0.49 | 2,266 | 0.24 | 0.14 | 0.14 | 0.13 | 7,141 | 0.75 | 6,053 | 0.36 | 836 | 0.10 | **Senegal** |
| 472 | 0.16 | 546 | 0.11 | 0.07 | 0.07 | 0.06 | 1,126 | 0.23 | 530 | 0.07 | 122 | 0.03 | **Sierra Leone** |
| 8 | 0.00 | 1 | 0.00 | 0.00 | 0.00 | 0.00 | 4 | 0.00 | 4 | 0.00 | 17,968 | 5.32 | **Singapore** |
| - | - | 1,605 | 0.30 | 0.31 | 0.30 | 0.28 | 2,001 | 0.37 | 2,063 | 0.38 | 10,820 | 2.02 | **Slovakia** |
| - | - | 285 | 0.14 | 0.16 | 0.16 | 0.15 | 1,077 | 0.54 | 1,077 | 0.59 | 3,559 | 1.78 | **Slovenia** |
| 50 | 0.26 | 60 | 0.14 | 0.08 | 0.07 | 0.07 | - | - | - | - | 44 | 0.11 | **Solomon Islands** |
| 975 | 0.24 | 1,061 | 0.11 | 0.05 | 0.05 | 0.05 | 748 | 0.07 | 719 | 0.03 | 4 | 0.00 | **Somalia** |
| 13,392 | 0.54 | 16,300 | 0.40 | 0.39 | 0.35 | 0.32 | 8,425 | 0.21 | 8,063 | 0.18 | 79,898 | 2.10 | **South Africa** |
| 20,833 | 0.59 | 19,164 | 0.48 | 0.53 | 0.52 | 0.49 | 8,388 | 0.21 | 8,388 | 0.23 | 63,451 | 1.60 | **Spain** |
| 1,910 | 0.14 | 1,888 | 0.10 | 0.08 | 0.08 | 0.08 | 1,700 | 0.09 | 1,293 | 0.05 | 1,932 | 0.11 | **Sri Lanka** |
| 12,215 | 0.76 | 16,900 | 0.57 | 0.39 | 0.37 | 0.35 | 39,922 | 1.35 | 32,442 | 0.70 | 948 | 0.03 | **Sudan** |
| 43 | 0.12 | 67 | 0.16 | 0.14 | 0.13 | 0.12 | 14,660 | 35.15 | 14,360 | 27.37 | 573 | 1.40 | **Suriname** |
| 170 | 0.35 | 180 | 0.18 | 0.11 | 0.10 | 0.09 | 146 | 0.14 | 146 | 0.08 | 93 | 0.10 | **Swaziland** |
| 3,006 | 0.37 | 2,799 | 0.31 | 0.32 | 0.31 | 0.29 | 24,413 | 2.74 | 24,353 | 2.68 | 14,776 | 1.67 | **Sweden** |
| 395 | 0.06 | 444 | 0.06 | 0.06 | 0.06 | 0.06 | 1,130 | 0.15 | 1,130 | 0.15 | 12,070 | 1.68 | **Switzerland** |
| 5,476 | 0.74 | 5,521 | 0.34 | 0.23 | 0.21 | 0.20 | 196 | 0.01 | 112 | 0.00 | 12,088 | 0.83 | **Syrian Arab Republic** |
| - | - | 890 | 0.14 | 0.11 | 0.10 | 0.09 | 410 | 0.07 | 410 | 0.05 | 1,595 | 0.27 | **Tajikistan** |
| 3,080 | 0.19 | 4,000 | 0.12 | 0.08 | 0.07 | 0.06 | 30,973 | 0.92 | 24,313 | 0.42 | 667 | 0.02 | **Tanzania, United Republic of** |
| 16,680 | 0.40 | 20,445 | 0.33 | 0.30 | 0.28 | 0.26 | 10,187 | 0.17 | 5,254 | 0.07 | 56,048 | 0.95 | **Thailand** |
| 2,360 | 1.03 | 2,430 | 0.52 | 0.31 | 0.29 | 0.27 | 1,158 | 0.25 | 808 | 0.10 | 205 | 0.05 | **Togo** |
| 115 | 0.11 | 122 | 0.09 | 0.09 | 0.08 | 0.08 | 149 | 0.12 | 101 | 0.07 | 6,069 | 4.78 | **Trinidad and Tobago** |
| 4,860 | 0.86 | 4,900 | 0.51 | 0.42 | 0.38 | 0.35 | 540 | 0.06 | 473 | 0.04 | 4,417 | 0.49 | **Tunisia** |
| 27,662 | 0.69 | 29,162 | 0.44 | 0.37 | 0.33 | 0.31 | 8,856 | 0.13 | 8,856 | 0.10 | 48,674 | 0.78 | **Turkey** |
| - | - | 1,695 | 0.38 | 0.29 | 0.27 | 0.25 | 3,754 | 0.84 | 3,754 | 0.60 | 9,346 | 2.25 | **Turkmenistan** |
| 5,407 | 0.48 | 6,810 | 0.31 | 0.17 | 0.15 | 0.14 | 5,822 | 0.27 | 4,594 | 0.10 | 282 | 0.01 | **Uganda** |
| - | - | 34,081 | 0.68 | 0.77 | 0.75 | 0.70 | 9,267 | 0.18 | 9,404 | 0.21 | 108,431 | 2.12 | **Ukraine** |
| 15 | 0.03 | 81 | 0.03 | 0.03 | 0.02 | 0.02 | 60 | 0.02 | 60 | 0.02 | 22,337 | 9.89 | **United Arab Emirates** |
| 6,954 | 0.12 | 6,425 | 0.11 | 0.11 | 0.11 | 0.10 | 2,456 | 0.04 | 2,813 | 0.05 | 152,015 | 2.60 | **United Kingdom** |
| 188,218 | 0.85 | 179,000 | 0.64 | 0.59 | 0.55 | 0.51 | 215,499 | 0.77 | 231,061 | 0.71 | 1,446,777 | 5.37 | **United States of America** |
| 1,437 | 0.51 | 1,307 | 0.39 | 0.36 | 0.33 | 0.31 | 812 | 0.24 | 802 | 0.21 | 1,540 | 0.48 | **Uruguay** |
| - | - | 4,850 | 0.20 | 0.16 | 0.15 | 0.13 | 10,409 | 0.43 | 20,169 | 0.60 | 25,922 | 1.13 | **Uzbekistan** |
| 3,570 | 0.28 | 3,490 | 0.14 | 0.11 | 0.10 | 0.09 | 41,614 | 1.72 | 31,509 | 0.91 | 17 | 0.10 | **Venezuela** |
| 6,240 | 0.13 | 7,202 | 0.09 | 0.07 | 0.07 | 0.06 | 8,488 | 0.11 | 5,936 | 0.05 | 39,438 | 1.77 | **Vietnam** |
| 1,460 | 0.21 | 1,555 | 0.09 | 0.04 | 0.04 | 0.04 | 9 | 0.00 | 9 | 0.00 | 10,274 | 0.14 | **Yemen** |
| - | - | 4,058 | 0.38 | 0.40 | 0.37 | 0.35 | 1,769 | 0.17 | 1,769 | 0.16 | 4,642 | 0.30 | **Yugoslavia** |
| 5,000 | 1.03 | 5,265 | 0.57 | 0.37 | 0.34 | 0.31 | 30,129 | 3.29 | 24,515 | 1.57 | 667 | 0.08 | **Zambia** |
| 2,565 | 0.42 | 3,210 | 0.28 | 0.24 | 0.21 | 0.20 | 8,467 | 0.73 | 7,350 | 0.49 | 5,025 | 0.45 | **Zimbabwe** |

## The 25 Global Hotspots and Major Tropical Wilderness Areas

| **Hotspot** (numbers)/**Wilderness area** (letters) | **Hotspot/Wilderness Area** *(thousands of square kilometers)* | **Human population, 1995** *(thousands)* | **Population density, 1995** *(per square kilometer)* | **Population growth rate, 1995-2000** *(percent per year)* |
|---|---|---|---|---|
| **1 Tropical Andes** | 1,415 | 57,920 | 40 | 2.8 |
| **2 Mesoamerica** | 1,099 | 61,060 | 56 | 2.2 |
| **3 Caribbean** | 264 | 38,780 | 136 | 1.2 |
| **4 Atlantic Forest Region** | 824 | 65,050 | 79 | 1.7 |
| **5 Chocó/Darién/Western Ecuador** | 134 | 5,930 | 44 | 3.2 |
| **6 Brazilian Cerrado** | 2,160 | 14,370 | 7 | 2.4 |
| **7 Central Chile** | 320 | 9,710 | 29 | 1.4 |
| **8 California Floristic Province** | 236 | 25,360 | 108 | 1.2 |
| **9 Madagascar and Indian Ocean Islands** | 587 | 15,450 | 26 | 2.7 |
| **10 Eastern Arc Mountains and Coastal Forests** | 142 | 7,070 | 50 | 2.2 |
| **11 Guinean Forests of West Africa** | 660 | 68,290 | 104 | 2.7 |
| **12 Cape Floristic Province of South Africa** | 82 | 3,480 | 42 | 2.0 |
| **13 Succulent Karoo** | 193 | 460 | 3 | 1.9 |
| **14 Mediterranean Basin** | 1,556 | 174,460 | 111 | 1.3 |
| **15 Caucasus** | 184 | 13,940 | 76 | -0.3 |
| **16 Sundaland** | 1,500 | 180,490 | 121 | 2.1 |
| **17 Wallacea** | 341 | 18,260 | 54 | 1.9 |
| **18 Philippines** | 293 | 61,790 | 198 | 2.1 |
| **19 Indo-Burma** | 2,313 | 224,920 | 98 | 1.5 |
| **20 Mountains of South-Central China** | 469 | 12,830 | 25 | 1.5 |
| **21 Western Ghats and Sri Lanka** | 136 | 46,810 | 341 | 1.4 |
| **22 Southwestern Australia** | 107 | 1,440 | 13 | 1.7 |
| **23 New Caledonia** | 16 | 140 | 8 | 2.1 |
| **24 New Zealand** | 260 | 2,740 | 11 | 1.0 |
| **25 Polynesia/Micronesia** | 46 | 2,900 | 58 | 1.3 |
| **A Upper Amazonia and Guyana Shield** | 5,830 | 14,750 | 3 | 3.9 |
| **B Congo Basin** | 2,886 | 54,040 | 18 | 3.0 |
| **C New Guinea and Melanesian Islands** | 906 | 6,120 | 6 | 2.6 |

## Global Fishing Data

| | **1970** | **1980** | **1990** |
|---|---|---|---|
| **Total global fish production in metric tons** (includes both aquaculture and marine catch) | 65,342,942 | 72,256,376 | 98,594,817 |
| **Fishers** | 13,000,000 | 17,000,000 | 29,000,000 |
| **Average tons of fish caught per fisher** | 5.23 | 4.25 | 3.40 |

# METHODOLOGY *and* DATA SOURCES

**This publication relies for population data on the national and world population estimates and projections of the United Nations Population Division from *World Population Prospects: The 1998 Revision*.[1] For the years from 1996 to 2000, this required the use of medium projections rather than estimates of actual population based on current demographic information. Any differences between such projections and future population estimates for these years are likely to be insignificant.**

## Fresh Water

Freshwater resource data come from *World Resources*,[2] a biennial publication of the World Resources Institute in cooperation with the World Bank and the United Nations. For countries in Asia, except those included in the Middle East, and the former Soviet Union, water data were taken from the Food and Agriculture Organization of the United Nations' *Irrigation in the Former Soviet Union in Figures*[3] and the FAO's *Irrigation in Asia in Figures*.[4] These data were more recent than those provided by WRI. UN population data include the 2000 medium projection and the low and high projections for 2025. For further information, see Population Action International's publications *Sustaining Water: Population and the Future of Renewable Water Supplies*[5] and *Sustaining Water, Easing Scarcity: A Second Update*.[6]

## Cropland

Data for arable land are from the FAO Statistical Databases 1998, produced by and available on CD-ROM from the United Nations Food and Agriculture Organization in Rome. UN population data represent the 2000 medium projection and the low and high projections for 2025. Data for The State of World Hunger map are from FAO's *The State of Food Insecurity in the World*.[7] For further information about methodology, see PAI's *Conserving Land: Population and Sustainable Food Production*.[8]

## Forests

Data on forest cover are based on the biannual publication of the United Nations Food and Agriculture Organization, *State of the World's Forests, 1999*.[9] Each country's total forest area in 2000 and 2025 was calculated by applying the FAO rate of forest area change in each country for the most recent period available (1990-1995) to its total forest area in 1995. These data formed the basis for calculating per capita forest cover—the forest-to-people ratio—for the countries charted in the section on people and forests. The forest-to-people ratios are based on a country's total population (using the medium population projection) compared to its total forest area. For further information, see PAI's *Forest Futures: Population, Consumption and Wood Resources*.[10]

## Fisheries

Data for A World of Declining Fisheries were derived from the Fishstat Plus database, "Total production 1950-1998," which is available on CD-ROM from the FAO in Rome.[11] Data used for the period up to 1995 came from "Catches and Landings," in the *FAO Yearbook of Fishery Statistics*, Vol. 80.[12] The data for "Fish Protein as a Percentage of Total Protein Intake in 26 Countries" came from *1961-1997 Fish and Fishery Products*.[13] The data for "More Fishers Fishing, Fewer Fish Caught" came from *FAO Fisheries Circular No. 929 Revision 1999*.[14] The data for "Real and Projected Trends in Global Per Capita Fish Production: 1950-2010" came from the FAO's Fisheries Department.[15]

## Carbon

The carbon dioxide emissions data are from the Carbon Dioxide Information Analysis Center (CDIAC),[16] a data center with the U.S. Department of Energy that monitors fossil-fuel and other climate-change-related production issues worldwide. Population data are from the UN Population Division's medium projection. For further information about methodology, see PAI's *Stabilizing the Atmosphere: Population, Consumption and Greenhouse Gases*[17] and *Profiles in Carbon: An Update on Population, Consumption and Carbon Dioxide Emissions*.[18]

## Biodiversity

Population densities for the biodiversity hotspots were estimated using the Gridded Population of the World, 1995, a geographic information systems (GIS) data layer developed at the National Center for Geographic Information Analysis, University of Santa Barbara, and the Center for International Earth Science Information Network, based at Columbia University in New York.[19] Hotspot boundaries were provided by Conservation International and were drawn by ecologist Norman Myers and Russell A. Mittermeier, Cristina G. Mittermeier and Gustavo A. B. da Fonseca of Conservation International. Sub-national growth rates were estimated using several sources: local growth rate estimates, census enumeration and local projections. Where provincial data were unavailable or unnecessary, rates were obtained from national estimates published by the UN Population Division. For further information on methodology, see *Nature's Place: Human Population and the Future of Biological Diversity*.[20]

[1] United Nations Population Division, *World Population Prospects: The 1998 Revision* (New York: United Nations, 1998).

[2] World Resources Institute, *World Resources 1998-99* (New York: Oxford University Press, 1998).

[3] Food and Agriculture Organization of the United Nations, *Irrigation in the Countries of the Former Soviet Union in Figures* (Rome: FAO, 1997).

[4] Food and Agriculture Organization of the United Nations, *Irrigation in Asia in Figures* (Rome: FAO, 1999).

[5] Robert Engelman and Pamela LeRoy, *Sustaining Water: Population and the Future of Renewable Water Supplies* (Washington, DC: Population Action International, 1993).

[6] Tom Gardner-Outlaw and Robert Engelman, *Sustaining Water, Easing Scarcity: A Second Update* (Washington, DC: Population Action International, 1997).

[7] Food and Agriculture Organization of the United Nations, *Food Insecurity: When People Must Live With Hunger and Fear Starvation* (Rome: FAO, 1999).

[8] Robert Engelman and Pamela LeRoy, *Conserving Land: Population and Sustainable Food Production* (Washington, DC: Population Action International, 1995).

[9] Food and Agriculture Organization of the United Nations, *State of the World's Forests, 1999* (Rome: FAO, 1999).

[10] Tom Gardner-Outlaw and Robert Engelman, *Forest Futures: Population, Consumption and Wood Resources* (Washington, DC: Population Action International, 1999).

[11] http://www.fao.org/fi/statist/statist.asp last accessed June 5, 2000.

[12] Data provided by Edmondo Laureti, FAO, personal communication.

[13] Edmondo Laureti, *1961-1997 Fish and Fishery Products: World Apparent Consumption Statistics Based on Food Balance Sheets* (Rome: FAO, 1999).

[14] Food and Agriculture Organization of the United Nations, *FAO Fisheries Circular No. 929 Revision 1999* (Rome: FAO, 1999).

[15] Food and Agriculture Organization of the United Nations, "Projection of World Fishery Production in 2010," available at http://www.fao.org/fi/highligh/2010.asp, last accessed on June 5, 2000.

[16] Carbon Dioxide Information Analysis Center, *Global, Regional, and National Annual $CO_2$ Emissions from Fossil-Fuel Burning, Hydraulic Cement Production, and Gas Flaring: 1751-1996*, available at http://cdiac.esd.ornl.gov/ftp/ndp030/nation96.ems, last accessed on June 5, 2000.

[17] Robert Engelman, *Stabilizing the Atmosphere: Population, Consumption and Greenhouse Gases* (Washington, DC: Population Action International, 1994).

[18] Robert Engelman, *Profiles in Carbon: An Update on Population, Consumption and Carbon Dioxide Emissions* (Washington, DC: Population Action International, 1998).

[19] For further information about this data layer, see Waldo Tobler, Uwe Deichmann, Jon Gottsegen, and Kelly Maloy, *The Global Demography Project*, National Center for Geographic Information and Analysis, University of California, Santa Barbara, at ftp://ncgia.ucsb.edu/pub/Publications/tech_reports/95/95-6/95-6.txt, last accessed on June 5, 2000.

[20] Richard P. Cincotta and Robert Engelman, *Nature's Place: Human Population and the Future of Biological Diversity* (Washington, DC: Population Action International, 2000).

# SELECTED RECENT PUBLICATIONS *from Population Action International*

## Population & Environment Studies

### NEW! Nature's Place: Human Population and the Future of Biological Diversity

Reviews the scientific evidence about the role of human population change in the extinctions of the recent past, considers the risks to the future of biodiversity conservation, and recommends ways to help to minimize these risks. Includes map and analysis of human population density and growth in the world's 25 biodiversity hotspots. (2000. 80 pp. *English* $9.00)

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### Plan and Conserve: A Source Book on Linking Population and Environmental Services in Communities

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### Forging the Link: Emerging Accounts of Population and Environment Work in Communities

Examines feasibility of integrating reproductive health and environmental sustainability into the same development project. Summarizes efforts of last 25 years and explores benefits and challenges of approach. (1999. 56 pp. *English*. $7.00)

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### Educating Girls: Gender Gaps and Gains

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# About Population Action International

Population Action International (PAI) is an independent research and advocacy organization working to make clear the linkages between population, reproductive health, the environment, and development in order to foster support for family planning and population programs worldwide. Founded in 1965, PAI is a private, non-profit group and accepts no government funds.

At the heart of PAI's mission is its commitment to the expansion of voluntary family planning, other reproductive health services, and of educational and economic opportunities for girls and women. Together these strategies promise to improve the lives of individual women and their families while also slowing the world's population growth.

To these ends, PAI seeks to increase global political and financial support for effective population policies and programs grounded in individual rights.

PAI fosters the development of U.S. and international policy on urgent population and reproductive health issues through an integrated program of research, public education and advocacy. PAI reaches out to government leaders and opinion makers through coalitions with other development, reproductive health and environmental organizations, the dissemination of strategic, action-oriented publications, and broader efforts to inform public opinion.


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Sally Ethelston, Odell Gilliam

**Designer**
AURAS, Silver Spring, Maryland

**Printed By**
Steckel Printing Inc., Lancaster, Pennsylvania

*Photographs on back cover by (from left to right):*
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# FERTILE CROPLAND,
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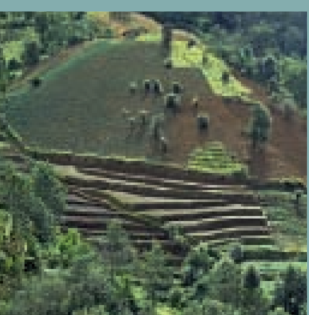
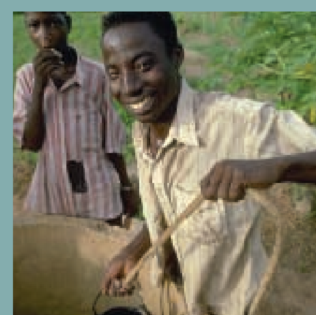
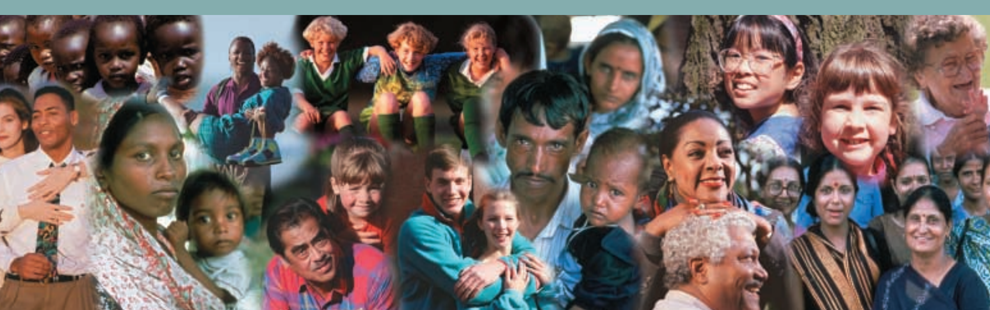


**The author of *People in the Balance* is Robert Engelman, vice president for research at Population Action International and founding board member of the Center for a New American Dream. Ecologist Richard P. Cincotta, Ph.D., natural resource analyst Tom Gardner-Outlaw, and research assistants Bonnie Dye and Jennifer Wisnewski, all of PAI, contributed to the research and writing.**





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