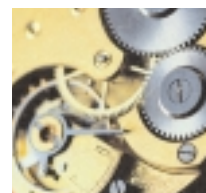
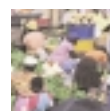
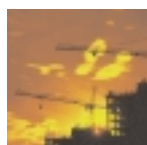




# TOMORROW'S MARKETS

Global Trends and Their Implications for Business



World Resources Institute



United Nations  
Environment Programme



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Sustainable Development





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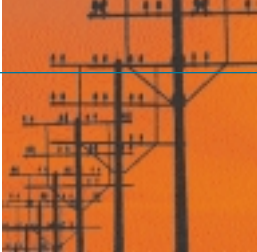
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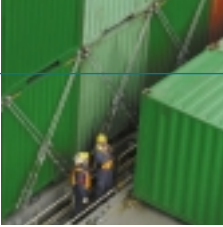


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**Jonathan Lash**  
PRESIDENT  
World Resources Institute

Partners' Foreword

Our three organizations join with this publication to communicate the trends that are shaping the global business environment. The future's successful companies will be led by people with the vision to combine the case for sustainable growth with personal and social values to create a powerful business case for change and innovation. *Tomorrow's Markets* shows that future growth will be in the competitive space in which winners are those that create value without environmental costs.

The shadows of environmental degradation, poverty, and lack of economic opportunity lie across the regions of the world that are fertile ground for ethnic conflicts, hatred, and violence. The private sector has a more important role than ever before to develop products and practices and to support policies that protect and restore the environment, that eradicate poverty, and that create a fair and transparent society. The challenge of the future is to choose a course that satisfies the market requirements for growth, maintains the natural balance that sustains our economies, and meets the needs and rights of global communities awakening to new dreams of health, prosperity, and peace. *Tomorrow's Markets* is a call for action and a sign of opportunity for the tremendous creative and innovative capacity of the business community.



**Björn Stigson**  
PRESIDENT  
World Business Council  
for Sustainable Development

Many cases can be made for sustainable development; yet, being a business council, we have worked to define the business case for sustainable development. The business case is an entrepreneurial position. It looks at how business can be more competitive by being more sustainability-driven. It covers themes such as eco-efficiency, the role of global and capital markets, corporate social responsibility, transparency, innovation and technology, sound environmental management, and new partnerships, to name a few.

We live in a world of rapid change and our future is uncertain. Business leaders need to identify the fundamental signals that influence their future success and drive their innovation.

The WRI report, produced in partnership with UNEP, looks beyond daily preoccupations and identifies key trends that shape the business agenda. It does this in a concise and lively format.

As encapsulated in its title, we hope the facts and trends presented in this report will help to shape the markets of the future by providing companies with intelligent information to devise better corporate strategies and identify new business opportunities.

**Klaus Töpfer**  
EXECUTIVE DIRECTOR  
United Nations  
Environment Programme

Access to reliable and timely information is increasingly important in our globalised world. For policy-makers and business leaders alike, recognising the trends that shape the marketplace and understanding the reasons behind them are more important than ever.

This is why UNEP is pleased to join forces with the WBCSD and WRI in producing this new publication, which builds on UNEP's Third Global Environment Outlook report to be launched later this year. We have concentrated on making the links between environmental, economic and social trends.

The World Summit on Sustainable Development is fast approaching, and 2002 promises to be a landmark year for environmental protection and poverty alleviation. With increasing interest in new public-private partnerships, the Summit in Johannesburg is expected to address the relationship between industry and the environment, and innovative ways of dealing with complex socio-economic issues.

Sustainable development also makes good business sense. The facts and trends presented in this new publication make it clear that we cannot go on as we have thus far. I hope they will also help business leaders to better understand the inter-relationships between environment and development issues, and therefore respond more effectively to the enormous challenges before us.



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## Preface by Michael Porter HARVARD BUSINESS SCHOOL

**W**hat is the relationship between corporate strategy and societal issues such as the environment, poverty, health, population, and international development? Business leaders have a tendency to see “social” concerns as having little relevance to competing. Instead, these fall under the headings of corporate citizenship or corporate philanthropy, or are left to managers to address as matters of individual conscience.

It is becoming more and more apparent, however, that treating broader social issues and corporate strategy as separate and distinct has long been unwise, never more so than today. Seeing strategy narrowly leads to missed opportunities and bad competitive choices. It can also cause managers to overlook potential competitive advantages.

The same disconnect between social and corporate is also common among leaders in the social sector. There is a tendency to view firms as adversaries — not as allies in advancing social causes. Yet we are learning that the most effective way to address many of the world’s most pressing problems is to mobilize the corporate sector in a context of rules, incentives, and partnerships where both companies and society can benefit.

In modern competition, economic and social policy can and must be integrated. Consider some examples. Controlling pollution and the emission of greenhouse gases is often viewed by firms as a social issue, and resisted as driving up the cost of doing business. Environmentalists, who often believe companies seek to profit from polluting, see their role as advocating regulations to compel companies to install available abatement technology whatever the cost.

**We are learning that the most effective way to address many of the world’s most pressing problems is to mobilize the corporate sector where both companies and society can benefit.**

Yet virtually all corporate pollution is a sign of economic waste and the unproductive use of resources, and can be addressed with better technology or improved methods. Forcing companies to install abatement technologies is usually the wrong approach; the better approach is product or process innovation. The same is true with the use of energy, the cause of most greenhouse gas emissions.

Innovative corporate practices in the area of the environment, then, will often enhance internal competitiveness. Products that address environmental scarcities will also have enormous market potential. This means that companies should see environmental protection as an opportunity, while environmentalists need to recognize that progress on environmental improvement will be most rapid if they work cooperatively with companies. Governments in developing countries must understand that strategies of environmental degradation lead to continued poverty, not successful economic development.

Similar conclusions apply to other social concerns areas such as racial and ethnic discrimination, worker health and safety, and training. For example, looming labor shortages in advanced nations give companies strong incentives to hire and train minorities, as long as social advocates do not create unnecessary legal and regulatory risks of employing such individuals.

Not only can corporate and social needs be integrated, but the success of the developing world in improving prosperity is of fundamental strategic importance to almost every company. The world economy is not a zero sum game in which one country’s success comes at the expense of others. There is enormous potential for growth if many countries can improve in productivity and trade with one another. There are huge unsatisfied human needs to be met in the world, and demand will only increase as more nations become more prosperous.

Social and corporate also come together in the controversial areas of globalization. Social activists, not just companies, have a major stake in the openness and fairness of the international trading system. The evidence is compelling. Compared to local companies in developing countries, foreign companies bring higher environmental standards, pay and treat their workers better, and employ safer workplace practices. If social activists have improving these conditions as their true objectives, they will work with international companies rather than oppose them

**Not only can corporate and social needs be integrated, but the success of the developing world in improving prosperity is of fundamental strategic importance to almost every company.**

The volume provides a fascinating and important foundation of data that will help to highlight and help leaders capitalize on these opportunities. It catalogs the market opportunity in addressing social needs, and the payoff to successful international development. It reveals the competitive advantages and economic benefits of innovations to improve environmental performance and better utilize scarce resources. It highlights the importance of democracy and the role of transparency to achieve such win-win progress.

Both the corporate and the social sectors will need to adopt new mindsets. This book provides an invaluable tool for doing so.

Michael E. Porter is the Bishop William Lawrence University Professor, based at Harvard Business School. A University professorship is the highest professional recognition that can be given to a Harvard faculty member. Professor Porter is a leading authority on competitive strategy and international competitiveness and is the author of 16 books and over 75 articles.



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# People and Tomorrow's Markets



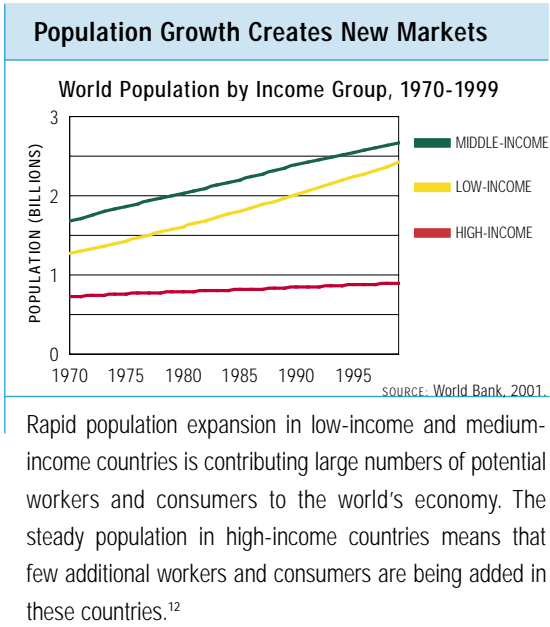
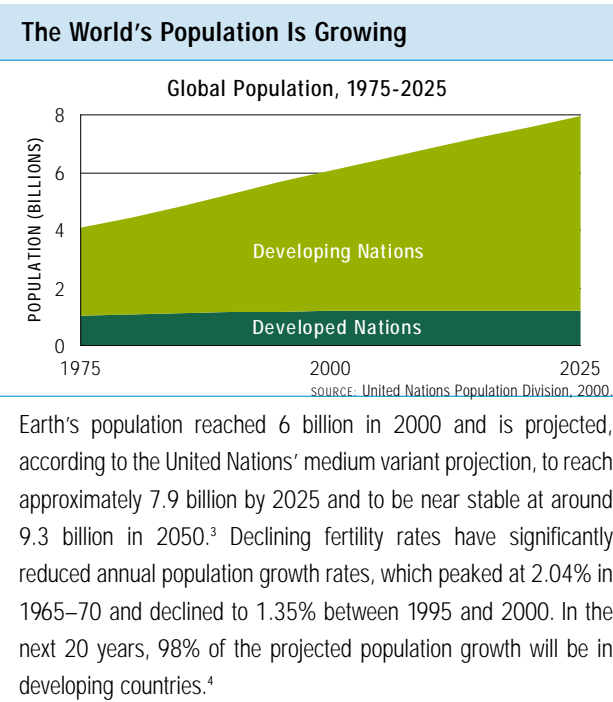
## SERVING SOCIETY

- Population
- Wealth
- Nutrition
- Health
- Education

Future consumer markets and labor will be concentrated in the fast-growing, emerging markets where small and large enterprises will find profitable opportunities to help meet health, education, and nutrition needs. These markets will favor businesses that partner with government and civil society to serve basic needs, enhance human skills, increase economic capacity, help remedy inequities, and conserve the environment.



We live in a world of continued population growth, even as fertility rates decline worldwide. In 25 years the population is estimated to reach about 8 billion — a third larger than today.<sup>1</sup> Population dynamics are at the root of almost every world trend shaping tomorrow's markets; population growth affects the environment and the health, nutrition, education, and wealth of the world's citizens. In the next 20 years, populations will shrink or barely grow in the high-income countries (Gross National Income (GNI) per capita  $\geq$  US\$9,266) and most of the world's citizens will be born in low- (GNI per capita  $\leq$  US\$755) and medium-income economies (GNI per capita US\$756-9,265).<sup>2</sup> To maximize the potential of low- and medium-income labor and consumer markets will require the development of a skilled work force and products and services tailored to people's basic needs and to the needs of an expanding middle class (see **Wealth**). Developing countries will need to nurture their domestic industries to serve their own population and today's multinational companies will need to develop appropriate strategic, technical, operational, and marketing competencies to operate in these new markets.



Expanding population in developing regions will create large markets dominated by the young.

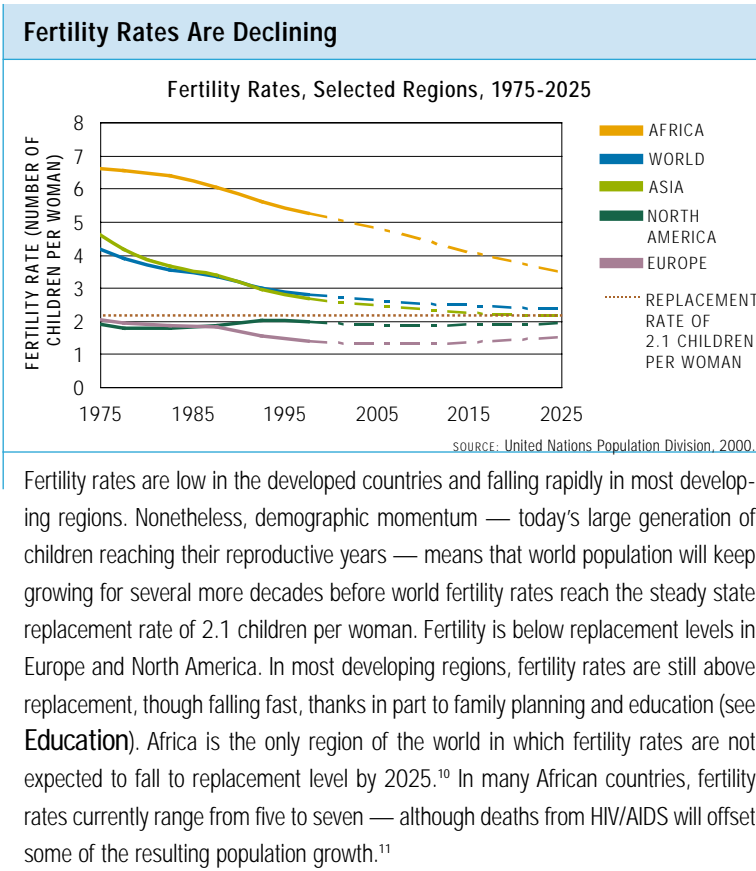


2.4 billion of today's total population of 6.2 billion people are children and teenagers.

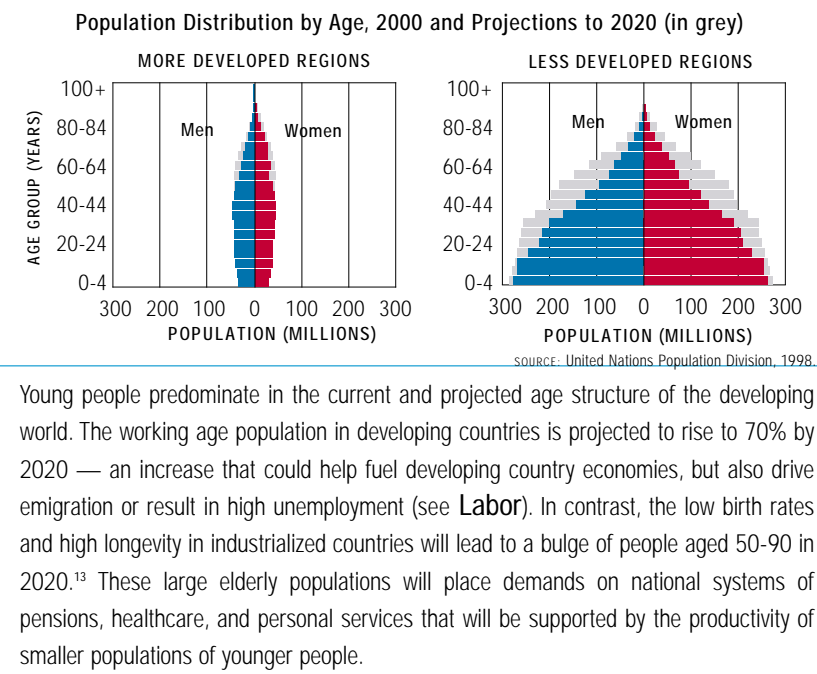
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Facts

- More than 80% of the world's people currently live in developing countries and 85% will live in developing countries by 2025.<sup>5</sup>
- 2.4 billion of today's total population of 6.2 billion people are children and teenagers.<sup>6</sup>
- Two out of five people in the world live in either China or India.<sup>7</sup>
- World fertility rates have declined from about 4 children per woman in 1975 to less than 3 children per woman in 2000.<sup>8</sup>
- Between 1990-1995, 40% of population growth in high-income countries was due to migration, while in low-income countries, migration reduced population growth by about 3%.<sup>9</sup>



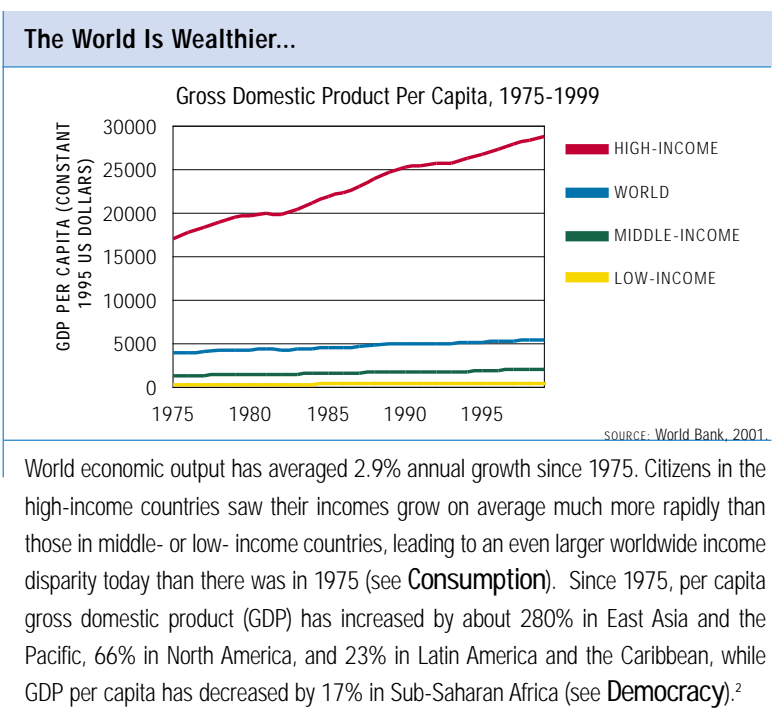
Changing Age Structures Will Bring Social And Economic Shifts



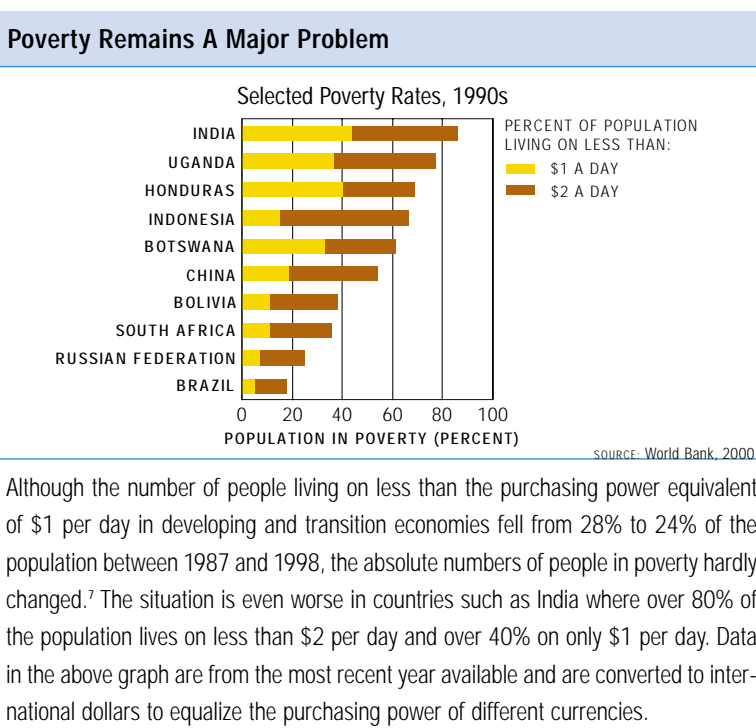
Implications for Business

Population dynamics are both a major force shaping the terrain of international markets and are at the root of society's greatest economic and social challenges. The growing population of young people in developing countries represents major new labor and consumer markets for business, particularly as traditional developed country markets shrink with declining populations and become characterized by an increasing proportion of the elderly. To build developing country markets, large and small national and international enterprises must support stable employment and supply people with products and services that meet basic needs, are affordable, accessible, and are culturally appealing.

The world is getting wealthier and the economies of poor countries are developing, yet within regions and within countries, income disparity is often great and the absolute number of people living in poverty is very high. Low- and middle-income countries often lack the resources to eliminate problems such as rapid population growth, inadequate education, high incidence of malnutrition and poor health, corruption and political instability, and destruction of natural resources. High levels of income inequality limit the poverty-reducing effects of growth and it has been estimated that high inequality countries will need to grow twice as fast as low inequality ones to halve poverty by 2015.<sup>1</sup> To make stability and prosperity a global reality will require protecting the resource base and ensuring that people in low-income countries have the opportunities and the freedoms (see **Democracy**) to raise their living standards and to fully participate in the international community and global marketplace.



- ### Facts
- World economic output more than doubled in the past 25 years, to about US\$33 trillion by 1999.<sup>3</sup>
  - In the 1990s, household consumption (the market value of all goods and services purchased by households) grew annually at 3.7% in low-income countries, 4.1% in middle-income countries and 2.3% in high-income countries.<sup>4</sup>
  - The world is 78% poor (average purchasing power parity income less than US\$3,470 annually), 11% middle income, and 11% rich (average purchasing power parity income more than US\$8,000 annually).<sup>5</sup>
  - The richest 1% of the population receive as much income as the entire bottom 57%; i.e., less than 50 million richest people receive as much income as 2,700 million poor.<sup>6</sup>



Global wealth is rising  
but the income gap grows wider.

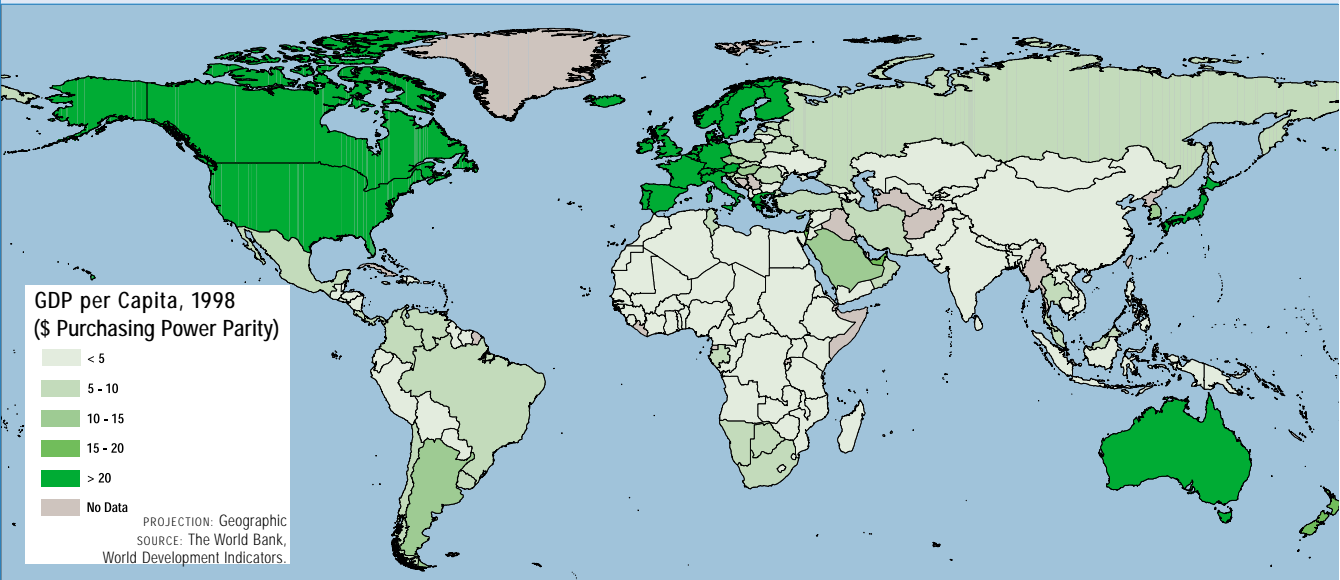


The world is 78% poor,  
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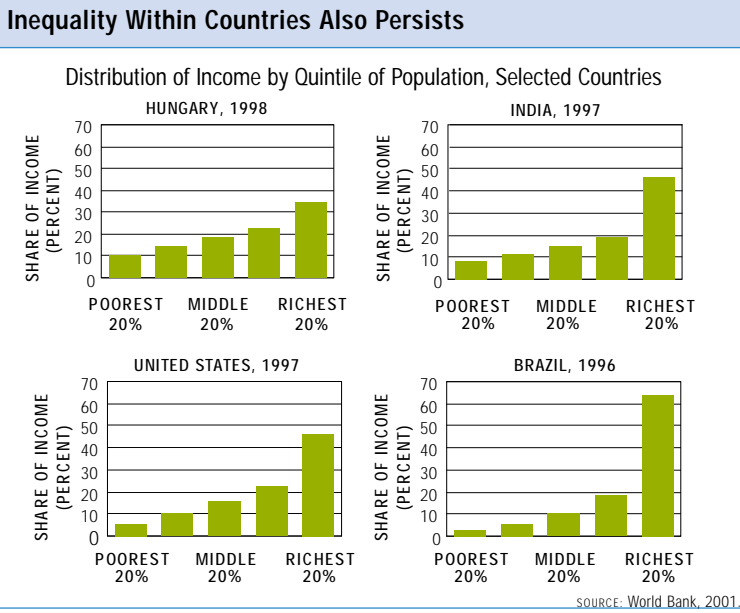


RELATED TRENDS	
Consumption	22
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World Map of Gross Domestic Product, 1998



The map above shows gross domestic product in five GDP categories for the world's countries in 1998. A comparison of this map with the map of projected water scarcity in 2025 (see **Water**, page 37) and the map of projected urban growth in 2015 (see **Urbanization**, page 41) hints at the convergence and connection of social, economic, and environmental challenges faced by many countries in Asia, the Middle East, Africa, and South America.



In addition to the unequal distribution of income among countries, distribution within countries is also unequal. For example, the poorest fifth of Brazilians receive only 3% of the income while the richest fifth have access to more than 60%. The poorest fifth of the United States receive 5% of the national income while the richest 20% receive about 46% of national income.<sup>8</sup>

### Implications for Business

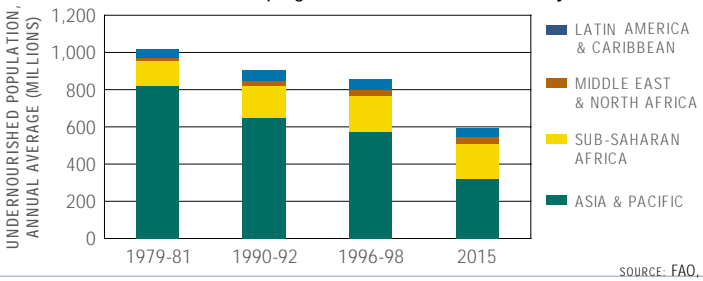
Long-term business growth and fair access to opportunity requires bringing millions of people into the global economy and narrowing the income gap between citizens in high- and low-income countries. The expanding middle- and lower-income consumers represent potential markets, and developing affordable goods and services for those markets can drive innovation, new business models, and business growth. Examples include emerging markets for photo-voltaic generators and renewable energy for small scale applications, fuel efficient stoves, water sanitation and personal hygiene products, mobile communications, and Internet access in low-income country markets. However, the conditions for free markets may be threatened by widening income inequalities and economic failures that foster violent conflict and erode democracies and the rule of law. Enduring worldwide progress — economic as well as social — depends on alleviating poverty.



Although world food supplies have grown faster than population, millions of people who might be engaged in learning, commerce, and building a stronger society are malnourished and spend their lives on basic survival. The most widely recognized cause of malnutrition is poverty — lack of the means, land ownership, and knowledge to produce or obtain food. Yet there are other environmental and social factors at work, too, including land scarcity and degradation, water scarcity, drought, and war. Political factors strongly influence the distribution of food and subsidies and trade protection may also hinder the development of resource-efficient agriculture and food distribution. Meeting food needs in poor countries will require new and creative investments in agriculture and food production and distribution. The international business community has and will be called upon to play both a commercial and a humanitarian role in solving the problems of malnourishment.

### Progress In The Fight Against Hunger

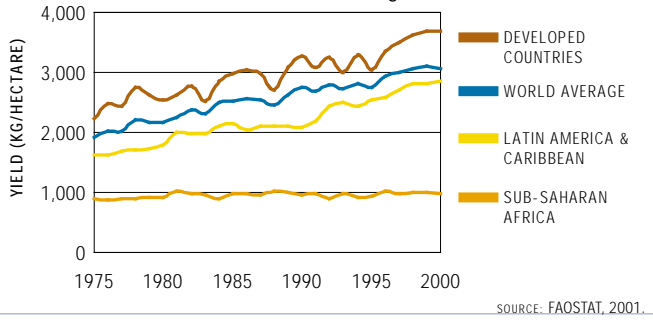
Undernourishment in Developing Countries, 1979-98 and Projections to 2015



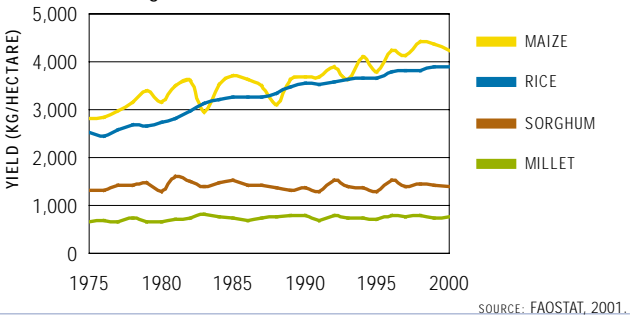
Improved technology, higher incomes, and better policies have helped enhance nutrition for many who could not meet their daily nutrition needs (undernourished) and the decline in the number of undernourished is projected to continue in the coming decades. However, where incomes have been stagnant and population growth rapid, as in Sub-Saharan Africa, the actual number of malnourished people has grown. Countries with improved nutritional status also had larger increases in secondary school enrollment of women.<sup>1</sup> Under-nutrition and food insecurity is also persistent in the Central Asian states of the former Soviet Union due to economic crises.<sup>2</sup> The disparity in supplies of protein-rich meat and milk products is particularly acute between rich and poor.<sup>3</sup>

### Is The 30-Year Increase In Grain And Cereal Yields Ending?

Cereal Yields, World and Selected Regions, 1975-2000



Average Yield of Selected Cereals, 1975-2000



Between 1961 and 1990, global cereals production increased 120%. The average yield per hectare rose 90% in developed countries and 120% in developing countries, though yields in developing countries remain about one third lower than in developed regions. However, to meet nutritional needs, production increases are shared by a growing population and yields per capita grew about 60% in developed countries and only about 10% in developing countries from 1961-1990. In Sub-Saharan Africa, per capita cereal production for food, feed, and seed has

actually fallen 11% since 1975. African farmers often cannot afford inputs like fertilizers, and many traditional African crops, such as millet and sorghum, have not been the focus of public and private research as have maize and rice (see **Agriculture**). Since about 1995, cereal production and yields have been relatively stable worldwide, raising concerns that the modern agricultural inputs of fertilizers, irrigation, mechanization, selective breeding, and pesticides have reached their limits to increase production.<sup>11</sup>



Millions are malnourished amidst an abundance of food.



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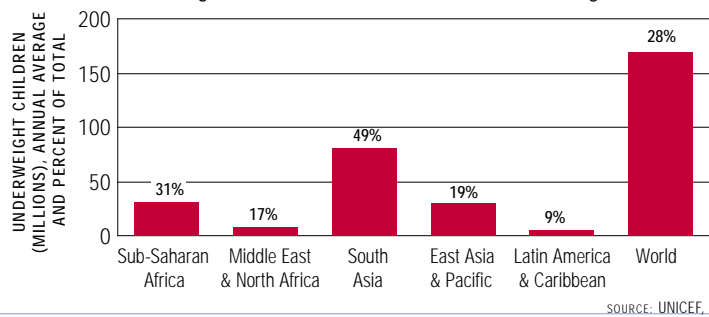
### Facts

- Although individual consumption levels vary enormously, the world produces enough protein to supply everyone with about 75 grams per day.<sup>4</sup>
- In 1998, 791 million of the 826 million undernourished people lived in the developing world.<sup>5</sup>
- Worldwide, about 160 million children under the age of five were malnourished in 1995, a total that is expected to decline only about 15 percent to 135 million by 2020.<sup>6</sup>
- Iron deficiencies in children and adults result in economic losses equal to 1% of GDP in Pakistan, and 2% of GDP in Bangladesh.<sup>7</sup>

In 1998, 791 million of the 826 million undernourished people lived in the developing world.

### Childhood Nutrition Varies By Region

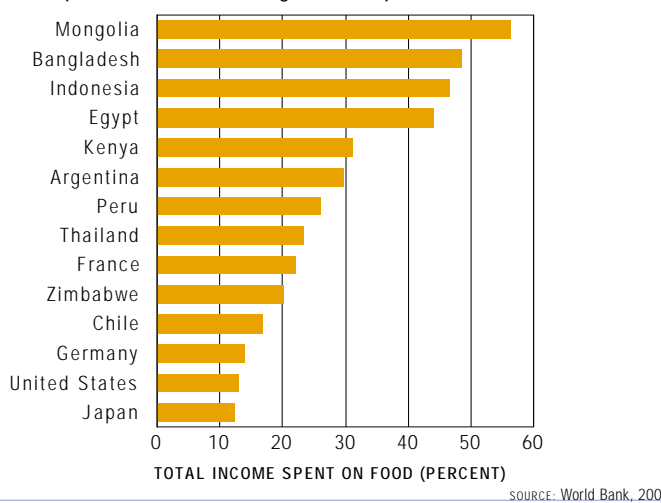
Number and Percentage of Children Under Five that are Underweight, 1995-2000



Twenty-eight percent or about 170 million of the world's children under five years old are severely or moderately undernourished.<sup>8</sup> Malnourished children are more vulnerable to many childhood diseases, including diarrhea and measles.<sup>9</sup> Research has found that improved food availability and women's education is the best approach to reducing child malnutrition (see **Education**).<sup>10</sup> Childhood undernourishment and its link to impeded development and a lifetime of health problems has long-term negative effects on the productivity of families and economies (see **Health**).

### Feeding The Family Strains Some Budgets

Food Expenditures as a Percentage of Per Capita Income, Selected Countries



In many developing countries, food purchases account for a huge proportion of family income, often 40-70% in the poorest countries.<sup>12</sup> While there are no standards by which to measure welfare based on expenditure, it is likely that when food exceeds one third of family income, health, education, leisure, transport, and housing suffer (see **Wealth**). The poor are also extremely vulnerable to food price shocks that can occur when crops or markets fail or when governments become unstable. Better nutrition, in turn, can mean greater income at the household and the national levels.

### Implications for Business

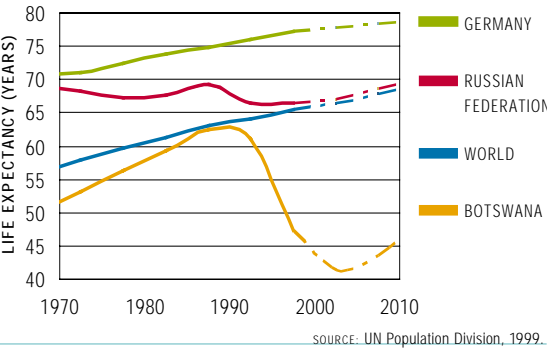
Economies and individuals cannot achieve their potential unless adequate nutrition is met. Food production, transport, and distribution is one of the largest business activities in the global economy but the food system is neither environmentally sustainable nor yet meeting all people's needs. Eliminating hunger will require major policy changes by national governments and the international community, and private sector investments in the food system. General private sector investment in economic development creates jobs and higher incomes to allow people to purchase food. For the broad array of industries involved directly in the food supply chain, supporting the development of markets in countries with high malnourishment is a critical contribution to worldwide economic growth and opportunity.

Despite a century of rapid progress in improving human health, many people do not have access to basic healthcare and basic hygiene to protect them from infectious agents in the environment. Infectious diseases conquered long ago in the industrialized world continue to kill millions in poor countries and to thwart the growth of fledgling economies. Many infectious diseases are exacerbated by environmental degradation ranging from urban air pollution and flooding, to contaminated water sources (see **Water**). The newest preventable worldwide killer is Acquired Immune Deficiency Syndrome (HIV/AIDS). In the 20 years since it was identified, HIV/AIDS has killed more than 21 million people and devastated the social fabric of some of the world's poorest nations.<sup>1</sup> HIV/AIDS is a grim reminder of the cost of disease: AIDS undermines economies by decreasing life expectancy, killing productive adults, raising costs for training and healthcare services, and reducing labor productivity due to absences for illness, caring for family members, and funerals.



On Average, We're Living Longer

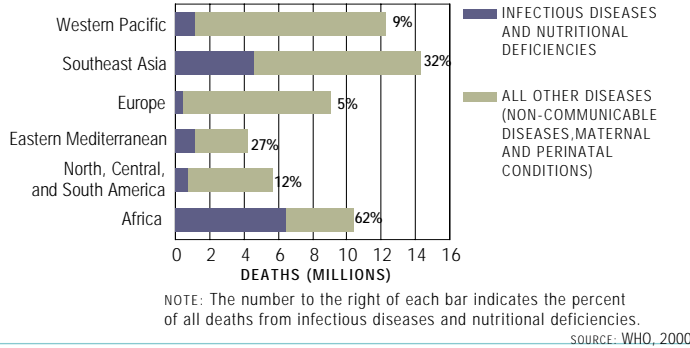
Life Expectancy, World and Selected Countries, 1970-2010



Average life expectancy has increased continuously since the 1950s, rising by about nine years since 1970. However, economic hardship and infectious disease can quickly halt or reverse progress. Life expectancy in Botswana was rising until HIV/AIDS took hold; declines in the Russian Federation are due to the impacts of economic downturns on healthcare, standard of living, and social institutions.

Disease Takes A Heavy Toll In Developing Countries

Cause of Death in Selected Regions, 1999



Improved nutrition, sanitation, water treatment, and insect control have virtually eliminated many previously deadly infectious diseases in wealthier countries, and education, medicines, condom use, and clean needles control the spread of HIV/AIDS. In many developing countries, where disease vectors are more prevalent and where governments cannot afford investments in public health and education, infectious diseases remain major causes of death (see **Water**).

Life expectancy rises,  
yet preventable disease continues  
to limit development.

World life expectancy rose  
from 47 years in 1950  
to an estimated 66 years in 2000.

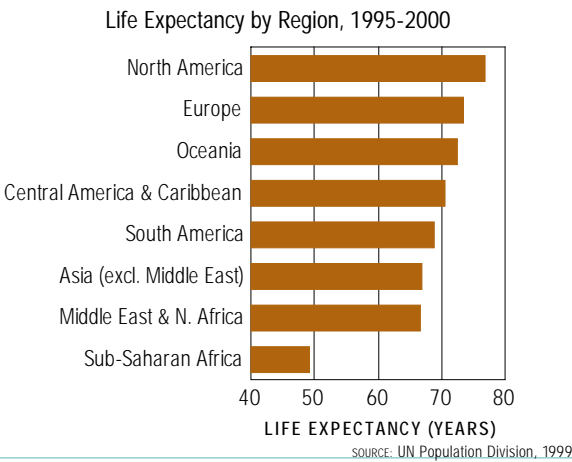
RELATED TRENDS

Emissions	26
Water	36
Mobility	42

Facts

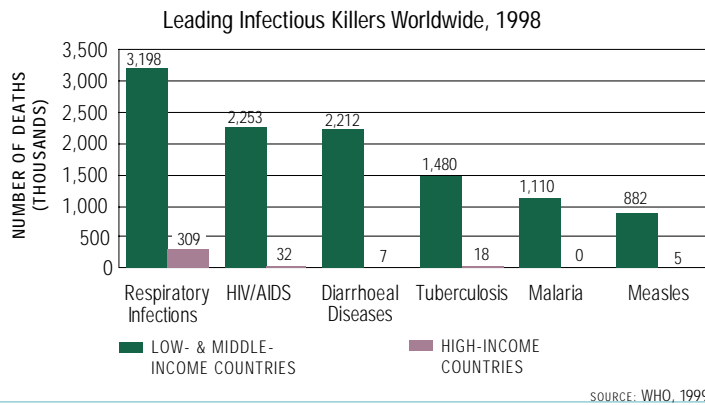
- World life expectancy rose from 47 years in 1950 to an estimated 66 years in 2000.<sup>2</sup>
- Cholera, almost eliminated by water treatment in the industrialized countries, is on the rise in poor countries. About 371,000 cases per year were reported in the mid-1990s, up from 100,000 per year in the 1980s.<sup>3</sup>
- Over 8 million new tuberculosis cases occurred in 2000 causing an estimated 2 million deaths, most aged 15 to 45; 99% of deaths occurred in the developing world.<sup>4</sup>
- More than 40 million people worldwide are living with the human immunodeficiency virus (HIV).<sup>5</sup> About one third are aged 15 to 24, on the brink of their most productive years as workers and citizens.<sup>6</sup>
- Tobacco is responsible for one in 10 adult deaths today. The figure is expected to be one in six in 2030 — more than any other cause of death. Seven of ten of these preventable deaths will be in low- and middle-income countries.<sup>7</sup>

World Life Expectancy Is Rising



The regional variation in how long children can expect to live is still very large as are differences within regions. Children born today in Eastern Africa can expect to live less than 50 years, compared to more than 75 years for their North American counterparts.<sup>8</sup>

HIV/AIDS: A Deadly Trend



HIV/AIDS has joined the list of the top causes of death worldwide such as diarrhea, tuberculosis, and measles which together claim almost 6 million lives annually.<sup>9</sup> The human and economic toll of HIV/AIDS in the most affected regions is staggering. Of the 36.1 million people infected with HIV worldwide in 2000, 25.3 million live in Sub-Saharan Africa and 5.8 million in South and Southeast Asia. The devastation caused by AIDS has been especially severe in Sub-Saharan Africa where nearly 70% of adults and 80% of children with HIV/AIDS live. The southern cone of the African continent has adult prevalence rates of at least 20%.<sup>10</sup> Good data is still scarce from most Asian countries, but AIDS deaths are rising rapidly in India, China, and elsewhere; deaths from AIDS among 15-49 year olds in Asia are projected to grow 57% from 2000 to 2005.<sup>11</sup>

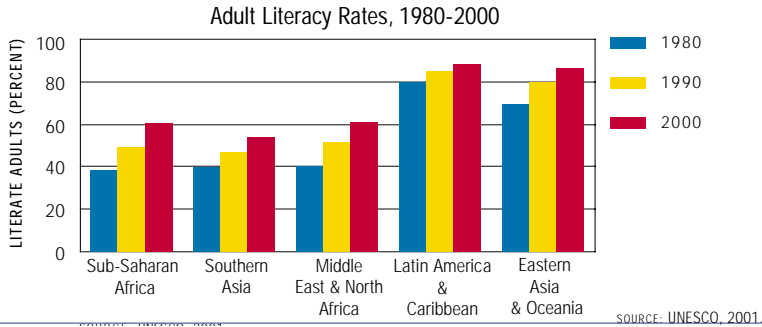
Implications for Business

The health of employees, customers, shareholders, and other stakeholders is a central concern for corporations because health directly affects productivity. The expansion of travel and trade provides new routes for the spread and re-emergence of infectious diseases and can turn seemingly national or regional health crises into global ones. HIV/AIDS has exposed the critical linkage between health and labor productivity and how disease deprives struggling societies of desperately needed know-how and labor in business, government, and education.<sup>12</sup> Improving health in the developing world means improving access to healthcare, improving health education and family planning services, providing widespread immunizations and clean water, and creating economic incentives for preventive medicine and sanitation. This is a strategic opportunity for the private corporations in sectors such as pharmaceuticals, health services, water infrastructure, and water sanitation who hold the technical solutions to major public health problems. However, business failure to act on an issue of public health that is within its means can itself become a damaging political and public issue.



Education helps ensure that people have the skills to be productive workers, informed consumers, responsible citizens, and stakeholders in government and business. An educated population produces and earns more, has lower fertility rates, is more effective in maintaining family health, and has greater choice in life decisions. While primary education is widespread, many children in emerging economies do not have opportunities for advanced learning, and in some regions girls have far less access to secondary education than boys. Within regions and countries with high levels of average school enrollment, there are often significantly under-served populations. The more advanced skills and learning afforded by secondary and tertiary schooling are ever more important as the world economy becomes more knowledge- and service-intensive.

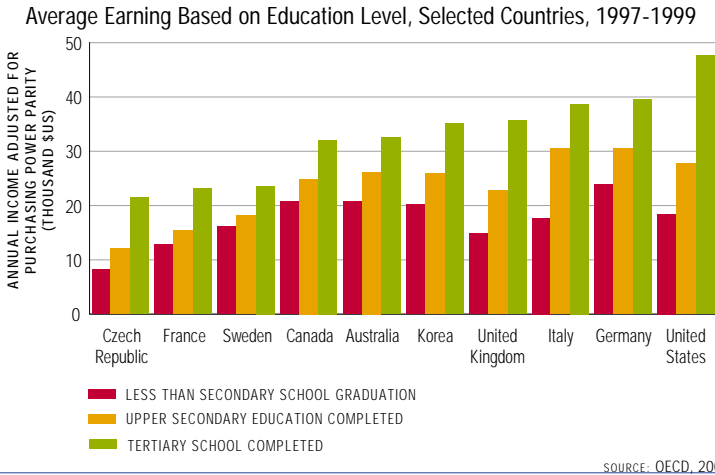
Literacy Rates Are Rising



World literacy rates have been rising for two decades, reflecting the increasing access to primary education. Literacy rates in Europe and North America are virtually 100% (not shown in figure). Almost 90% of adults can read in Eastern Asia and Oceania, Latin America, and the Caribbean. Literacy rates in much of the rest of the world lag behind; Southern Asian literacy rates are only slightly above 50%. The worldwide gender gap in primary education is shrinking — by 1997, more than 95% of girls attended primary schools, compared to 88% in 1980. But still nearly two thirds of the world's 880 million illiterate adults are women.<sup>1</sup> Literacy is also a proxy for the level of education of a country's potential labor force (see **Labor**).<sup>2</sup>



Educational Disparities Create An Income Gap In All Countries



Education provides people with opportunity to excel and opens the doors for economic advancement. While many social and economic factors influence this relationship, the relationship between advanced education and income is very strong (see **Wealth**).<sup>10</sup>



Primary education is widespread, but opportunities for learning elude many.

One of every five adults — a total of 880 million adults — is functionally illiterate. This is a dramatic improvement over 1970, when one of three was illiterate.

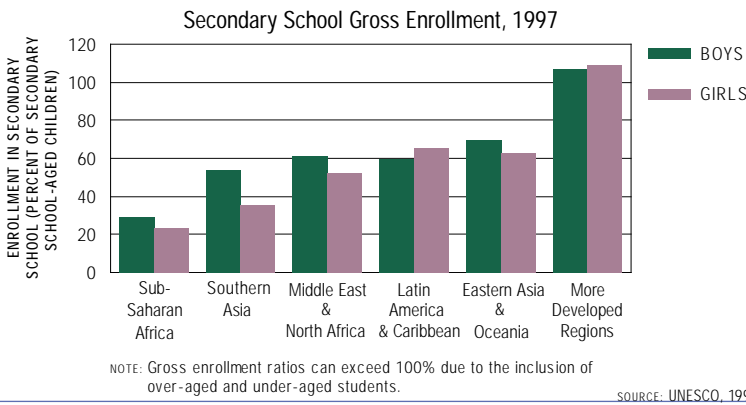
RELATED TRENDS

Labor	46
Communications	44
Accountability	52

Facts

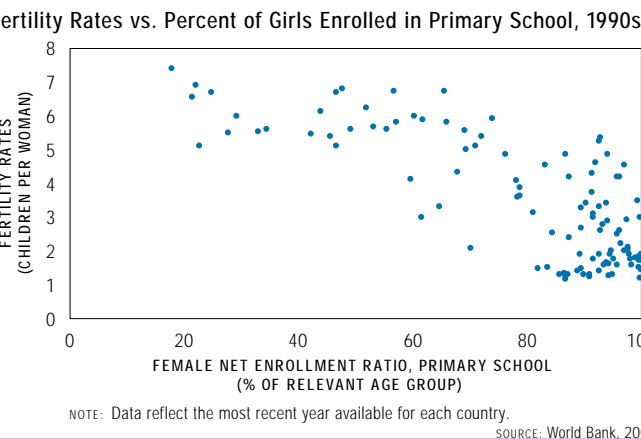
- 113 million children are out of school, 97% of them in less developed regions and 60% of them girls.<sup>3</sup>
- One of every five adults — a total of 880 million adults — is functionally illiterate. This is a dramatic improvement over 1970, when one of three was illiterate.<sup>4</sup>
- Enrollment rates for 6-14 year-olds is 52% lower for the poorest households, than for the richest households in Senegal, 36% lower in Zambia, 49% lower in Pakistan, and 63% lower in Morocco.<sup>5</sup>
- Much of the economic success of the “Asian tigers” may be due to their governments’ commitment to public funding of primary education as the foundation of development.<sup>6</sup>
- The few developing countries that participated in the Third International Mathematics and Science Study had the lowest scores at Grade 7 in the study; quality of education is as important as enrollment itself.<sup>7</sup>

Many Are Denied The Chance For Advanced Learning



In many developing countries and marginalized areas in the developed world, there are still major disparities in academic achievement that result from factors including inadequate teacher training and under-funding of schools and that prevent students from obtaining the knowledge and skills needed to function as productive citizens and workers.<sup>8</sup> While essentially all children receive secondary schooling in more developed regions, only about 60% of young people in Eastern Asia, Oceania, Latin America, and the Caribbean receive secondary schooling; Southern Asia and Sub-Saharan Africa enrollment rates are just 45% and 25%, respectively. The gender gap in secondary school enrollment is relatively small in East Asia, but significant disparities in access to education remain in South Asia, the Middle East and North Africa, and Sub-Saharan Africa.<sup>9</sup>

Female Education Helps Catalyze Economic Development



Girls who receive primary education tend to have lower maternal mortality, fewer children, and healthier families later in life.<sup>11</sup> In Asia, Africa, and Latin America, women with seven or more years of schooling have two to three fewer children than women with three or less years of schooling.<sup>12</sup> Smaller families lessen the economic burden upon women and release time and resources for parents to provide greater investment into the rearing and education of each child and more opportunities for women to enter the labor force (see **Labor**).

Implications for Business

Education enables people to get jobs, maintain family health, increase personal income, reduce unwanted pregnancies, protect their rights and civil liberties, and have greater choice in decisions that affect their lives. Countries in which the work force lacks basic skills are at a competitive disadvantage in the global marketplace, particularly as markets change from a production and manufacturing base to a knowledge and service base. Businesses have a direct stake in the educational systems in the communities in which they operate. Additional investment and resources are required to ensure that those entering the labor force will have the relevant skills to be productive workers in modern businesses. In order to marshal these investments and resources, new partnerships are needed between public and private sector organizations to ensure that people are educated for relevant and marketable skills.



# Innovation



## MORE VALUE WITH LESS IMPACT

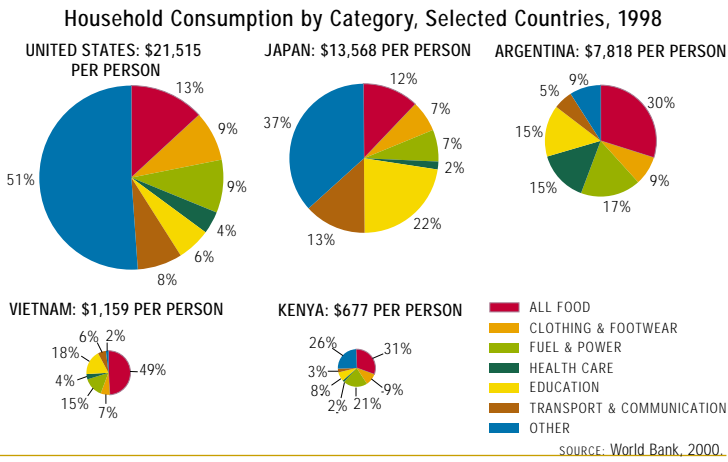
- Consumption
- Energy
- Emissions
- Efficiency

The rise in world affluence holds promise for better lives and also comes with significant risks to ecosystems if prevailing patterns of consumption, energy production, and waste persist. The need to reduce consumption and waste creates new opportunities for business to grow while at the same time helping people, economies, and ecosystems through the innovation of less wasteful processes, and life-enhancing goods and services.



Growing income has allowed people to expand their consumption of everything from meat and dairy products, computers, energy and paper to refrigerators, televisions, and automobiles. The greater consumption of food, housing, clean water, and transportation is essential to relieving poverty in many nations. However, the high consumption of the world's affluent consumers can have a negative impact on ecosystems disproportionate to their numbers. Today's model of intensive use of raw materials and resources undermines ecosystem function and runs the risk of overwhelming the planet's capacity to absorb wastes (see **Pollution**). Meeting the needs and desires of all people while preserving resources requires innovation of new technology and business models. Business can lower the resource intensity of the production of consumer goods, while improving their top and bottom lines and meeting consumer demand with sustainable products and services. Consumers themselves can drive change by favoring companies that produce goods and services that protect, conserve, and renew the environment (see **Ecosystems**).

Affluence Expands Choices For Consumption



People in high-income countries spend a much smaller percentage of their resources on the basic necessities of life, enabling them to purchase life-enhancing and luxury items with the remainder. As people in middle- and low-income countries become wealthier on average, they will have increased disposable income which will drive expanding markets for life-enhancing goods and services.

Facts

- The money spent on household consumption (all goods and services except real estate) worldwide increased 68% between 1980 and 1998.<sup>1</sup>
- Consumers in high-income countries spent \$15.4 trillion of the \$19.3 trillion in total private consumption in 1998. Purchases by consumers in low-income nations represented less than 4% of all private consumption.<sup>2</sup>
- Consumption of meat and milk in developing countries will grow between 2.8% and 3.3% per year respectively, from 1993 to 2020.<sup>3</sup>
- Television ownership increased five-fold in the East Asia and Pacific region from 1985-1997.<sup>4</sup>
- 200 million vehicles would be added to the global fleet if car ownership in China, India, and Indonesia were the same as the world average of 90 per 1,000; roughly double the number of automobiles today in the United States.<sup>5</sup>
- Paper consumption is rising fastest in the developing world, but the average American still consumes about 17 times more paper per year than the average citizen of the developing world.<sup>6</sup>

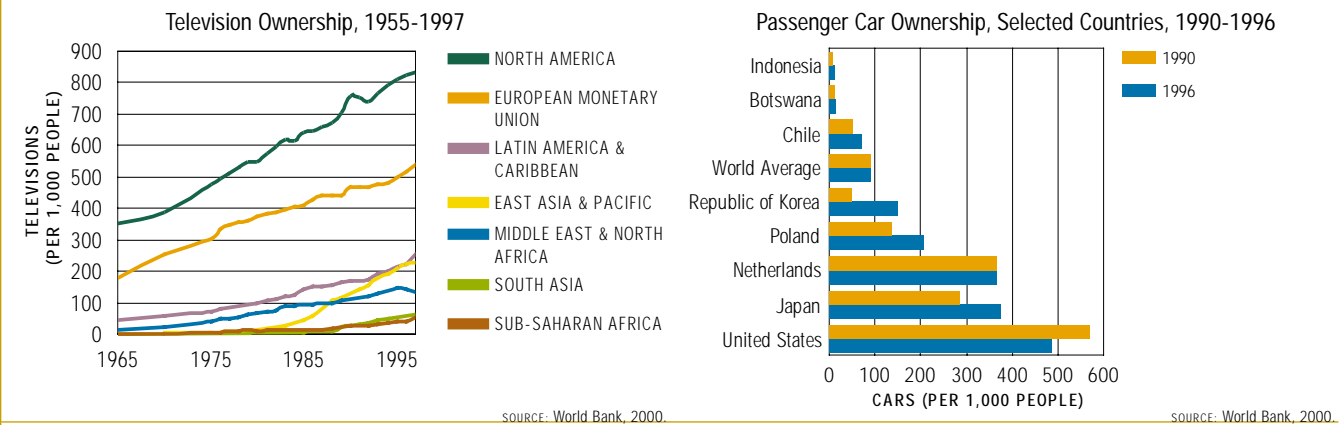


Rising consumption creates environmental risk and business opportunities for innovation.

The money spent on household consumption worldwide increased 68% between 1980 and 1998.

RELATED TRENDS	
Population	10
Efficiency	28
Mobility	42

How Do We Make Material Consumption Sustainable?

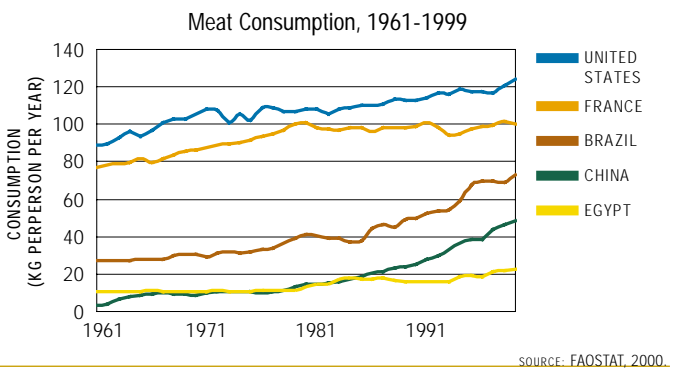


Television ownership has soared in many parts of the developing world, and TV is a gateway to entertainment and to political, public, and commercial information and knowledge. The world's newly affluent also aspire to greater mobility (see **Mobility**). As emerging economies

repeat the historical development patterns of the industrialized countries, rising car ownership and air travel will have major impacts on material consumption, land use, pollution, greenhouse gas emissions, and petroleum demand.



More Wealth, More Protein



Consumers in developing countries quickly add more protein to their diets as their incomes rise; per capita meat consumption has exploded in the fast expanding economies of China and Brazil. Meat consumption nearly tripled in Brazil and grew 13-fold in China since 1961, though consumption in both countries is still well below that in North America and Western Europe.<sup>7</sup> Protein-rich diets of meat and fish, however, demand large areas of land to produce animal feed, add pollution to waterways, can erode grazing lands, and lead to over-fishing (see **Agriculture**).

Implications for Business

The world population is poised to expand 50% by 2050 and with it will come an extraordinary growth in consumption. In the past, society has met demand by increasing our extraction and harvesting efficiency and by developing substitutes. Never has there been such an opportunity and imperative for innovation that meets the needs of many new consumers without damaging the planet's natural resource base. Far-sighted companies are making resources — energy, minerals, water, timber — stretch many times further through production efficiency, development of renewable and recyclable goods, and other changes that pay for themselves and help the environment. Some consumers in the developed world are favoring companies and products they perceive as socially and environmentally responsible. New ideas are emerging to reduce impacts of consumption, such as producing zero emission vehicles, changing annual crops to perennials, creating zero waste textile mills, and utilizing electronic paper and compostable footwear. It is this kind of “radical” or “discontinuous” invention rather than incremental improvement that is the source of significant — not incremental — improvements in competitive position and shareholder value.

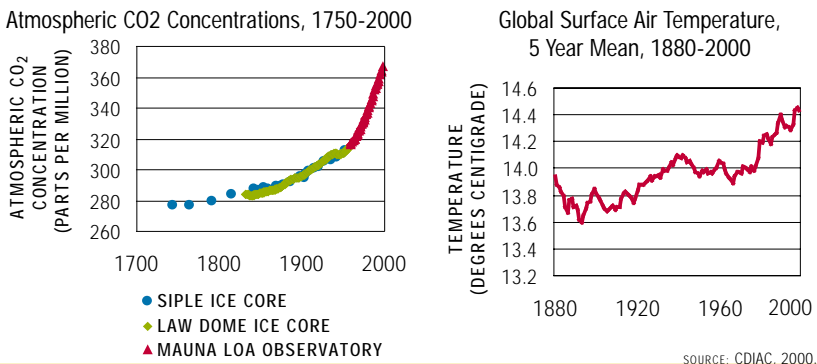
Since the Industrial Revolution, development and economic expansion have been tied to increased energy use. The link remains strong today — energy use is rising worldwide. Fossil fuels dominate the world's energy supply, yet the resulting greenhouse gas emissions are driving temperature changes and escalating the risks of climate change. Climate models predict that floods, droughts, and severe storms are likely to become both more frequent and more severe, costing lives, agricultural harvests, and economic progress.<sup>1</sup> The challenge for the energy sector is to supply electricity and services more efficiently and with less environmental impact. This challenge is especially great in the emerging economies, where energy needs are growing but disposable income and access to power grids are low. Currently, about two billion people live off the electrical generation and power grid.<sup>2</sup> This represents a huge market for dispersed energy systems such as photovoltaic generators, small wind turbines, hydrogen fuel cells, and biomass generators that meet rural power needs without the infrastructure of power grids, pipelines, and power plants. The market potential within the energy-hungry industrial economies for cleaner energy sources is seen in the rapid growth of wind, solar, and natural gas power.



Facts

- Biomass contributes approximately 15% of energy supply worldwide and accounts for one fifth to one third of energy consumption in developing countries.<sup>5</sup>
- The 1990s were the warmest decade and 1998 the warmest year on record.<sup>6</sup>
- Wind turbines now generate over 17,000 megawatts (MW) of electricity in more than 30 countries, making wind power the world's fastest growing source of energy.<sup>7</sup>
- Worldwide shipments of photovoltaic cells grew six-fold from 48 MW in 1990 to 288 MW in 2000; module prices (US\$ per Watt) declined from US\$30 to less than US\$5 from 1975 to 1995 and have remained constant as the market has grown 30% per year in recent years.<sup>8</sup>

A Warming World



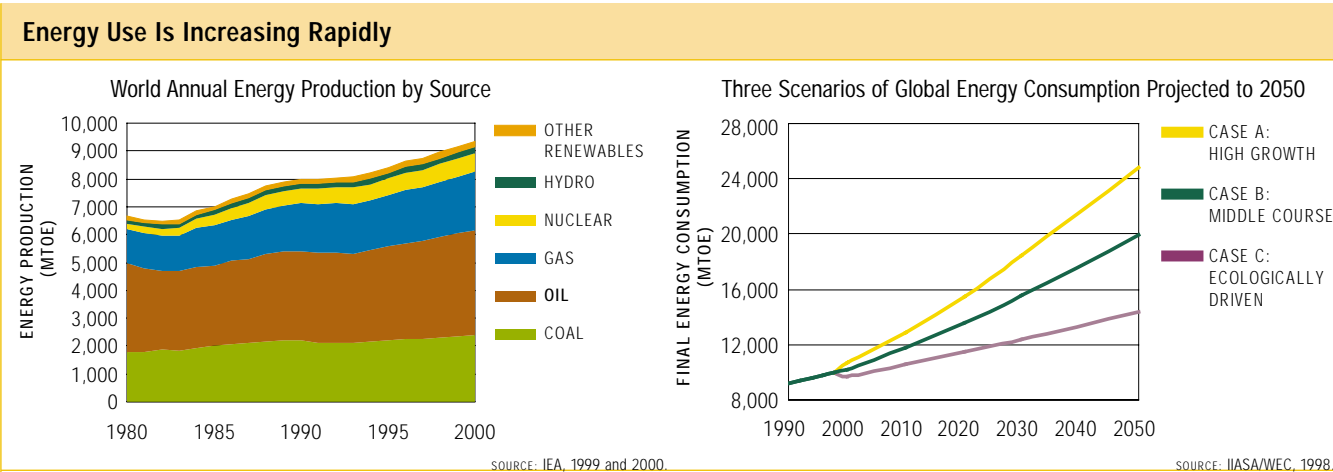
Burning fossil fuel causes air pollutants such as sulfur and nitrogen oxides, ozone, mercury, particulate matter, and carbon dioxide (see **Pollution**). Unlike many pollutants that are short-lived in the atmosphere, greenhouse gases such as CO<sub>2</sub> accumulate in the atmosphere. The CO<sub>2</sub> concentration in the atmosphere is now nearly 370 parts per million and rising fast, up from a pre-industrial level of 288 ppm. Scientists have confirmed that global warming is occurring and is human-induced — largely the result of greenhouse gas emissions from burning fossil fuels and deforestation.<sup>9</sup>

Escalating demand for energy propels economic development but threatens Earth's climate.

World energy production rose 42% between 1980 and 2000 and will grow 150-230% by 2050.

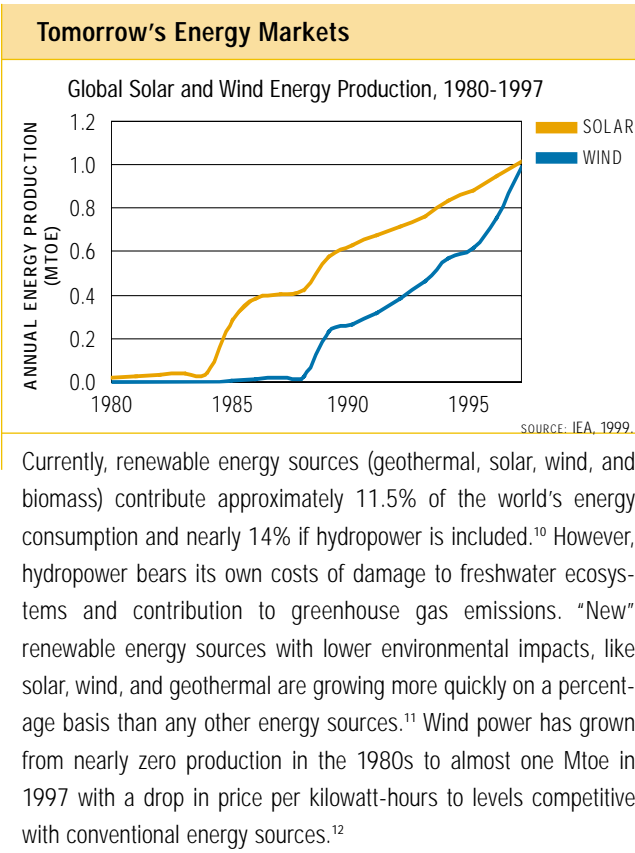


RELATED TRENDS	
Emissions	26
Ecosystems	32
Mobility	42



World energy production rose from 6,600 to 9,352 Mtoe (million tonnes of oil equivalent) — a 42% increase — between 1980 and 2000. Fossil fuels (oil, coal, and gas) account for almost all the growth and growth would have been even higher if not for energy efficiency gains made by some countries, such as China and the United States (see **Efficiency**).<sup>3</sup>

Across three economic growth and technological improvement scenarios, projected energy consumption increases between 1.5-2.3 times between 2000 and 2050.<sup>4</sup> The projected energy consumption varies by region, with particularly high rates of growth in the large emerging economies (see **Mobility**).



Currently, renewable energy sources (geothermal, solar, wind, and biomass) contribute approximately 11.5% of the world's energy consumption and nearly 14% if hydropower is included.<sup>10</sup> However, hydropower bears its own costs of damage to freshwater ecosystems and contribution to greenhouse gas emissions. "New" renewable energy sources with lower environmental impacts, like solar, wind, and geothermal are growing more quickly on a percentage basis than any other energy sources.<sup>11</sup> Wind power has grown from nearly zero production in the 1980s to almost one Mtoe in 1997 with a drop in price per kilowatt-hours to levels competitive with conventional energy sources.<sup>12</sup>

Implications for Business

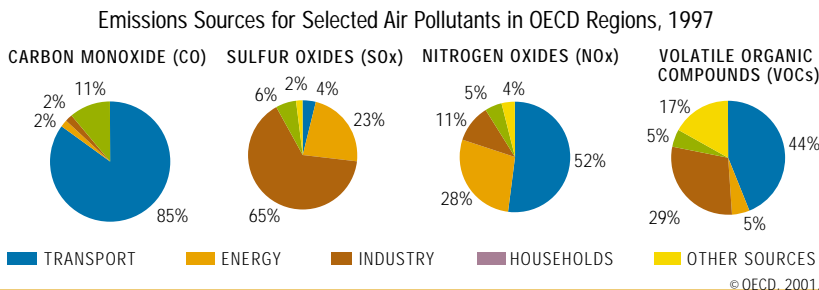
Energy use meets a basic human need, but the environmental impacts of rising energy production and consumption are introducing considerable uncertainty to industries — from oil and gas to reinsurance and agriculture. These uncertainties result from the costs and benefits of climate change mitigation markets as well as from the impacts of climate change. The price of fossil fuels may rise as the market internalizes environmental externalities. In response, proactive businesses are conducting inventories of their operations to reduce energy intensity and greenhouse gas emissions.<sup>13</sup> Some major multinational companies have made voluntary commitments to reduce greenhouse gas emissions and to support markets for trading carbon emission allowances and reduction credits.<sup>14</sup> These commitments are driving new markets in alternative energies, energy conservation services, and energy efficient technologies.



Waste and pollution including emissions from fossil fuel use, persistent chemical contaminants, and waste products of economic activities are, for the most part, increasing. Evidence from developed countries and the limited data from developing countries reveal a growing waste stream of rising emissions and pollution despite successes that demonstrate the cost effectiveness of pollution avoidance and reduction measures for certain pollutants (see **Energy**).<sup>1</sup> Climate change, acid deposition, species extinction, public health problems, and coastal dead-zones all point to waste accumulating at rates beyond Earth's absorptive capacity. Today's economies act as a linear system: materials and energy are taken from the natural environment, put to a brief useful life, and then become waste in the atmosphere, on land, or in water.

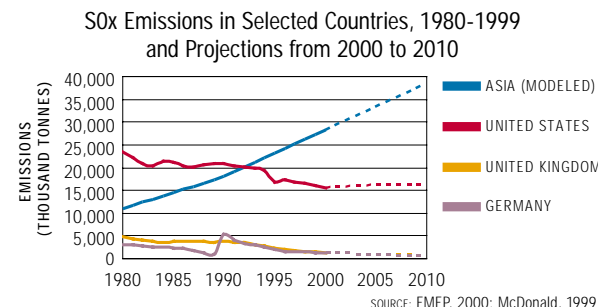


Transport And Industry Accounts For A Large Percentage Of Air Pollutants



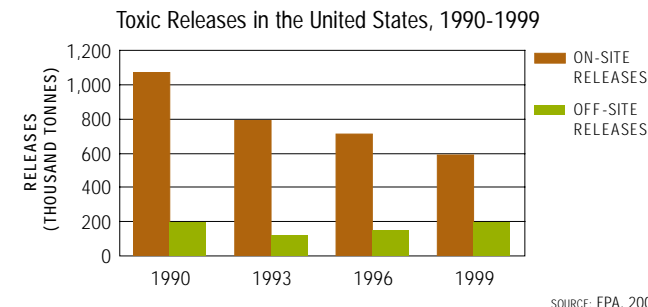
Pollution and waste are caused by all sectors of society but transportation (see **Mobility**), and the industrial and energy sectors play a large role in producing — and therefore can play a large role in avoiding — some forms of pollution. Fossil fuels power our economies; 50-90% of the mass of industrialized-country outputs into the environment goes up into the atmosphere (see **Consumption**).<sup>2</sup>

Air Pollution: Going Down And Going Up



Trends in pollution and emissions, such as sulfur oxide (SOx) emissions, often show two opposite directions in the developed vs. developing worlds. SOx pollution in many Western European nations has dropped by 75% or more since 1980, and decreased by about one quarter in the United States.<sup>8</sup> Asia's sulfur emissions (excluding the former Soviet Republics) are expected to rise from 18 to 48 million tonnes between 1990 and 2020 (see **Energy**).<sup>9</sup> Acid rain, from SOx and other acidifying emissions from fossil fuels, can severely impact agriculture and natural habitats.

Reporting And Accountability Mechanisms Can Work



Liability laws and the public reporting of toxic releases in the United States, and similar mechanisms in other OECD countries indicate that disclosure laws can lead to reductions in toxic releases. Toxic releases from industries tracked since 1987 by the United States Toxic Release Inventory (TRI) have dropped by nearly half (see **Accountability**). Toxic release data from industries newly followed since 1998 indicate that toxic releases are not uniformly decreasing and threaten to continue creating a dangerous and expensive toxic legacy.<sup>10</sup> The total cost to remediate contaminated sites in 13 OECD countries has been estimated to be about US\$330 billion.<sup>11</sup>



Pollution remains a global challenge.

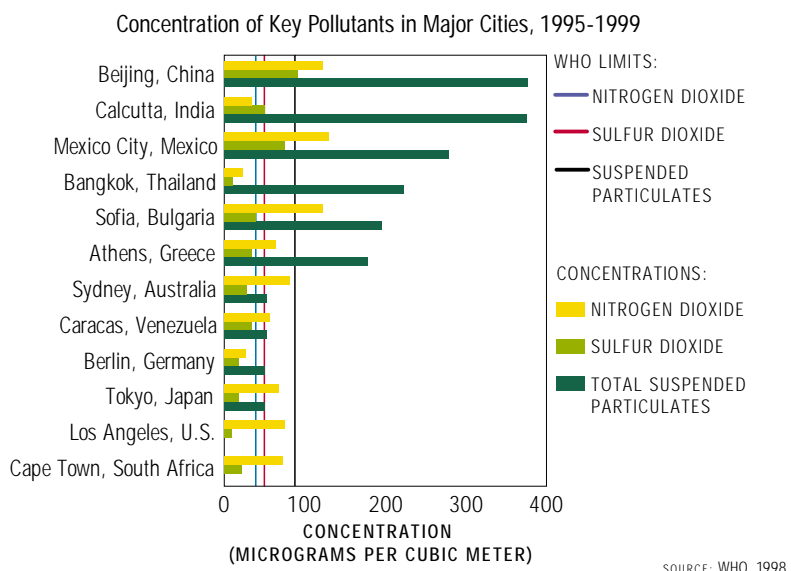
50-90% of the mass of industrialized-country environment outflows goes up into the atmosphere.

RELATED TRENDS	
Accountability	52
Urbanization	40
Health	16

Facts

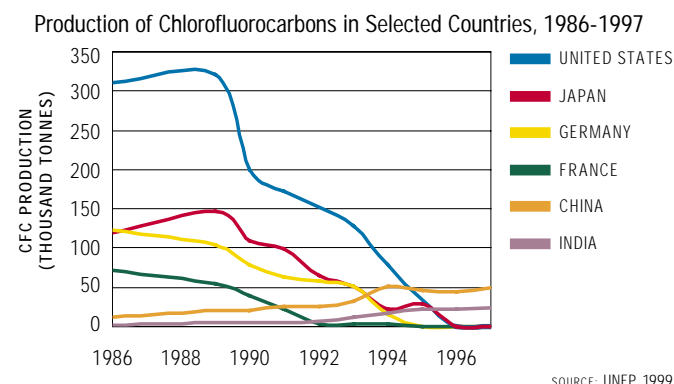
- In the early 1990s, 400 million tons of hazardous waste were produced annually, about 75% of this from OECD countries, mainly from chemical production, energy production, mining, pulp and paper industry, and leather industries.<sup>3</sup>
- Pollution abatement and control expenditures in the United States ranged from 1.7-1.8% of GDP from the mid-1970s to the mid-1990s and totaled US\$122 billion in 1994.<sup>4</sup>
- Estimates are that 2-6% percent of the total burden of disease in OECD countries is a result of environmental degradation — mainly from urban air quality problems, and chemicals in the environment.<sup>5</sup>
- Environment-related health costs in OECD countries is estimated to be between US\$50-\$130 billion.<sup>6</sup>

High Levels Of Pollution Endanger Human Health



Pollution takes a large toll on human and ecosystem health. In many cities, levels of SO<sub>2</sub>, NO<sub>2</sub>, and suspended particulates exceed healthy limits recommended by the World Health Organization (WHO). Air pollution, mostly from burning fossil fuels, causes an estimated 500,000 deaths each year and an estimated four to five million new cases of chronic bronchitis. The economic burden of this pollution is estimated at 0.5-2.5% of world GNP, about \$150-\$750 billion per year.<sup>7</sup>

The CFC Success Story



Concerted efforts to reduce industrial pollution have been successful when backed by industry and governments such as in the cases of SO<sub>2</sub> and chlorofluorocarbons (CFCs). The production of CFCs was reduced dramatically by most countries between 1986-1996.<sup>12</sup> Efforts to repeat this success with persistent organic pollutants (POPs) — associated with acute environmental toxicity, human reproductive disorders, birth defects, and cancer — are underway.<sup>13</sup>

Implications for Business

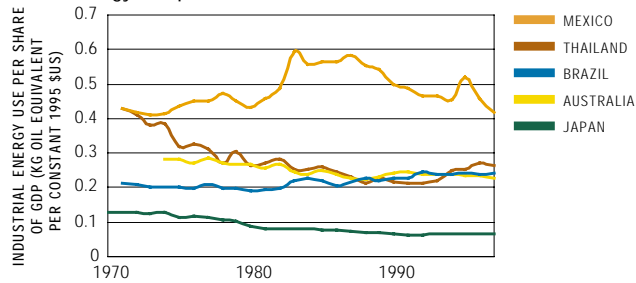
Polluting emissions of most types are rising worldwide and improvements in the developed world may be overshadowed by the waste from industrialization and consumption in the developing world. Waste and emissions represent lost value, business costs, and a threat to present and future human generations and to ecosystem health. Harmonization of business operations to a single high standard, international regulations, legal mechanisms for accountability, and civil society action are likely to further inflate the costs of waste management and to raise the risk of pollution-related financial and reputational liabilities. Innovation to avoid waste, use renewable resources, and develop industrial models in which wastes are captured and treated as an input into other processes can reduce costs and increase revenues. Examples of approaches that can reduce emissions and waste are renewable energy sources, transition from fossil fuel-based materials to raw materials from renewable and biodegradable sources, and industrial complexes that re-use waste heat, materials, and water.

Economic growth at both the company and national economy level has historically been linked to increased resource use and waste production, but many businesses and economies have recently demonstrated that improving efficiency can break this link. Greater efficiency is achieved via process improvements, waste and product recycling, less material-intensive product designs, remanufacturing, and other approaches, delivering benefits for competitiveness and the bottom line. Despite efficiency gains and unlinking economic growth from total material use, waste production is still rising across the globe. Developing nations tend to use less material and generate less waste per capita than more developed countries, yet employ materials less efficiently and, like developed countries, are increasing their total material use. Policy changes, economic gains from improved efficiency, consumer preference for eco-friendly products, and advocacy are all driving improvements in the efficiency of businesses and economies. Continued movement toward an efficient and sustainable economy will require a cyclical production model in which materials previously discarded as waste are captured and used as resources.



Industry Can Spearhead Efficiency Gains

Industrial Energy Use per Share of GDP in Selected Countries, 1970-1997



SOURCE: World Bank, 2001; IEA

Examples of Efficiency Gains in Selected Industries

INDUSTRY	YEARS	EFFICIENCY GAIN PER UNIT OUTPUT
European Union Chemical Industry	1985 to 1996	34% Less Energy
United States Chemical Industry	1974 to 1998	43% Less Energy
European Paper Industry	1975 to 1997	50-80% Less Water
European and Canadian Paper Industry	1990 to 1998	10.5% Less Energy
Steel Industry in 10 OECD Countries	1971 to 1991	20% Less Energy

SOURCE: OECD, 2001.

Industrial energy efficiency is improving in many countries around the world. The amount of energy needed by the industrial sector to generate income has fallen over time with specific industries making tremendous strides in improving efficiency. For example, the U.S. chemical industry

reduced energy consumption by 43% per unit of production since 1975, and the European paper industry shrank water usage by 50% to 80% per unit of production (see **Water**).<sup>8</sup>



Throughput still grows even as energy and materials efficiency improves.

Paper recycling into paper and fiber products has risen over the past three decades to about 40% of total paper production worldwide.

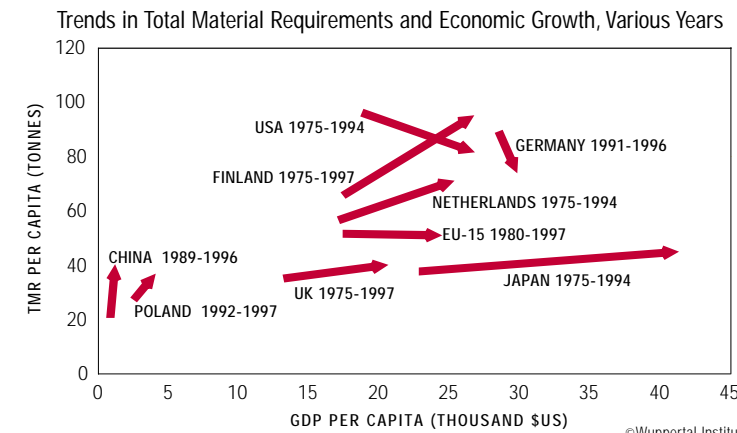
RELATED TRENDS

Energy	24
Water	36
Communications	44

Facts

- The United States recycles about 65% of its steel.<sup>1</sup>
- In 2000, European primary aluminum production was 3.8 million tonnes and recycled aluminum production was 2.25 million tonnes.<sup>2</sup>
- Paper recycling into paper and fiber products has risen over the past three decades to about 40% of total paper production worldwide.<sup>3</sup>
- In 1999, Brazil recycled 5.8 billion aluminum cans accounting for 73% of national can production and supporting a US\$55 million industry.<sup>4</sup>

Entire Economies Are Improving Efficiency

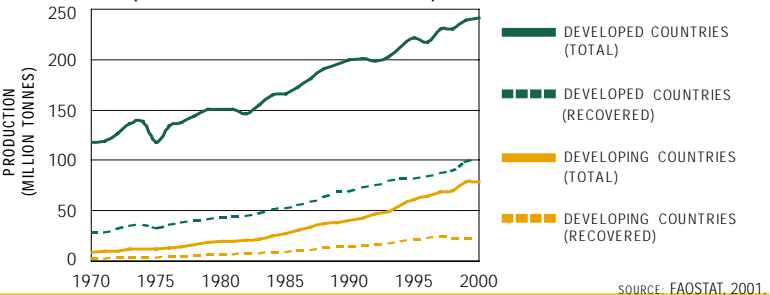


©Wuppertal Institute, 2001.

Total material throughput of a nation's economy can decrease even as GDP rises.<sup>5</sup> In the European Union (EU), per capita total material requirements (TMR: the sum of all imported and domestically produced material inputs into the economy) have remained stable between 1980 and 1996. However, the amount of value created with that material increased significantly: GDP of the EU grew 40% over the same time period. This trend is not universal; China's GDP per capita grew modestly from 1989 to 1996 while its total material requirement grew by well over 50%. Other countries, such as Finland or Poland where both GDP per capita and TMR grew rapidly from 1975 to 1997, saw little overall efficiency gain.<sup>6</sup> Between 1975-1996, the U.S. economy demonstrated decoupling between material use and economic growth, but the total burden on the environment, indicated by material outputs, still mounted.<sup>7</sup>

Promising Markets For Recycling And Efficient Products

Total Paper Production and Recovered Paper Production, 1970-2000



SOURCE: FAOSTAT, 2001.

Part of the observed decline in the waste intensity of economic activity is due to capturing materials for reuse.<sup>9</sup> Recycling of paper has kept pace or grown faster than paper production in the developed and developing worlds. The 40% of total worldwide paper production recovered for recycling into fiber-based products includes both consumer and production process wastes.<sup>10</sup> Efficiency gains over the life-cycle of product manufacturing are made from capturing waste materials and heat for reuse, sale, or trade. Consumer demand, activism, and regulations drive markets for energy efficient products. Light bulbs, washing machines, air conditioners, refrigerators, and other household appliances are being improved to provide the same services while using less energy. For example, reduced price, improved performance, electricity costs, and environmental awareness have propelled an almost 10-fold increase in the worldwide sales of compact fluorescent lamps (CFLs) in the last decade.<sup>11</sup> Other trends are less positive, such as the large investments in the development and marketing of sport utility vehicles in the United States and other countries (see **Consumption**).

Implications for Business

The last decade of growth in many countries has proven that value can rise while material and energy throughput decreases. But while overall industrial efficiency is improving, total materials throughput and waste generation continue to grow. Efficiency enhances competitiveness and reduces environmental liability. As efficiency is sought by businesses and imposed by regulations on both production and consumption, competitive advantage will accrue to those who serve the market demand for efficient products. Improving efficiency promises continued returns for industry; the transfer of eco-efficient technologies and practices to growing economies is both a growth market in itself and a means to earn license-to-operate in new markets. Successful companies in this century will focus on production processes and business models that recycle raw materials, process outputs and finished products through the value chain and the product life cycle.



# Natural Capital



## PRESERVING THE RESOURCE BASE

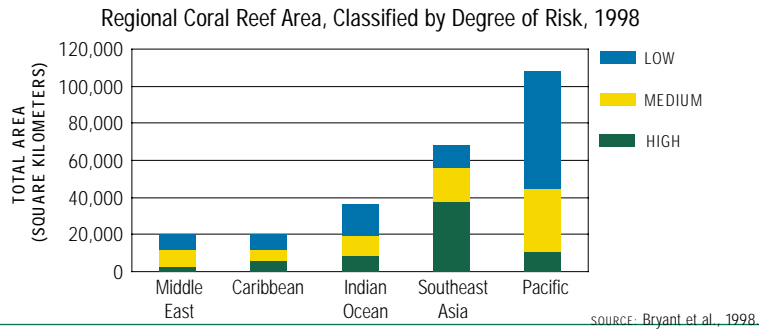
- Ecosystem
- Agriculture
- Freshwater

The world economy depends on a base of natural resources — our “natural capital” — that is showing signs of severe degradation. Without improved environmental performance, future business operations will be exposed to risks of rising prices for water, materials, and for waste disposal. Those businesses that reduce the environmental impacts of their operations, goods, and services will win competitive advantages. Protecting the long-term license-to-operate in existing and new markets depends on business strategies that preserve and renew natural habitats and critical environmental resources.



Ecosystems — communities of species that interact with each other and the physical settings in which they live — represent capital in the portfolio of natural assets that yields our livelihoods and supports our well-being. Ecosystems such as grasslands, forests, coastal areas, and rivers supply food, water, air, biodiversity, climate stability, provide places for aesthetic enjoyment and recreation, and process our wastes. They provide jobs and income: in the 1990s, agriculture, forestry, and fishing accounted for approximately four of every ten jobs worldwide, five of ten jobs in East Asian and Pacific countries, and six of ten jobs in Sub-Saharan Africa.<sup>1</sup> In a quarter of the world's nations, crops, timber, and fish still contribute more to the economy than industrial goods. Declining agricultural productivity, diminished supplies of freshwater, reduced timber yields, and declining fish harvests have taken a significant toll on many local economies.

Coral Reef Destruction Undermines Coastal Economies

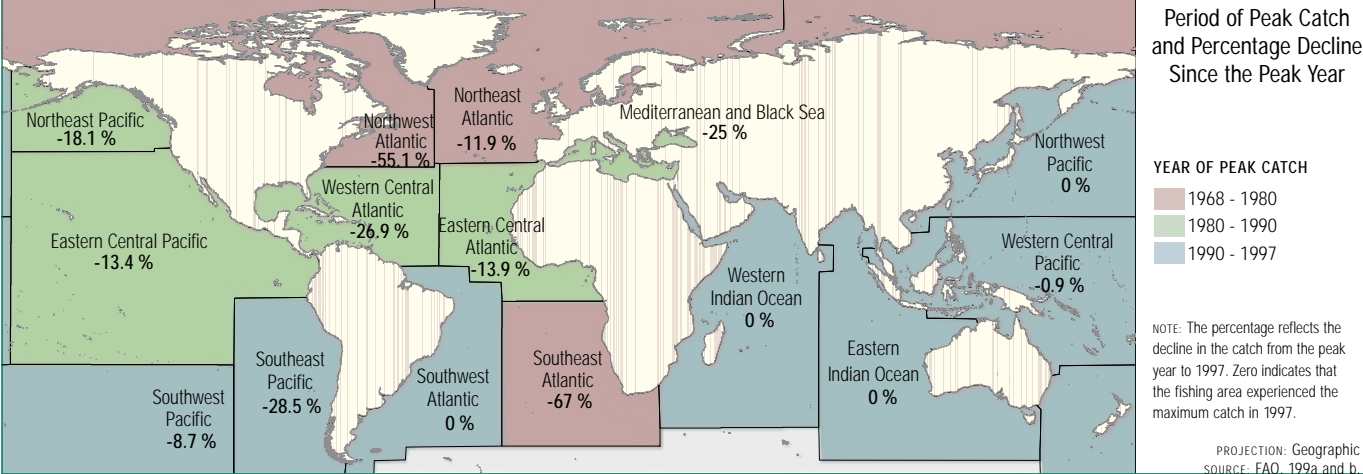


Approximately 150,000 square kilometers of coral reefs worldwide are at medium to high levels of risk of degradation; the threat is greatest in Southeast Asia and the Pacific regions. Direct human activities such as over-fishing, destructive fishing, and pollution and sedimentation from human settlement, deforestation, industry, and agriculture are the greatest immediate threats.<sup>2</sup> “Coral bleaching” is a common coral killer and may be one of the first clear impacts of climate change on biodiversity.<sup>3</sup> Degradation of coral ecosystems and the resulting loss of fish habitat and the decline in tourism jeopardize the livelihoods of some coastal communities and tourism-dependent island nations.<sup>4</sup>



The productive capacity of the planet is in decline.

Are Fleets Exploiting Marine Resources Past The Point Of Recovery?



Fisheries are a major international industry: total fisheries catch in 1997 was valued at US\$81 billion.<sup>16</sup> However, marine fisheries are showing signs of strain from over-exploitation. The last 20 years have seen great geographic expansion by industrial fleets, intensified fishing, and improved

technology but total fisheries catch has remained relatively constant since the mid-1980s.<sup>17</sup> Larger fishing fleets have had to continuously move to less-exploited fish species and less-exploited regions as they progressively harvest areas beyond their capacity to recover (see **Agriculture**).

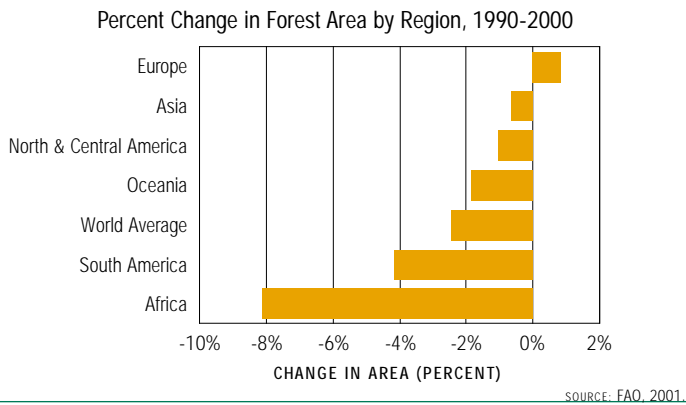
Nearly 26,000 plant species, more than 1,100 mammals and 1,200 birds, 700 freshwater fish, and hundreds of reptiles and amphibians are threatened with extinction.

RELATED TRENDS	
Energy	24
Population	10
Emissions	26

Facts

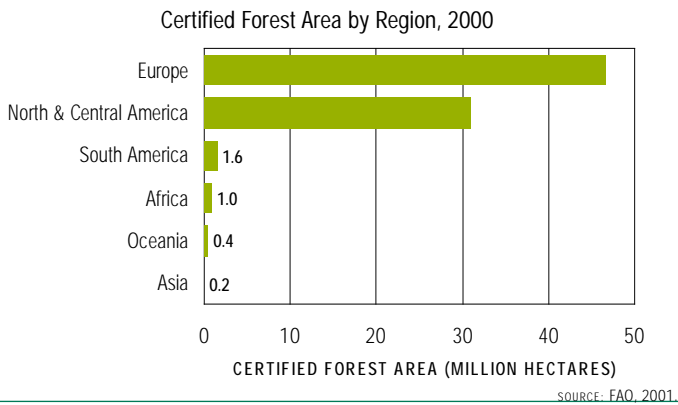
- Nearly 26,000 plant species — about 10% of all known plant species — are under threat of extinction.<sup>5</sup> More than 1,100 mammals and 1,200 birds, 700 freshwater fish, and hundreds of reptiles and amphibians are also threatened with extinction.<sup>6</sup>
- Invasive species are a worldwide problem, e.g., non-native trees in South Africa's Western Cape use more water than native species and threaten to cut Cape Town's water supply by about one third in the next century.<sup>7</sup>
- The United States has lost an estimated 53% of its wetlands.<sup>8</sup> Current repair of the natural functions of the Florida Everglades to restore habitat, water provision, and flood control is estimated to cost US\$7.8 billion.<sup>9</sup>
- In 1997, the global market for natural-product derived pharmaceuticals was estimated at US\$75-\$120 billion.<sup>10</sup>
- Human-induced evolution (acquisition of resistance) in some major pests and pathogens approaches a US\$50 billion cost to the United States economy and probably exceeds US\$100 billion.<sup>11</sup>

Forest Loss Impacts Clean Water, Biodiversity, And Climate



Between 1990 and 2000, Africa and South America — the regions of some of the world's largest surviving tropical forests — lost 8% and 4% of their total forests, respectively.<sup>12</sup> The world lost a net average of 2% of its forests during that decade.<sup>13</sup> These percentages represent huge areas: 16.1 million hectares of forest were lost per year to deforestation and conversion to plantations during the 1990s, 94% of this in the tropics.<sup>14</sup> Forests act as water reservoirs and filters, provide home and livelihoods for human populations, and play an important stabilizing role for Earth's climate (see **Freshwater**). Approximately 35–40% of Earth's carbon is stored in forests, and land use change (principally deforestation) releases roughly 20% of all annual carbon emissions.<sup>15</sup>

Ecosystem Stewardship Creates New Market Opportunities



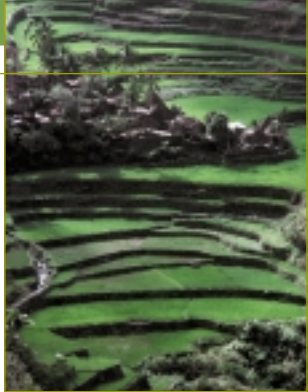
Regulatory pressures, social activism, and consumer preferences are driving producers and retailers to offer a range of products — timber, coffee, fruits and vegetables, wine and others — that are certified as produced in an environmentally and/or socially responsible manner (see **Agriculture**). About 2% of forests worldwide are certified as managed for sustainable yield and for provision of wildlife habitat, clean water, biodiversity, and other ecological services.<sup>18</sup> While the percentage of the total markets filled by certified products is now small, growth rates are very high.

Implications for Business

The private sector has an interest — and an economic opportunity — in managing the natural capital portfolio wisely. Many of the goods and services supplied by ecosystems cannot be replaced at any reasonable price. There is a growing interest in treating ecosystem goods and services not as “free” common goods, but as assets with a market value in order to provide incentive for their conservation. Economies are developing for the goods and services that ecosystems supply through creation of new property rights, markets for CO<sub>2</sub> emissions credits, markets for sustainable agriculture products, water pricing schemes, and other incentive systems. As these markets emerge, competitive advantage will go to businesses that can reduce environmental impacts, embody environmental performance in consumer products, innovate services that protect and renew the environment, and that reduce the costs and liabilities associated with ecosystem damage.



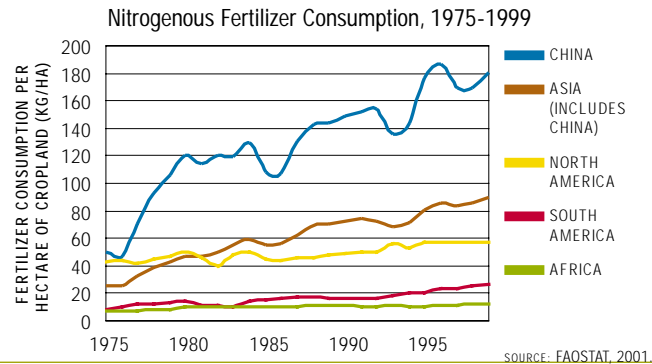
How we choose to produce food may determine the future of grasslands, forests, marine ecosystems, and other ecosystems. Keeping pace with population growth and alleviating existing malnutrition over the next decades will require greater food production with less environmental impact (see **Nutrition**). There are many warning signs that the agricultural system is under stress. Soil erosion, reductions in rates of cereal yield gains, plunging fish stocks, and contamination of waterways are widespread problems. Land clearing for agricultural production to support grain and animal protein demand has degraded or destroyed forests and grasslands. The world harvest of grains, livestock, and fish employs more water, labor, and land than any other human activity, making ecologically effective food production one of the primary goals of both economic and human development.



Facts

- About 30% of the potential area of temperate, subtropical, and tropical forests and about 40% of temperate grasslands (grasslands, savannas, and shrublands) have been converted to agriculture.<sup>1</sup>
- Cropland and managed pastures cover approximately 28% of planetary land surface, of which 31% is crops and 69% is pasture.<sup>2</sup>
- In 1997, food production was valued at about US\$1.3 trillion per year and employed about 1.3 billion people.<sup>3</sup>
- Dams built for irrigation and energy generation fragment rivers and destroy wetland and aquatic habitats. There were 5,750 large dams (>15 meters high) in 1950; today there are over 45,000.<sup>4</sup>
- World consumption of meat has more than tripled in the past four decades, outpacing population growth and exceeding 225 million metric tons per year; 37% of all grain consumption is for animal feed.<sup>5</sup>

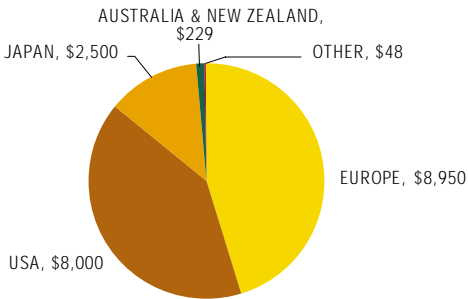
Reliance On Inputs Is Rising



Nitrogen fertilizers and irrigation are being used more and more to raise and maintain crop yields as farmers gain access to advanced production inputs (see **Freshwater**). This is particularly apparent in the fast growth and high rates of fertilizer use in China. Stagnant yields in Africa are partly due to the many African farmers who do not have access to or cannot afford effective irrigation and fertilizer. However, water drainage from high application rates of nitrogen fertilizers can lead to dead zones in rivers, lakes, and coasts.

Concerned Consumers Create Hot Markets

Organic Retail Sales, Forecast for 2000 (\$US Millions)



Certification standards are spreading worldwide for “organic” food — food produced without chemical inputs and to various standards of ecosystem stewardship. Today’s worldwide retail market of US\$20 billion for organic-certified products is growing approximately 10% to 30% annually in the industrial nations.<sup>8</sup> More than 130 countries produce certified organic food in commercial quantities including at least 65 developing countries.<sup>9</sup>

Food production is the basis of many economies but threatens the ecosystems upon which it depends.

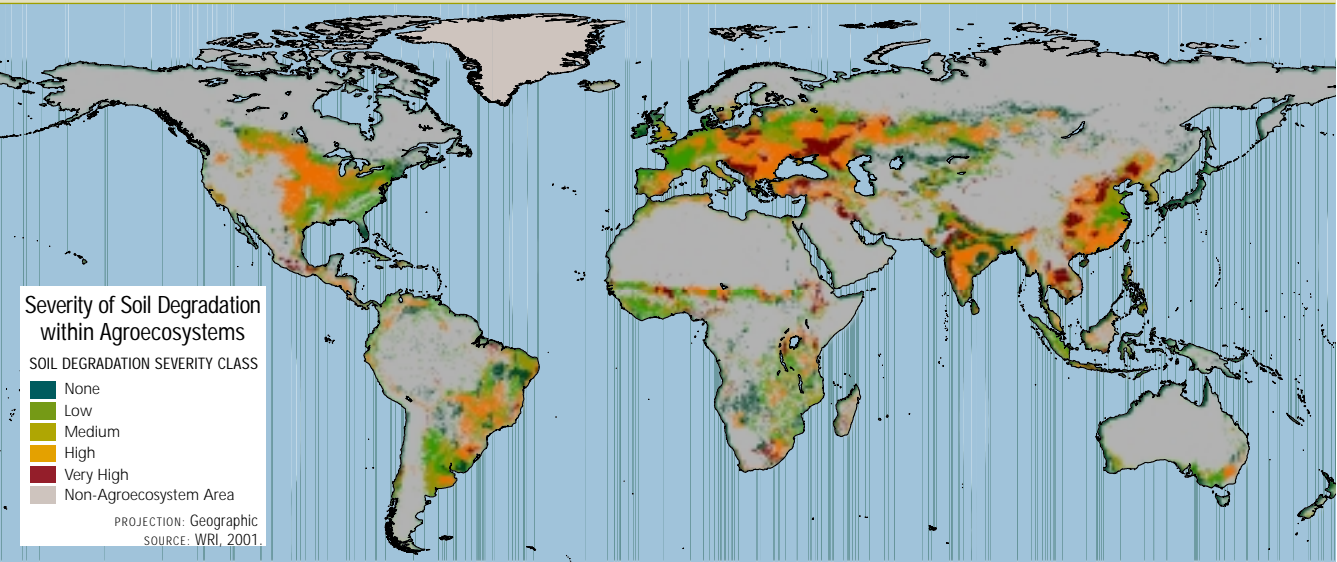


About 30% of the potential area of temperate, subtropical, and tropical forests and about 40% of temperate grasslands have been converted to agriculture.

RELATED TRENDS

Nutrition	14
Health	16
Consumption	22

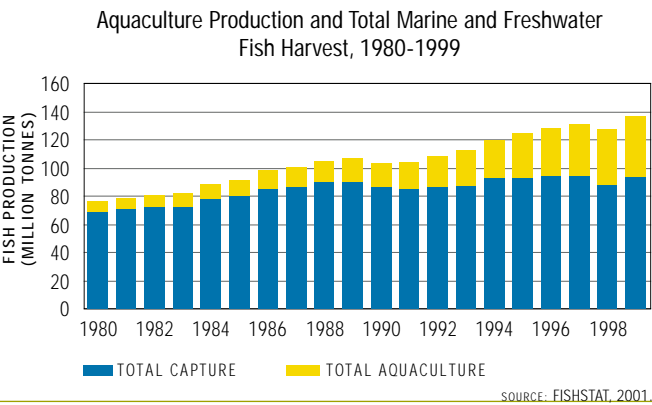
Sustainable Agriculture Depends On Soil Quality



Agriculture is a primary source of employment and income for many developing countries and generates over one third of GDP in many low-income countries.<sup>6</sup> Agricultural crops can be very valuable, particularly in densely settled areas in China, Southeast Asia, and Europe, but also in parts of Africa and South America where export crops are grown. Half or more of the labor force in East, South and Southeast Asia, and Sub-Saharan Africa is directly involved in agriculture (see **Labor**).

Healthy soils are vital to high levels of agricultural value but large areas of productive land have been degraded by human mismanagement and climatic effects. Degradation of agricultural land (such as erosion, salinization, water-logging, nutrient depletion, acidification, and pollution) endangers food production and livelihoods. Worldwide, more than 40% of agricultural land is moderately degraded, 9% is strongly degraded and degradation has reduced worldwide crop productivity by approximately 13%.<sup>7</sup>

Farmed Fish Becomes Big Business



Rising demand and declining productivity of marine and freshwater ecosystems have driven the modernization and fast growth of aquaculture (see **Ecosystems**). Farmed fish and shellfish production has grown in volume more than tenfold since 1970, rising from 3.5 million to 42.8 million metric tons and in value from US\$12 billion in 1984 to US\$53.5 billion in 1999.<sup>10</sup> Aquaculture solves some problems of over-fishing but can create high environmental costs in coastal land use, water pollution, and use of ocean-caught fish in fish feeds.

Implications for Business

The success of the past half century at meeting world food needs has been matched by the continued degradation of the productive capacity of natural systems. The concept of sustainability has been described as living off of the interest of natural capital without harming the principal. The greatest threats to ecosystems are the conversion of land and water habitats for agricultural uses or their destruction by over-harvesting; how we produce human food, animal feed, and fiber will largely determine the preservation of biodiversity and ecosystems. The private sector plays an important role by supporting agricultural research, transferring knowledge, products, and agricultural practices with which farmers can conserve and protect resources such as water, soil, and plant and animal species. New approaches — from organic farming, to fish-farming, to genetic engineering — are transforming how we produce and conceive of food and also impact our capacity to protect and restore vital natural resources.

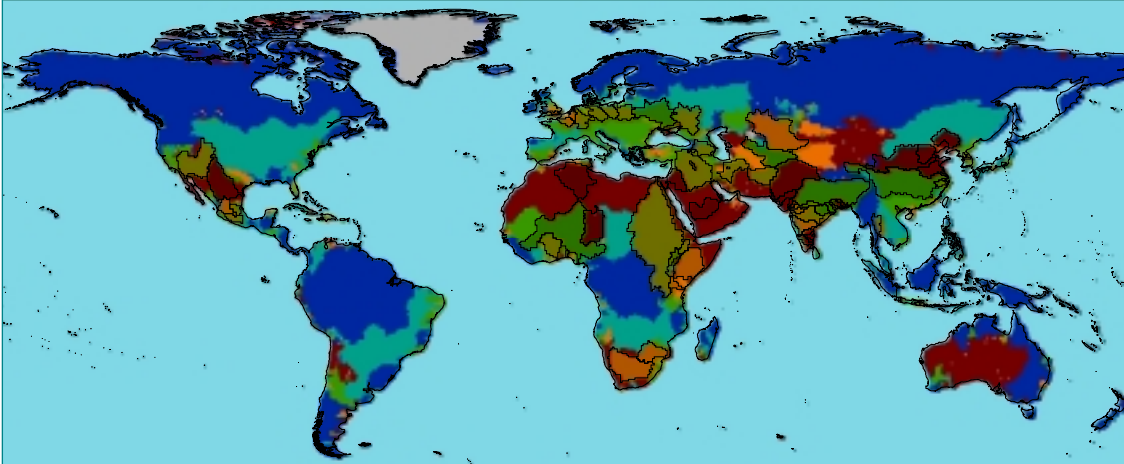


Water availability is arguably the world's most pressing resource issue. Water is essential for all living things, has shaped human societies for millennia, and is the basis of business activities such as cooling, food processing, chemical synthesis, and irrigation. Growing water scarcity and alarming declines in aquatic biodiversity are evidence that water policies and practices in most parts of the world are failing to protect life's most vital resource. Population growth, industrialization, urbanization, agricultural intensification, and water-intensive lifestyles are placing great stress on freshwater systems, with both water use and pollution driving the scarcity of useable water. Surfacewater quality has improved in most developed countries during the past 20 years, though nitrate and pesticide contamination remain persistent problems. Data on water quality in other regions of the world are sparse, but water quality appears to be compromised in almost all regions and continues to decline in areas with intense agricultural development and rapid urbanization.

Facts

- Over the past century, world water withdrawals increased almost twice as fast as population growth.<sup>1</sup>
- More than 20% of the world's 10,000 recorded freshwater fish species have become extinct, threatened, or endangered in recent decades.<sup>2</sup> Factors contributing to freshwater fish extinction include habitat alterations (71%), non-native species (54%), overfishing (29%) and pollution (26%).<sup>3</sup>
- In 60% of the European cities with more than 100,000 people, groundwater is being used at a faster rate than it can be replenished.<sup>4</sup> Cities that have experienced aquifer drops between 10 to 50 meters include Mexico City, Bangkok, Manila, Beijing, Madras and Shanghai.<sup>5</sup>
- Water pricing is a clear trend in developed countries; 17 of 18 OECD countries surveyed showed annual increases in household water prices in the 1990s.<sup>6</sup>

40% Of The World Will Live In Water-Scarce Regions By 2025



Projected Renewable Water Supply per Person by River Basin, 2025

ANNUAL RENEWABLE WATER SUPPLY (M<sup>3</sup>/PERSON/YEAR)  
<500  
500 - 1,000  
1,000 - 1,700  
1,700 - 4,000  
4,000 - 10,000  
>10,000  
No data  
NOTE: Outlined basins are projected to have a population of more than 10 million people in 2025 and to be in or approaching water scarcity.

PROJECTION: Geographic SOURCE: CIESIN, 2000; Fekete et al., 1999.

Large areas of the world experience "water stress," defined as below 1,700 cubic meters per year per person.<sup>10</sup> In areas where supplies drop below 1,000 cubic meters per person, shortages disrupt both food production and economic development unless the region is wealthy enough to apply new technologies for water conservation and re-use. An estimated

2.3 billion people, 41% of the world's population, currently live in water-stressed areas. By 2025, 3.5 billion are projected to live in water-stressed areas.<sup>11</sup> Water scarcity has also led to conflict between upstream and downstream areas within countries, and tense relations between countries sharing a transnational waterway or watershed.<sup>12</sup>



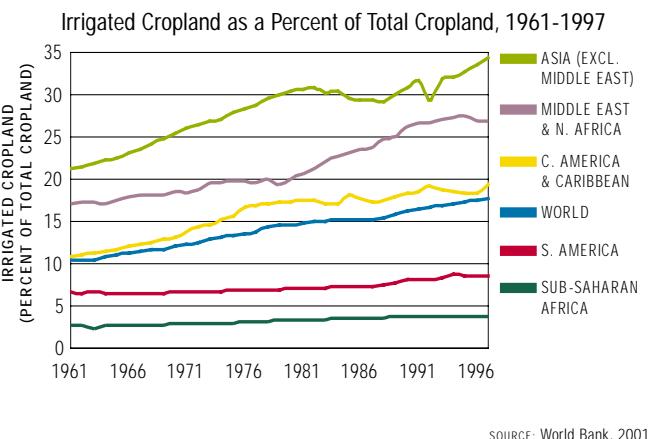
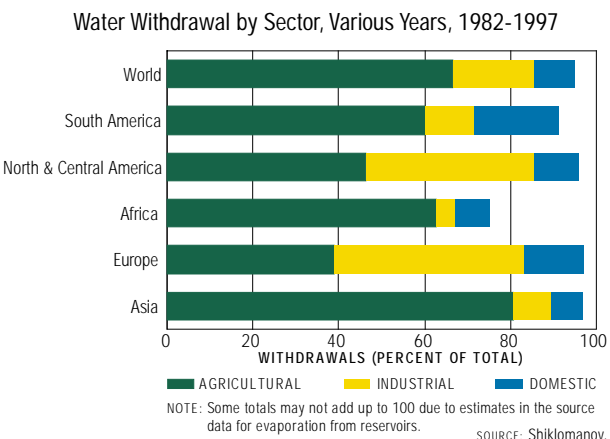
Freshwater is growing scarce amidst competing human needs.

Over the past century, world water withdrawals increased almost twice as fast as population growth.

RELATED TRENDS

Health	16
Efficiency	28
Privatization	54

Thirsty Crops Dominate World Water Withdrawal

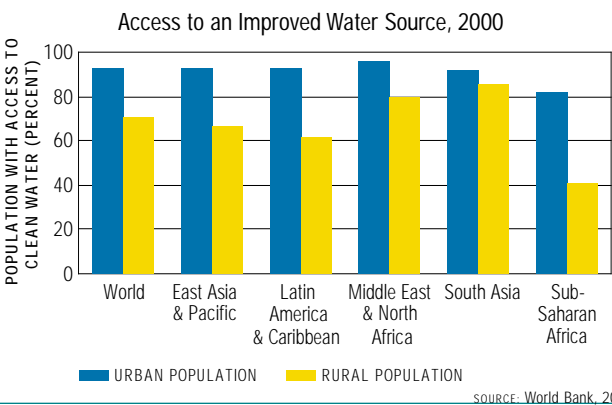


Seventy percent of all freshwater withdrawal is for agriculture.<sup>7</sup> Inefficiency abounds in water usage and exacerbates scarcity problems; over half of the water withdrawn for irrigation never reaches the target crop because of leakage and evaporation.<sup>8</sup> Overuse of agricultural inputs

such as chemical fertilizers, pesticides, and manure contaminates water supplies with nutrients like nitrates, phosphorus, and heavy metals that can cause significant problems for water quality (see Agriculture).<sup>9</sup>



Access To Safe Water Improves But Still Eludes Many



Over one billion people worldwide, most in rural areas, lack access to a safe water source and more than 2.5 billion people do not have access to adequate sanitation facilities.<sup>13</sup> Unclean water and poor hygiene take an enormous toll on the health of populations through preventable disease; there are approximately 1.5 billion cases annually of diarrhea in children under the age of 5, resulting in 3.3 million deaths (see Health).<sup>14</sup> Trachoma, a water-borne bacteria, caused blindness in 6 million people, and water-borne parasites led to 700 million cases of hookworm and 1.3 billion cases of roundworm.<sup>15</sup>

Implications for Business

The pressures on freshwater supplies portend rising water costs and an urgent need to improve water-use efficiency. Short water supplies will make it difficult for water-intensive businesses to site their activities in arid regions and will increase water-related costs everywhere. Raising prices for water usage can send signals to consumers that conservation is good for the environment as well as to investors to attract funding for essential water infrastructure. True cost recovery for water is made difficult by subsidies that include public investment in irrigation projects, irrigation water pricing, urban and industrial infrastructure, and uncompensated environmental damage from water over-use and pollution. Increases in industrial water efficiency as well as private sector involvement in water management hold promise; reduction of water use, closed-loop systems, and elimination of water discharges can lower water costs, energy costs for pumping and cooling, and wastewater treatment costs. Water scarcity may create a new arena for business differentiation — those with water-efficient processes or products may have greater operational flexibility and more competitive cost structures in a water-stressed world.



# Connections



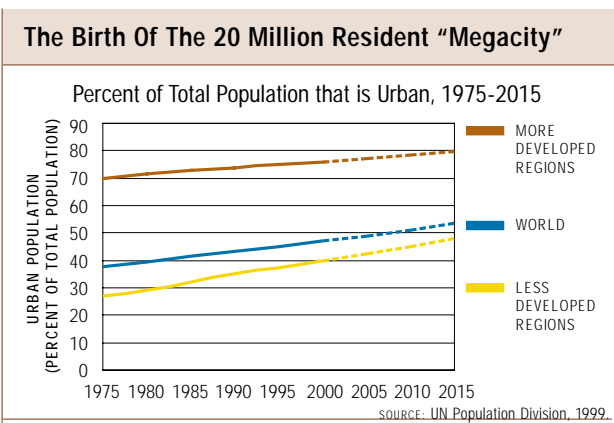
## DOING BUSINESS IN A NETWORKED WORLD

- Urbanization
- Mobility
- Communications
- Labor

We live in a world of rapid change and a growing density of human and technological networks. People are concentrating in cities with greater access to information and transportation networks. Information and knowledge propagate at light speed, and people and goods move around the globe as never before. In this integrated world, businesses have a crucial stake in economic development, healthy cities, efficient and accessible mobility, and in expanding the pool of educated workers and consumers.



There is a steady growth of urban areas worldwide — the result of population growth within cities, rural-to-urban migration, rural ecological degradation, a workforce shift from agriculture to industry, public investment in cities rather than rural areas, and political change. People are attracted from rural areas to cities in search of jobs and greater access to education, healthcare, transportation, and markets. Numerous large cities have grown into “megacities” — metropolitan areas of more than 10 million people — though small and medium-size cities remain home to the majority of urban dwellers.<sup>1</sup> The current pace and scale of urban growth strains the capacity of many local and national governments to provide basic services to residents. With suitable development strategies and investment in infrastructure, urban areas in the developing world can become important and readily accessible markets; they also typically offer the private sector access to a better-educated, healthier workforce than rural areas. However, without significant investments in infrastructure, cities can become incubators for smog, crime, polluted water, disease, and slums that all jeopardize human health, productivity, and the natural resource base.



The growth in the number of megacities has been particularly striking in the past several decades. In 1950, only New York had over 10 million residents and London, Paris, Moscow, Essen, Buenos Aires and Chicago were among the ten largest cities. Today there are 19 cities of over 10 million residents; in 2015 the number is expected to be 23 and some will soon exceed 20 million people. Many of the largest cities are now in Asian, African, and Latin American developing countries.<sup>2</sup>

**The World's Largest Cities**

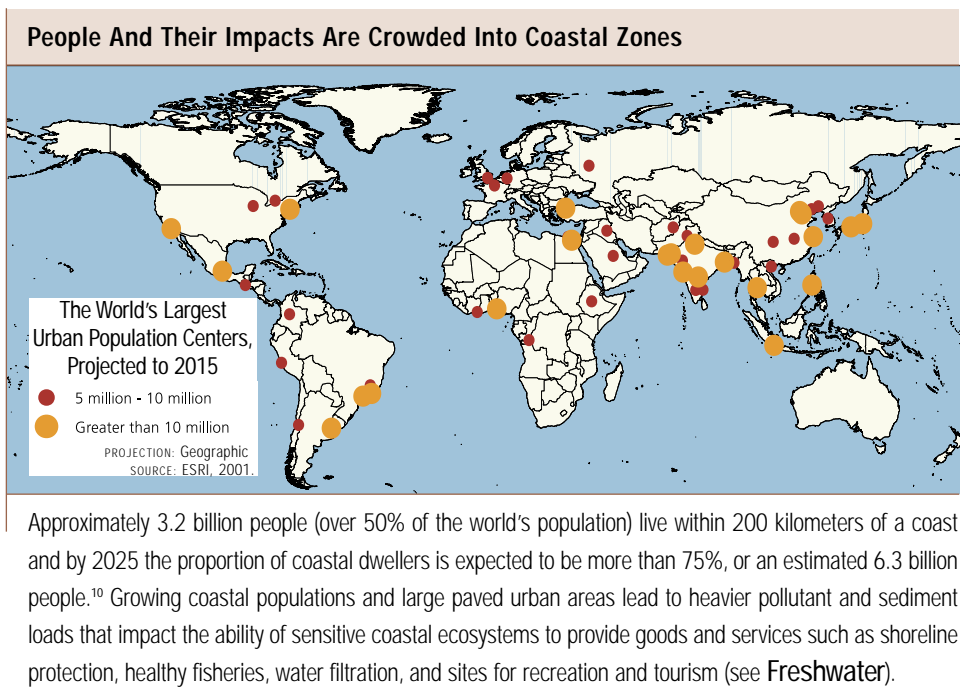
Present and Future

2000	CITY	POP. (millions)
1	Tokyo, Japan	26.4
2	Mexico City, Mexico	18.1
3	Bombay, India	18.1
4	São Paulo, Brazil	17.8
5	New York, U.S.A.	16.6
6	Lagos, Nigeria	13.4
7	Los Angeles, U.S.A.	13.1
8	Calcutta, India	12.9
9	Shanghai, China	12.9
10	Buenos Aires, Argentina	12.6
TOTAL NUMBER OF MEGACITIES:		19

2015	CITY	POP. (millions)
1	Tokyo, Japan	26.4
2	Bombay, India	26.1
3	Lagos, Nigeria	23.2
4	Dhaka, Bangladesh	21.1
5	São Paulo, Brazil	20.4
6	Karachi, Pakistan	19.2
7	Mexico City, Mexico	19.2
8	New York, U.S.A.	17.4
9	Jakarta, Indonesia	17.3
10	Calcutta, India	17.3
TOTAL NUMBER OF MEGACITIES:		23

SOURCE: UN Population Division, 1999.



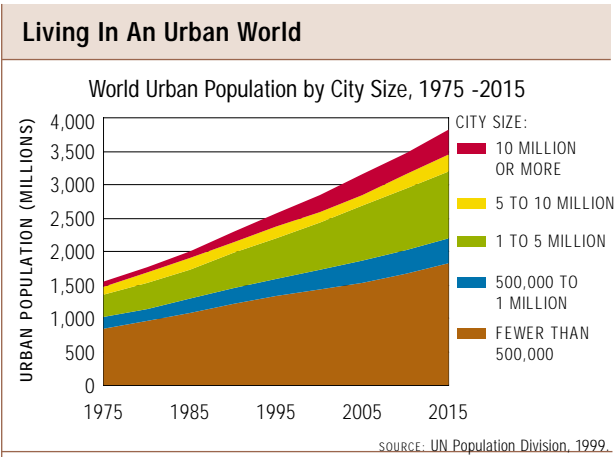
Urban growth concentrates business opportunities and societal challenges.

The current addition of 60 million new urban citizens a year is the equivalent of adding the urban population of Paris, Beijing, or Cairo every other month.

RELATED TRENDS	
Health	16
Water	36
Privatization	54

Facts

- By 2010, more than 50% of all people will live in urban areas. In developing countries, the proportion of urban dwellers will rise from less than 20% in 1950 to more than 40% in 2010.<sup>3</sup>
- Of the world's fastest growing cities with population greater than 750,000, 2% are located in high-income countries, 40% are in middle-income countries, and 60% are in low-income countries. Asia is home to 60% of these cities, Africa to 25%, and Latin America to 15%.<sup>4</sup>
- The current addition of 60 million new urban citizens a year is the equivalent of adding another Paris, Beijing, or Cairo every other month.<sup>5</sup>
- The health consequences of urban air pollution are high; each year, suspended particulate matter may account for 460,000 premature deaths, and SO<sub>2</sub> for 370,000 premature deaths.<sup>6</sup>
- Developing-nation cities often lack adequate solid waste disposal; in Northern African cities, 20-80% of solid waste is disposed of by open dumping.<sup>7</sup>
- Projections of municipal solid waste in Asia predict a rise from 2.7 million cubic meters (m<sup>3</sup>) per day in 1999 to 5.2 million m<sup>3</sup> per day in 2025; solid waste management costs Asian cities US\$25 billion per year.<sup>8</sup>



Urban growth started long ago in the developed world where about 76% of people now live in urban areas. The proportion of urban dwellers in the developing world is much lower but the growth rate in the past two decades has been very rapid (see [Wealth](#)). The fastest urban growth has occurred in many intermediate-size cities with populations of 1 million to 5 million which grew in number by 80% in the last 20 years.<sup>9</sup> These cities are as diverse as Phoenix, United States (2.6 million), Shenzhen, China (1.1 million), and Guatemala City, Guatemala (3.2 million). Many countries direct their resources to their largest urban centers, leaving smaller cities and rural areas neglected in terms of infrastructure and services.

**Rural Neglect Makes Cities Attractive**

Comparison of Urban-Rural Statistics, Selected Countries, 1996-2000

	INDIA		VIETNAM		TANZANIA	
	Urban	Rural	Urban	Rural	Urban	Rural
Under-Five Mortality (PER 1,000 LIVE BIRTHS)	63	104	32	48	122	151
Access to Adequate Sanitation (PERCENT OF HOUSEHOLDS)	73	14	86	70	98	86
Currently Using Contraception (PERCENT OF ALL WOMEN)	58	45	79	74	29	12.4
Median Years of Schooling (MEN)	8.3	5.8	8.1	5.4	5.7	2.1

NOTE: Sanitation data is for 2000 (all countries). All other data from India is for 1998-99; from Vietnam, 1997; from Tanzania, 1996.

SOURCE: Demographic and Health Survey, 1996, 1997 and 1999; World Bank, 2001.

The examples in this table illustrate that rural residents may have good reason to migrate to urban areas. Urban residents tend to enjoy better access to drinking water, sanitation, health services, jobs, and educational opportunities than their rural counterparts. While these benefits often do not extend to the poorest groups in a city, the chances of getting access are often better than in rural areas.

Implications for Business

In the next decade, more than half of the world's population will live in urban areas. Businesses often benefit from the growth of urban areas with their demand for energy and infrastructure, and their concentration of labor and consumers. The greatest change in urban populations will occur in developing countries which will raise new challenges but also lower the costs of serving the needs of these consumers. Sustaining and capitalizing on these opportunities will require business strategies and public-private partnerships that make cities better places in which to work, to operate a business, and to live. Improved land-use planning, health services, education, and water and sanitation services are urban priorities beyond the capacity of many local governments without private sector partnership.





Humans are increasingly mobile due to growing access to roads, cars, public transport, and airplanes. Still, the majority of people walk or bike to market, work, or school and millions of tons of goods are transported on people's backs, in cattle carts, and by pushcart. Movement of people and goods is essential to economic and business development. Mobility permits the division of labor, urban growth, trade in raw materials, fast and cheap cargo trade, and the quick transfer of employees. The global flux of people diversifies the workplace and the marketplace and fosters both formal and informal channels for the exchange of knowledge and information. All this mobility creates a large demand for energy and infrastructure. Access to less polluting and more efficient mobility is both a challenge and an opportunity for business.



Humans are more mobile, accelerating the flow of goods and knowledge and raising the demand for energy and infrastructure.

Facts

- In 1997, 54% of the oil purchased by OECD countries was for transport, with 62% projected in 2020.<sup>1</sup>
- With little variation around the world, people spend about an hour a day in transit, although those with higher incomes travel greater distances.<sup>2</sup>
- Transport of people and goods is responsible for about one fifth of worldwide energy consumption. Two thirds of transport energy demand in OECD countries is from passenger travel.<sup>3</sup>
- Ocean shipping of cargo has nearly doubled since 1975.<sup>4</sup>
- Mobility of populations and of high-risk individuals such as freight truck drivers is a significant factor in the spread of HIV/AIDS in Southern and Eastern Africa.<sup>5</sup>

Low Cost Shipping Spurs International Markets

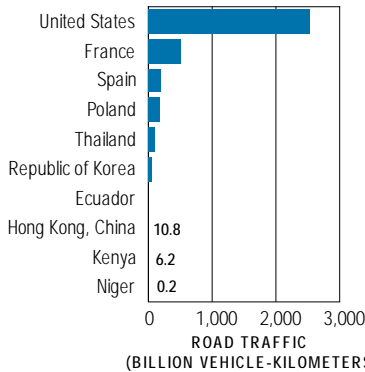
Ocean Shipping Demand, 1975-1995 (trillion tonne-km)					
YEAR	CRUDE PETROLEUM & PETROLEUM PRODUCTS	DRY BULK CARGO	GENERAL CARGO	TOTAL	CONTAINERIZED SHARE OF GENERAL CARGO
1975	15.7	5.0	4.5	25.2	0.0%
1980	14.7	6.6	6.0	27.3	20.7%
1985	8.3	7.2	5.6	21.1	30.1%
1990	12.6	8.5	6.5	27.6	35.1%
1995	15.0	9.4	8.1	32.5	43.7%

SOURCE: WBCSD, 2001.

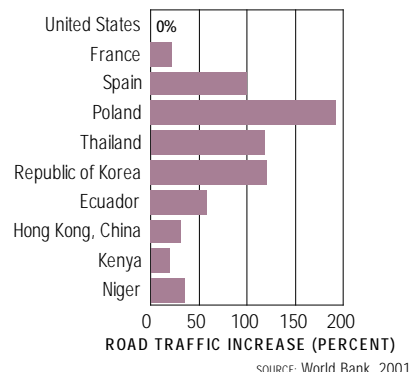
Freight transportation has been rising and consumes about 43% of transportation fuel, yet shipping often adds less than 1% to the cost of an item. Expanded use of containers, bigger ocean liners, and lower fuel costs have combined to reduce this cost of shipping and drive a global economy. Freight trade brings value to businesses and to individuals' quality of life yet also drives environmental degradation and other social problems. Freight carriers — ocean liners, trucks, airplanes, trains, and barges — contribute to water and air pollution, habitat alteration, and the movement of invasive species, and play a role in increasing urban congestion (see **Ecosystems**).<sup>6</sup>

Travel Is Growing Everywhere

Total Road Traffic in Selected Countries, 1999

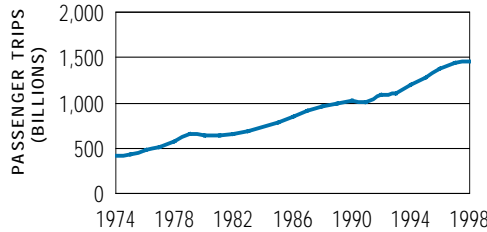


Increase in Road Traffic in Selected Countries, 1990-1999



SOURCE: World Bank, 2001.

Global Number of Air Passengers, 1974-1998



SOURCE: World Bank, 2000.

Travel by road and air has increased dramatically in recent decades while the share of travel by mass transit has decreased almost everywhere.<sup>7</sup> Passenger air trips have almost tripled in the last 25 years and are expected to triple again in the next 20 years.<sup>8</sup> The number of motor vehicles worldwide is increasing about 3% per year.<sup>9</sup> Rich countries have approximately 60 times more vehicles

per capita than the average low-income country, but vehicle ownership has tripled in low-income countries in the past 17 years.<sup>10</sup> Countries like Cambodia, El Salvador, South Korea, and Thailand more than doubled the road traffic (number of vehicles multiplied by average distance they travel) within their borders between 1990 and 1999 (see **Consumption**).<sup>11</sup>

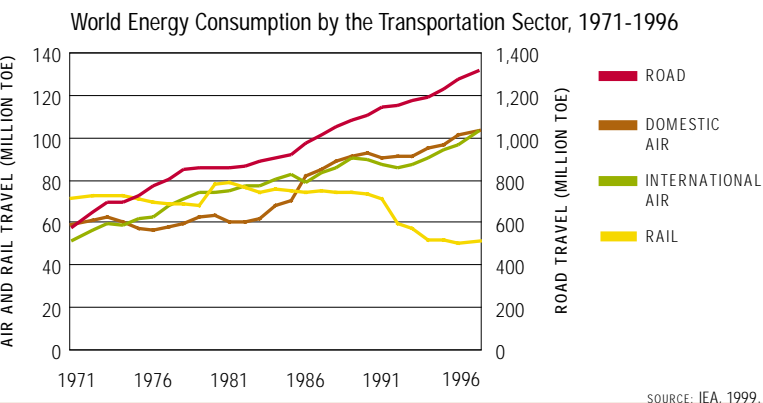
Transport of people and goods is responsible for about one fifth of worldwide energy consumption.



RELATED TRENDS

Energy	24
Wealth	12
Democracy	50

Transport Drives Society's Thirst For Fuel



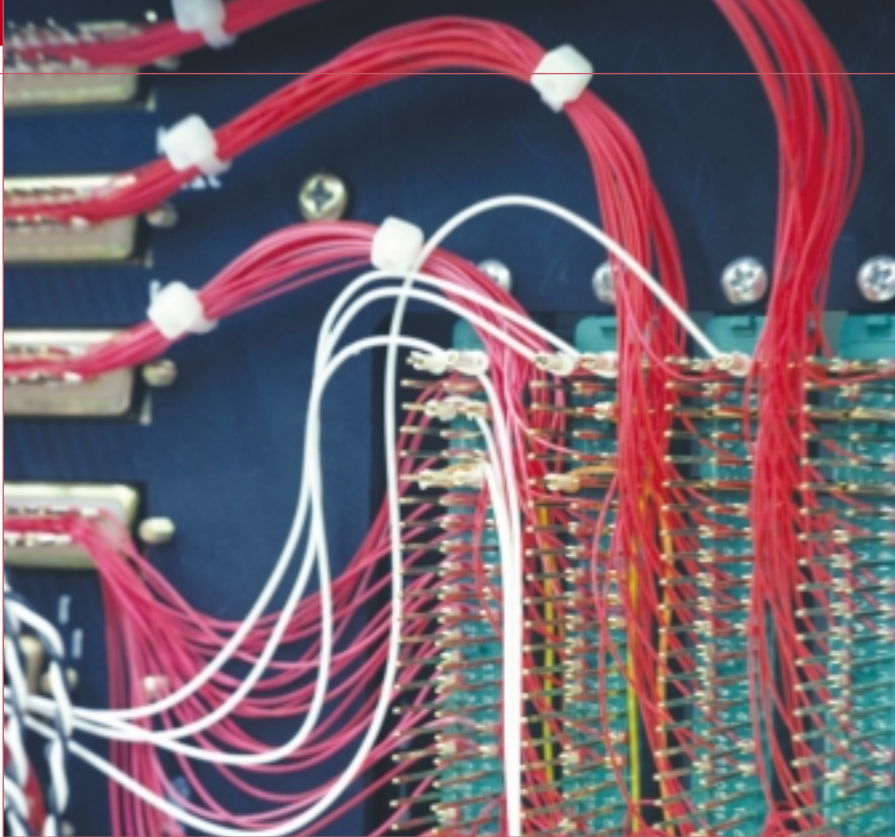
SOURCE: IEA, 1999.

Growing mobility has led to dramatic growth in energy use, greenhouse gas emissions, and other forms of pollution (see **Emissions**). In 1997, international marine shipping used 132 million tons of oil equivalent.<sup>12</sup> One indication of a world-on-the-move is the 80% increase in worldwide energy used for air travel and the nearly 120% rise in global energy for road transportation between 1971–1997. Road travel now represents 80% of total transportation energy use.<sup>13</sup> Most of the rising energy demand for road travel occurred in Eastern Europe, China, and Southeast Asia.<sup>14</sup>

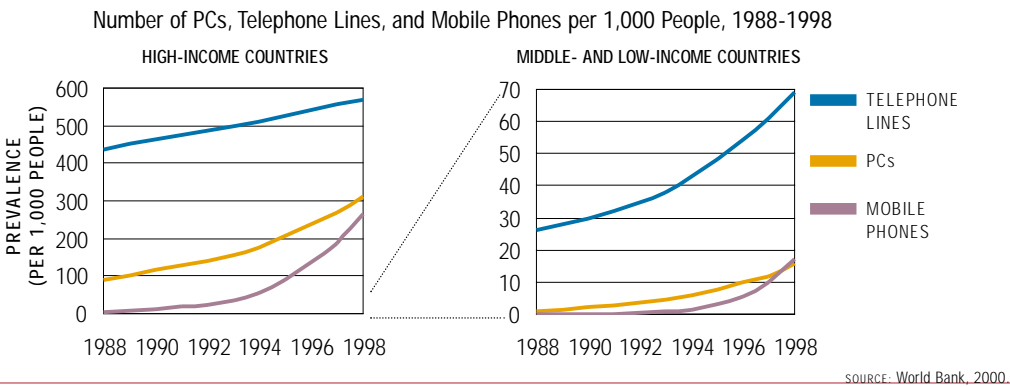
Implications for Business

Increased mobility creates a 24-hour international business workday that puts workers on the road and accelerates economic and social change. Transportation also moves knowledge, disease, threats to public safety, and social unrest. Mobility opens market opportunities yet also allows entry of new competitors. Sustainable mobility is a major area of business investment and innovation as companies race to create affordable and efficient alternative fuel vehicles for freight and transit systems. In addition to designing efficient technologies, business plays a role along with the public sector in realizing easy and equal access to mobility. New technologies will only work in concert with changes in the way public institutions address the real costs of mobility-related infrastructure and energy use. Locating business activities near public transport, creating links between existing transport hubs, and providing incentives to employees to use public transit systems help encourage the use and development of energy-efficient public transport.

Access to telephones and the Internet is expanding quickly, although access is still limited in many parts of the world. As the Internet grows, it knits together markets and communities, facilitates the worldwide exchange of knowledge and services, and the movement of people and goods. The application of information and communication technologies helps the private sector launch new enterprises, reduce the costs of business transactions, and improve efficiency throughout the supply chain. Digital networks can improve productivity and enable people to participate in decisions that affect their lives — from natural resource use to politics. In the developing world, these technologies can enable billions of people to participate in the world economy by breaking down the spatial barriers between people and distant markets and employers (see **Labor**). Information and communication technologies promise significant opportunities for developing countries to create new development paths. Companies are creating new business models to connect rural villages with low-cost wireless technologies, to enable efficient micro-lending by using information technology, and to establish multi-purpose Internet centers for basic education, workforce training, small business lending, and agricultural information.<sup>1</sup> The Internet also enables the creation of new service businesses, from back office information processing to customer call centers; enterprises that can provide alternative livelihoods to traditional manufacturing and resource extraction industries.



Emergence Of A Wired World



Though starting from a low base, connectivity via phones, and computers is growing fastest in the developing countries.<sup>11</sup> The application of information technologies and telecommunications promises to help emerging economies leapfrog traditional development patterns in favor of high-tech and high-efficiency economic pathways (see **Privatization**). However, Internet users need to be literate and it will be more difficult to surmount the problem of illiteracy in regions such as South Asia and Sub-Saharan Africa (see **Education**).



Access to information and communication technologies enables economic opportunities.

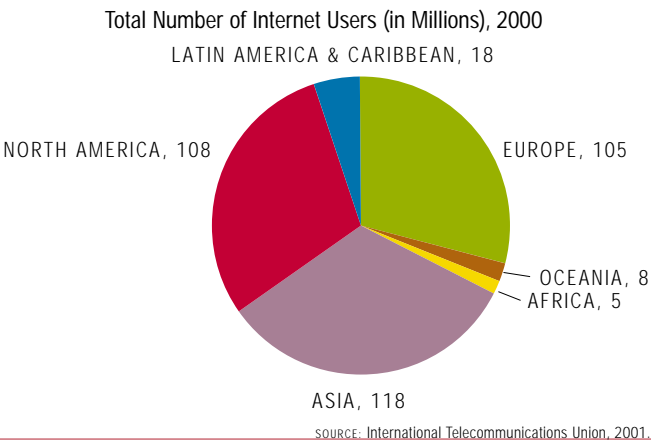
More than half the world's citizens have never used a telephone, 7% have access to a personal computer, and only 4% have access to the Internet.

RELATED TRENDS	
Accountability	52
Democracy	50
Education	18

Facts

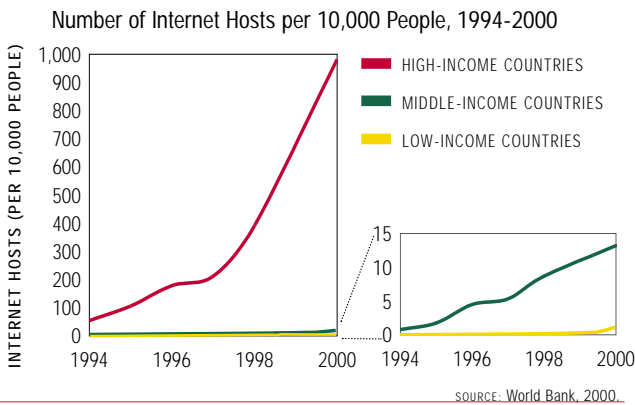
- More than half the world's citizens have never used a telephone, 7% have access to a personal computer, and only 4% have access to the Internet.<sup>2</sup>
- Today, over 400 million people use the Internet, having grown from less than 20 million only 5 years ago. By 2005, there are forecast to be 1 billion Internet users.<sup>3</sup>
- In 2000 there were 214 countries connected to the Internet — up from 60 in 1993 and just 8 in 1988.<sup>4</sup>
- Internet use has been expanding in Latin America by more than 30% per year since 1998.<sup>5</sup>
- Estimates of global electronic commerce in 2000 range considerably, but most estimates are near US\$200 billion.<sup>6</sup>
- The lion's share of e-commerce dollars is the business-to-business sector, which is expected to reach US\$1.2 trillion to US\$10 trillion by 2003.<sup>7</sup>
- In the United States, 20 hours of Internet access per month costs about 1% of the average income, compared to 15% in Mexico, 278% in Bangladesh, and 614% in Madagascar.<sup>8</sup>

Who Is Using The Web?



North America, Europe, and Asia each currently have about 100 million Web users.<sup>9</sup> The approximate penetration rates (users per 1,000 people) of 35% in North America are significantly higher than those in Europe (14%), Asia (3%), Latin America (3%), and Africa (1%).<sup>10</sup> As this “digital divide” closes, proportionately more Internet use will be in developing countries, although Internet access may remain out of reach of most of the world's poor for decades.

Internet Hosts Are Booming Worldwide



Worldwide, the number of Internet hosts per 10,000 people — a rough indicator of the “size” of the web — grew 500% from 1996 to 2000. High-income countries completely dominate this indicator, with nearly 1,000 hosts per 10,000 people; middle-income countries have about 13 hosts per 10,000 people, and low-income countries only 0.5.<sup>12</sup> There are regional exceptions such as Latin America and the Caribbean where there are now 30 hosts per 10,000 people. In developing regions, however, every connection may serve many members of a single community.

Implications for Business

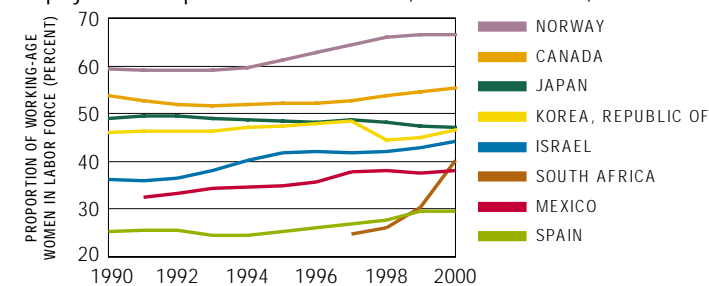
The communications revolution can power the transition from a natural resource-based economy to a knowledge-based economy. Digital technologies can create gains in transactional efficiency, improved manufacturing controls, alternatives to paper, and energy-efficient logistics and production — helping businesses to become more environmentally sound and providing the means to inform purchasers about ecological impacts of products.<sup>13</sup> Connectivity can connect the world's poor to the international economy and to entrepreneurial and educational opportunities. Innovative use of the Internet, combined with software designed for illiterate users, and low-cost, solar-powered wireless devices, is already increasing incomes in developing countries.<sup>14</sup> Emerging communications technologies also help balance power between people, corporations, and nations by enabling businesses, government, and civil society to scrutinize each other and share information. However, the Internet may also create a negative “rebound effect.” Lower costs and successful economic development will increase gross consumption levels and environmental impacts unless there is product and process innovation for sustainable production and consumption.<sup>15</sup> Also, if steps are not taken to ensure wide access to digital technologies, the Internet may exacerbate existing inequalities and strengthen monopolies.



The global labor force is growing and more women are moving from the informal to the formal labor sector as part of the transition of developing economies from an agricultural base to a manufacturing and service base.<sup>1</sup> Nearly all the projected growth in the labor force by 2025 will come from low- and middle-income countries and many of these new workers will need the skills demanded by manufacturing, technology, and information-based industries. Global competition enabled by more open trade, foreign direct investment and privatization, outsourcing of manufacturing, and growth of export-related activities spell a mixed future for laborers around the world — there will be employment losses in some areas and growth in others. Yet these changes also serve to raise the advantage that education provides to workers and create more opportunities for women.<sup>2</sup>

### Closing The Gender Gap In Labor Markets

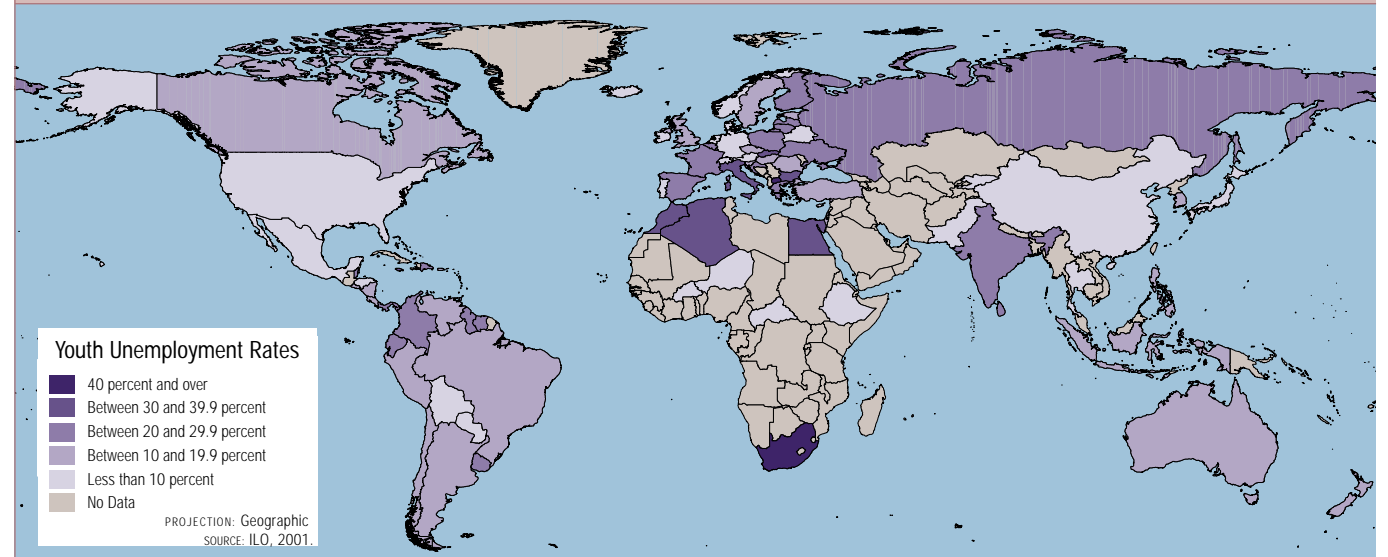
Employment-to-Population Ratio for Women, Selected Countries, 1990-2000



SOURCE: ILO, 2001.

Women's participation in the labor force is lowest in the Middle East and North Africa and is highest in Sub-Saharan and Asian-Pacific economies, and in Norway and Sweden. In most countries the proportion of the working-age male population that is employed ranges from 60-70%. However, men are much more likely to be employed than women; the employment gender gap in developed countries averages 18%, only 12% in transition economies, and 36% in the Middle East and North Africa. Of the 59 economies for which the International Labour Organization (ILO) has data for the 1990s, the employment-to-population ratio declined for men and rose for women. In most countries, women have higher unemployment than men due to employment pauses for childrearing, fewer occupational options, lower levels of education and skills training, and layoffs due to less seniority (see **Education**).<sup>3</sup>

### Employing Young People Promotes Long-Term Growth And Stability



Youth (people ages 15-24) unemployment in most countries is about twice that of adult (ages 25-65) unemployment and is often substantially higher for young women than for young men. Youth employment is important for national and international development; unemployment at these early ages may harm future employment opportunity, damage social cohesion, and create unrest.<sup>10</sup>

## As economies become service-based, women are a growing part of the formal labor force.

In developed countries, the working age population will shrink from approximately 740 million to 690 million people between 2000 and 2025 but will increase in developing countries from about 3 billion to 4 billion people.

#### RELATED TRENDS

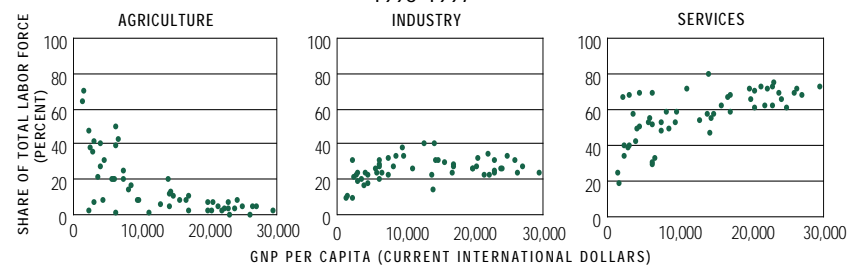
Education	18
Wealth	12
Mobility	42

### Facts

- In developed countries, the working age population (15-60 years) will shrink from approximately 740 million to 690 million people between 2000 and 2025. In the developing world, the working age population will increase 43% from approximately 3 billion to 4 billion people.<sup>4</sup>
- Approximately 50% of women are employed in the formal labor force and comprise one third of all workers. However, women earn about two thirds of what men earn in comparable jobs, and less than one fifth of total wages go to women.<sup>5</sup>
- In 1998, service sector jobs accounted for 64% of all jobs in the OECD countries.<sup>6</sup>
- The OECD estimated in 2000 that in the Information & Communication Technology sector there was a shortage of 850,000 technical staff in the United States and 2 million in Europe.<sup>7</sup>

### New Doors Open For Women

Percentage of Labor Force Employed in Various Sectors vs. Gross National Product, 1996-1997

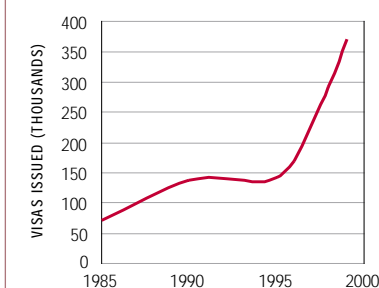


SOURCE: World Bank, World Development Indicators, 2000.

As economies develop, fewer people are employed in agriculture and more in positions that require advanced skills and training in industry and services; the distribution of economic wealth in the world is strongly correlated with employment by sector. More women are employed in agriculture in the Asian, Pacific, and Sub-Saharan nations, whereas developed and transition economies have more men involved in agricultural production. Worldwide, more men are employed in the industrial sector while women generally find more employment in the service sector.<sup>8</sup> In the OECD countries, the ratio of women to men in the goods-producing sectors is 0.35:1, in the services sector the ratio is 1:1, and women outnumber men 1.8:1 in social services such as health and education.<sup>9</sup>

### Imports Of Skilled Workers Grow

Non-Resident U.S. Visas Granted to Specialty Workers, 1985-1999



H1B Visa Quotas, 1992-2000

YEAR	QUOTA	STATUS
1992	65,000	unfilled
1996	65,000	unfilled
1998	65,000	filled in September
1999	115,000	filled in June
2000	195,000	filled in March

SOURCE: US Department of Justice, 1998; OECD, 2001.

Demand for skilled labor is increasing, particularly in the high growth areas of business and professional services that are information technology-intensive. Though wages and unemployment data in the OECD countries do not currently reflect a shortage of skilled labor, most of the member countries have adapted policies to allow immigration of skilled foreign workers.<sup>11</sup> In recent years, the United States has allowed immigration of greater numbers of skilled workers and quickly filled the quotas.



### Implications for Business

Increasing the skills of workers — particularly women — is crucial for business success in an integrated and competitive global economy. Labor capacity is not solely a matter of traditional education but is increasingly built through adult education and worker training within a context of career-long learning and career management.<sup>12</sup> Investing in workers boosts the living standards of households, increases productivity, and creates a broader customer base. Companies will successfully recruit and retain employees in competitive labor markets if they anticipate rising expectations of job quality, maternity benefits, flexible working hours, provision of child-care services, and access to professional training. Trade and the expansion of multinational companies creates an ethnically diverse labor force — an advantage to companies that want employees who can understand the needs of international and diverse markets and who can help companies locate operations where consumer and labor markets are growing.



# Roles and Responsibilities



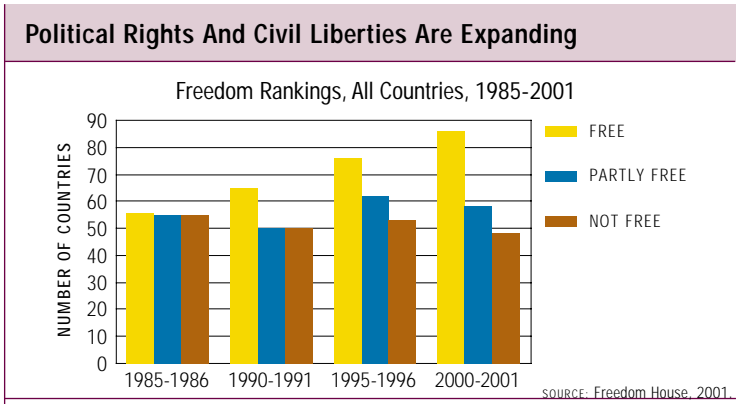
## EARNING LICENSE-TO-OPERATE

- Democracy
- Accountability
- Privatization

Businesses must meet national rules and standards for commerce, and also international agreements, codes of conduct, and the standards of civil society at home and abroad. The public and many governments will hold businesses accountable to be socially responsible — that they will promote development that meets basic human needs, support democracy, share information, and be open to the scrutiny and input of civil society.



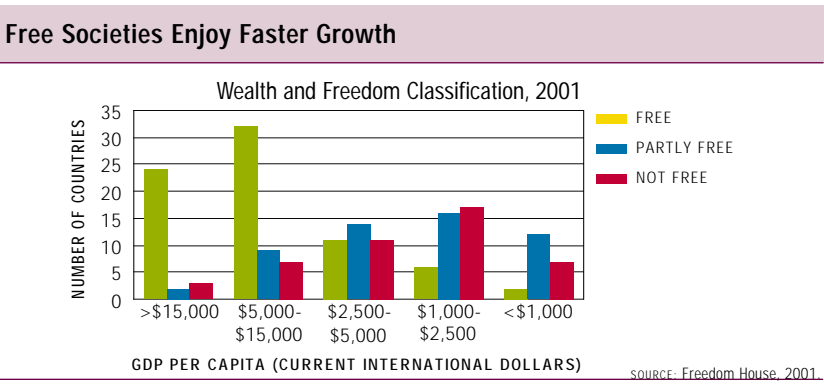
More people live in countries with elected democratic governments than at any other time in history. In many countries, the transition from state-controlled economies to market-based approaches has contributed to stable operating conditions and a common set of rules for international business competition (see **Privatization**). Countries are adopting international instruments of governance, including formal commitments to standards of human rights and environmental protection and gaining membership in the World Trade Organization (WTO). Democracies also benefit from an informed public, non-governmental organizations (NGOs) that are free to organize, and a media unfettered by restrictions of free speech — all conditions that help combat corruption (see **Accountability**). Today the challenge remains — to support democratic efforts to reduce corruption, promote sustainable development, and to increase the transparency of and participation in government processes.



In 2001, the citizens of 86 countries worldwide could rely on a broad range of political rights and civil liberties; their countries were rated as “Free” in Freedom House’s annual survey. The survey is based on political rights and civil liberties enjoyed by citizens, and not solely on political structure. Citizens in 58 “Partly Free” countries live with more limited political rights and civil liberties. Limits on political and civil liberties can be caused by weak rule of law, single-party political dominance, and inter-ethnic or religious violence. Basic political rights and civil liberties are denied people in 48 countries classified as “Not Free.”<sup>1</sup>

Facts

- The number of democratic states in the world has grown from 22 democratic states out of 154 total countries (14.3%) in 1950, to 119 democratic states out of 192 total countries (62%) in 2000.<sup>3</sup>
- The number of countries that have ratified the six major human rights conventions and covenants has grown from 10% to half of all countries between 1990 and 2001.<sup>4</sup>
- The number of countries that have joined the General Agreement on Tariffs and Trade (GATT) and WTO has risen from 85 in 1980 to 134 in 1999.<sup>5</sup>
- Seventy-one percent (71%) of the world’s exports now fall under WTO disciplines, with a growing share of exports coming from developing countries.<sup>6</sup>



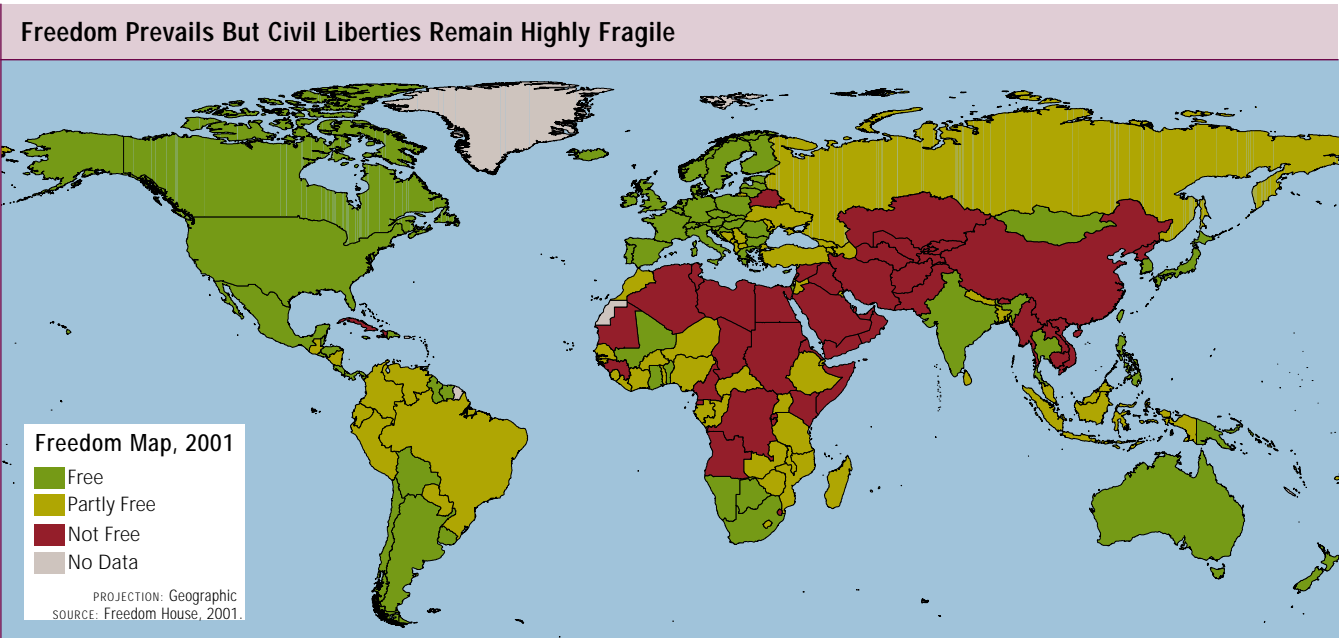
The median per capita GDP is almost seven times higher for the Freest countries than in the lowest category of Not Free countries. Almost all countries with per capita GDP higher than US\$15,000 are Free, and most are Free where per capita GDP is between US\$5,000 and US\$15,000 (see **Wealth**). Countries that are freer grow — on average — more quickly as well. Notably, this is true even for the less affluent Free countries of less than US\$5,000 per person per year (e.g. Benin, Bolivia, the Dominican Republic, El Salvador, India, and Papua New Guinea). Among countries with GDP per capita less than \$5,000, the growth rates of Free, Partly Free, and Not Free countries in 1990–1998 were 3.23%, 1.47% and 1.41% respectively.<sup>7</sup> Countries with high economic growth rates and a Not Free classification, such as China, are uncommon.



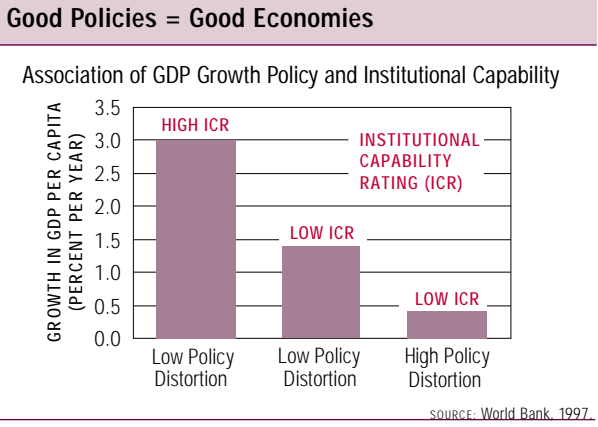
Democracy spreads, creating improved conditions for market-based economies.

The number of democratic states in the world has grown from 22 democratic states out of 154 total countries in 1950, to 119 democratic states out of 192 total countries in 2000.

RELATED TRENDS	
Accountability	52
Education	18
Communications	44



The proportion of the world’s population living in freedom has grown from 36% in 1981 to 41% in 2001. The proportion of the world’s population lacking basic political rights and civil liberties has fallen from 43% to 36%. While gains in elected governments have been positive, in 66 countries the improvements of civil liberties are lagging behind improvements of political rights.<sup>2</sup> Gains in freedom are especially threatened during financial and social crises, which often lead to non-democratic means to restore law and order.



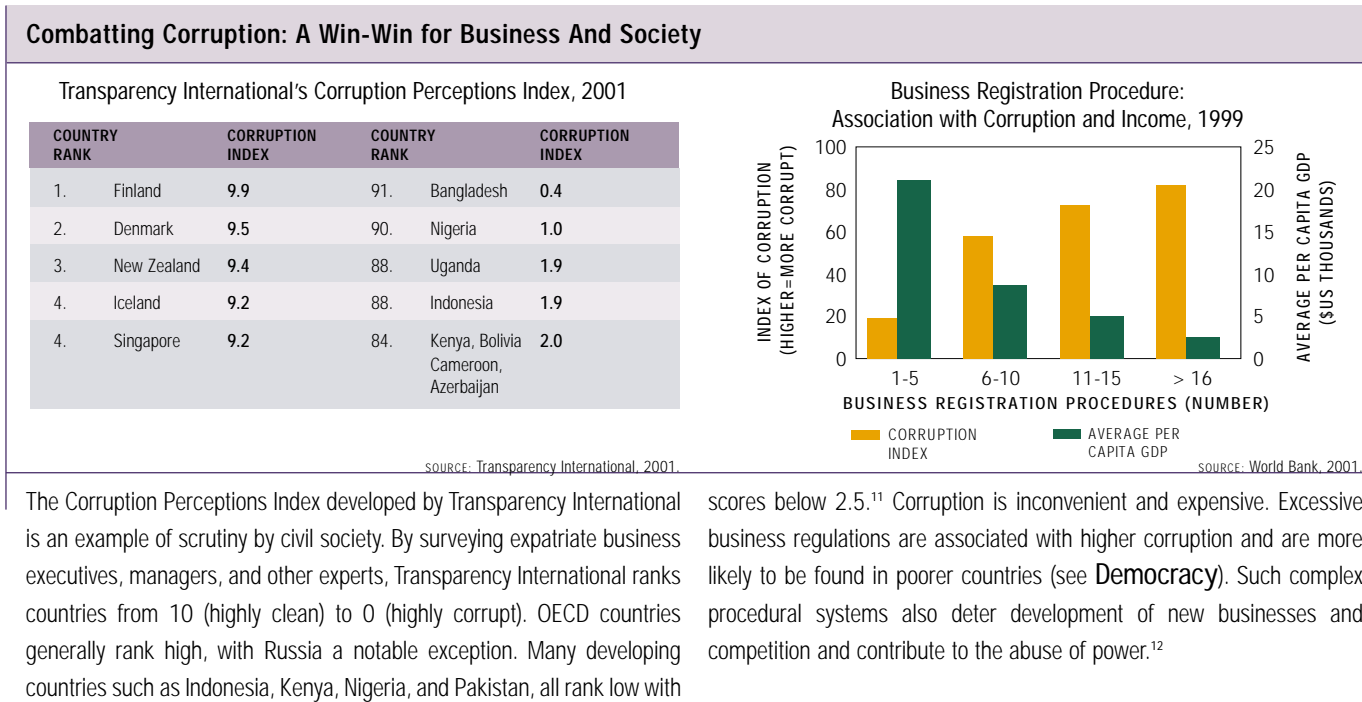
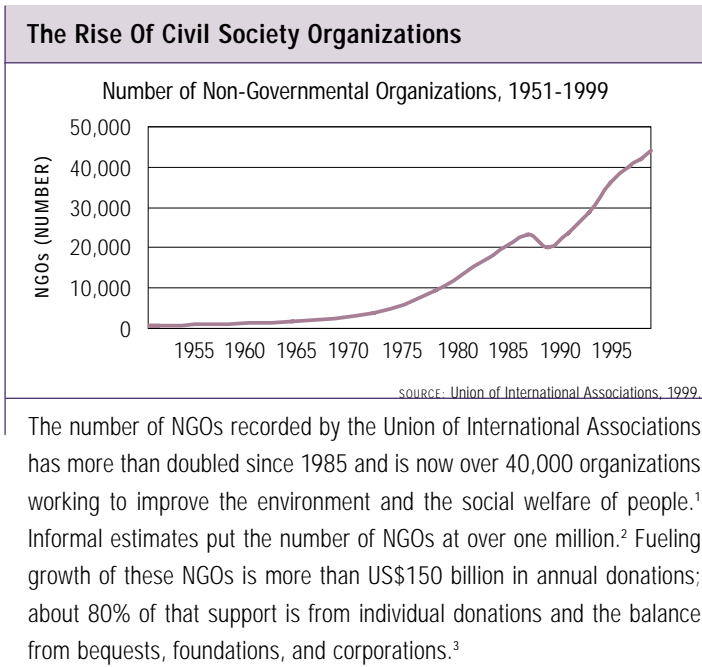
Governments that have made changes in their macroeconomic policies and that have also made institutional reforms in the areas of social services, public works, banking, and overall regulations show much faster growth in GDP per capita.<sup>8</sup> Where the change toward electoral democracies is paralleled with progress toward freer civic institutions, an active and diverse media, a strengthened judiciary, and property rights, a solid foundation is created for long-term business operations.

Implications for Business

Democratic societies tend to offer the conditions for secure business operations, investment, and growth. In these societies, stakeholders and shareholders are holding corporations to a single high international standard. Business partnerships with dictatorial governments are scrutinized by an international network of NGOs, which makes the operations of ethical companies in non-democratic countries difficult and jeopardizes companies’ license-to-operate at home and abroad. Companies will face the hard question of whether to operate in non-democratic environments and perhaps support democratic change through their own practices but risk harming their regional or international reputation. Ultimately, trends toward democracy, fair and transparent governance, and the development of global corporate standards are in the best interests of companies as they provide long-term benefits to reputation and operating freedom.



Civil society has a growing influence on government and business affairs. Many non-governmental organizations (NGOs) focus on making business and government activities more transparent to the public and more accountable to laws and to stakeholders who may be neither customers nor shareholders. Global business operations are scrutinized by NGOs that are well-organized, media savvy, active as shareholders, and connected by the Internet (see **Communications**). Businesses are responding to this public interest by reporting on environmental and social performance, and with innovative products and services that address public concerns about resource use, energy, and the environment. Others are engaging stakeholders in operational decisions and are partnering with NGOs to catalyze corporate change, to improve the bottom line, to protect reputation, and to earn license-to-operate in emerging markets.



Civil society is demanding greater accountability and transparency from government and business.

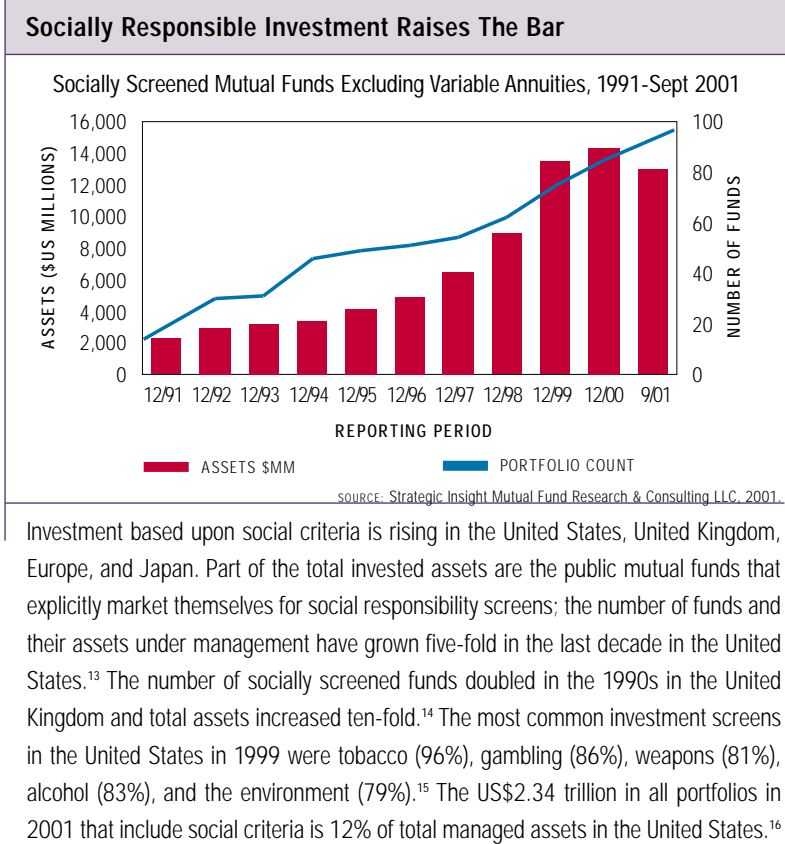
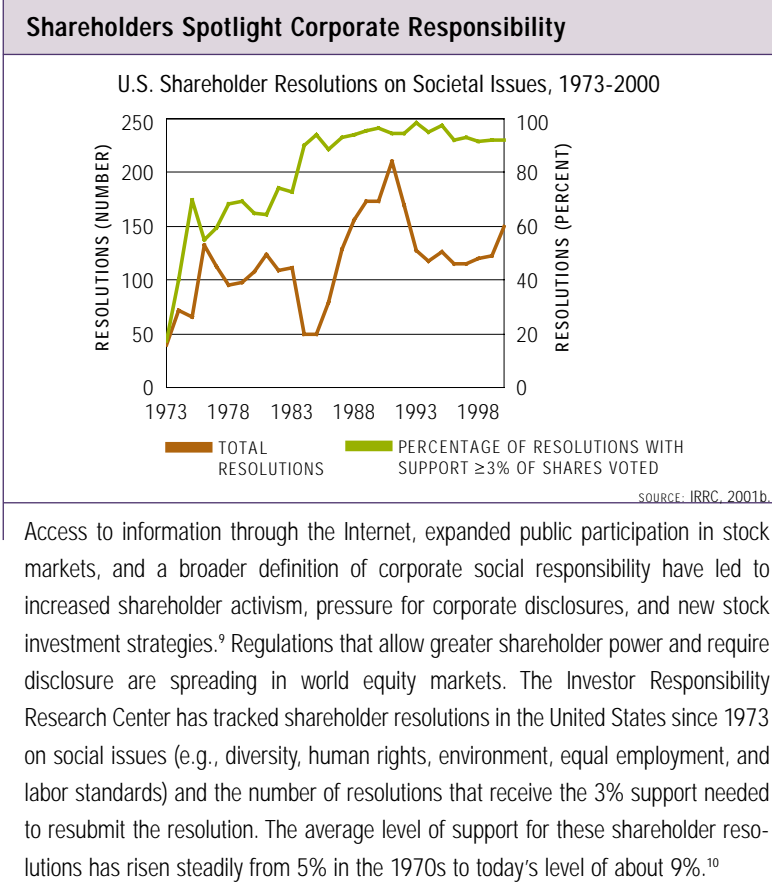
Currently 2,091 NGOs hold consultative status at the United Nations, compared to 928 in 1991 and just 41 in 1948.



RELATED TRENDS	
Communications	44
Consumption	22
Wealth	12

Facts

- About 10% of all development aid is channeled through NGOs, an amount that is expected to rise.<sup>4</sup>
- Currently 2,091 NGOs hold consultative status at the United Nations, compared to 928 in 1991 and just 41 in 1948.<sup>5</sup>
- Approximately 2,000 companies voluntarily report on their economic, environmental and social policies, practices, and performance — about 100 of these using a new international standard.<sup>6</sup>
- The number of socially screened mutual funds in the United States increased from 168 funds in 1999 to 230 funds in 2001.<sup>7</sup>
- The total of United States managed investment assets grew 22% from 1999 to 2001; socially screened assets under professional management grew by 36% in the same period.<sup>8</sup>

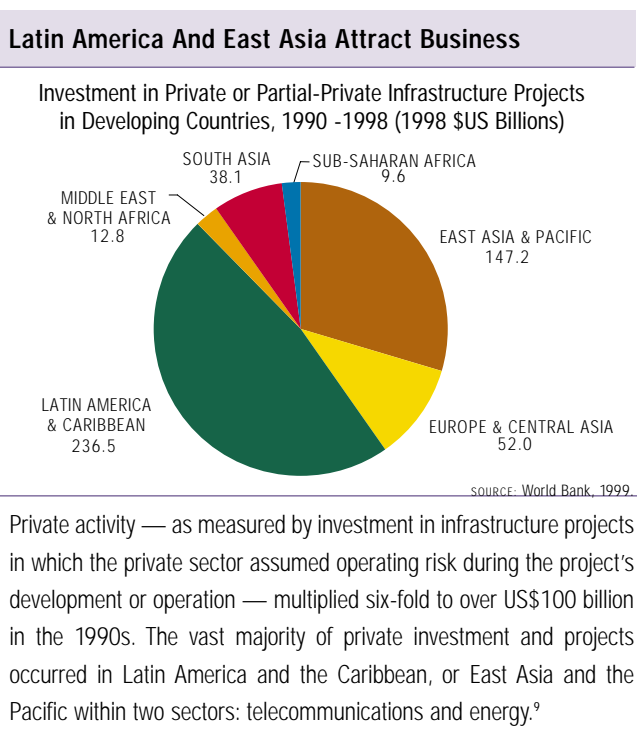
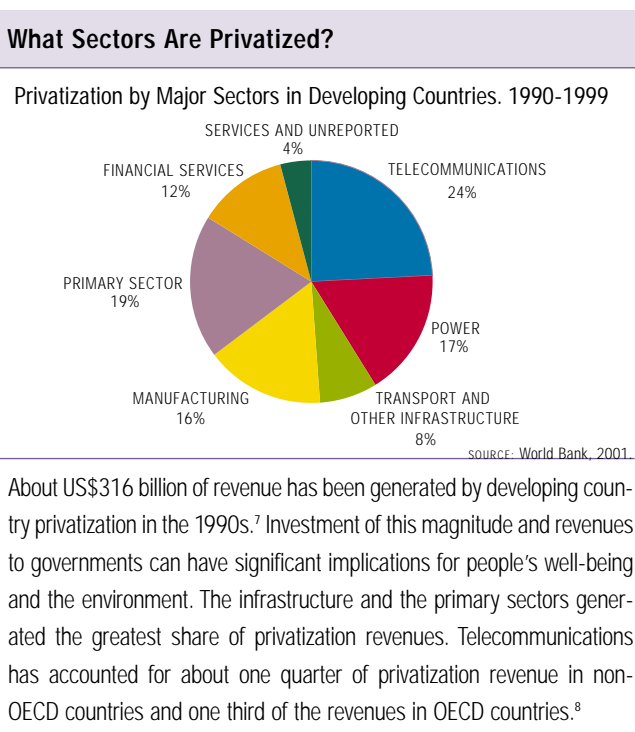
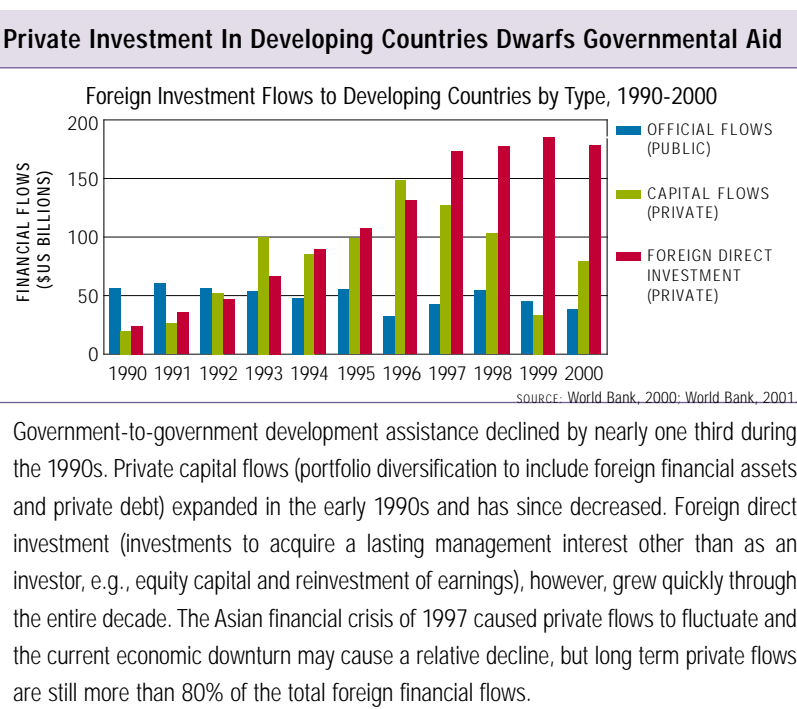


Implications for Business

Rising public involvement in government and business affairs is seen in the growth and activism of non-governmental organizations, and in pressures to disclose environmental and social performance to investors. Civil society creates pressures for business to be more open and transparent in the way it deals with the public, government, other businesses, and local communities. International NGOs ensure that corporate activities anywhere in the world are under stakeholder and shareholder scrutiny. Failure to perform responsibly in a distant market or along the supply chain or in the launch of new products and technologies may erode corporate reputation and harm competitive position in core markets and in equity markets. Active engagement with stakeholders and documented good performance can protect license-to-operate, drive product and service innovation, reduce legal liabilities, and improve business strategy.



In the past decade, private sector investment in low- and middle-income countries has been growing quickly and governmental development aid has been on the wane. Governments are looking more and more to privatization as they seek to reform economies, reduce deficits, attract investments, liberalize and expand equity markets, and improve efficiency. When the private sector acquires state-owned enterprises, it often helps financial markets mature when that privatization includes public equity. Though governments still operate most infrastructure in low- and middle-income countries, the number of countries initiating privatization, the number of public projects with private sector participation, as well as the level of private sector investment are growing. Private sector investment may also transfer best practices for labor rights, resource efficiency, and environmental safety to transition and emerging economies.



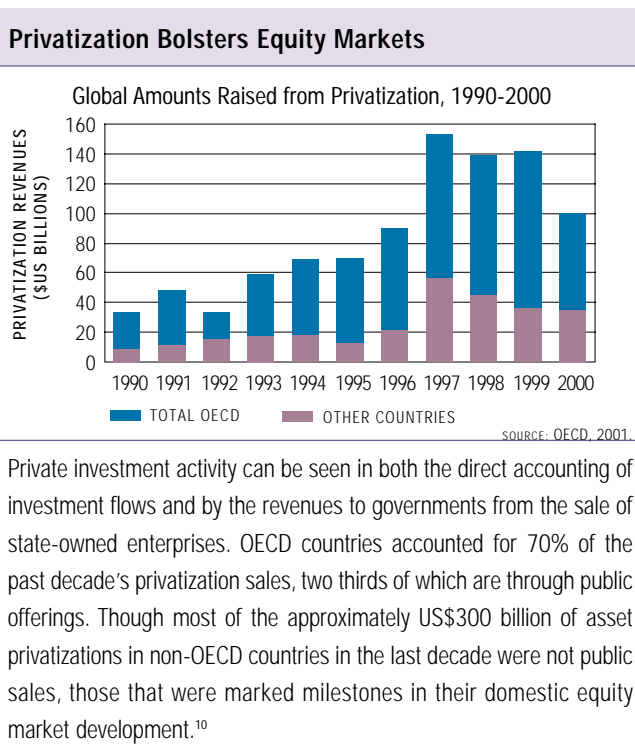
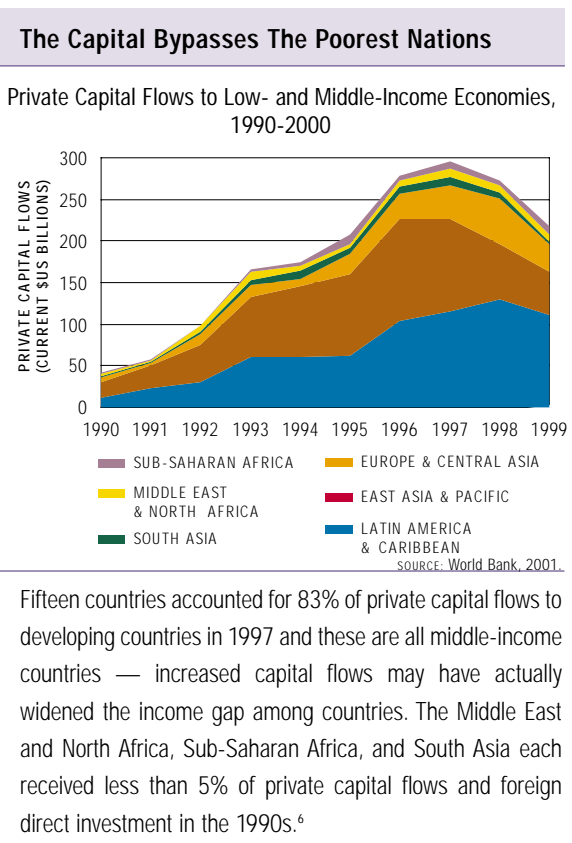
Private sector investment is increasingly financing economic development.



Foreign direct investment in developing countries has risen from about US\$24 billion in 1990 to US\$178 billion in 2000 as official development aid declined from about US\$55 billion to US\$39 billion.

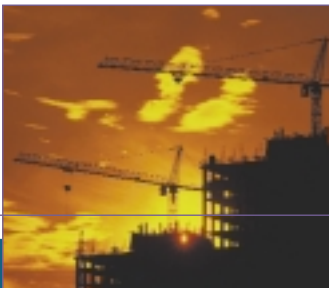
RELATED TRENDS	
Agriculture	34
Water	36
Education	18

- Facts**
- In 2000, official overseas development assistance (ODA) to developing countries totaled US\$53.1 billion and foreign direct investment (FDI) was \$120 billion; developing countries average about one fourth of international foreign development assistance.<sup>1</sup>
  - In constant dollars, between 1970 and 1998, net inflows of foreign direct investment grew almost seven times faster than world GDP and four times faster than world exports of goods and services.<sup>2</sup>
  - Foreign direct investment in developing countries has risen from about US\$24 billion in 1990 to US\$178 billion in 2000 as flows of official development aid declined from about US\$55 billion to US\$39 billion.<sup>3</sup>
  - Between 1988 and 1995, revenues from the sale of state-owned-enterprises grew from US\$2.6 billion to over US\$21 billion. Latin America and East Asia generated the largest amount of revenues at 51% and 21% respectively.<sup>4</sup>
  - In 1999, the primary sector (including petroleum, mining, agriculture, and forestry) accounted for US\$18.1 billion (41% of the total) privatization revenues in emerging economies — almost entirely by oil and gas sales in Argentina, Brazil, India, Poland, and Russia.<sup>5</sup>



**Implications for Business**

Privatization has given business a greater say in the developing world's economic future.<sup>11</sup> The private sector has eclipsed but not replaced government as the major financier of development but still does not serve the poorest nations. Privatization focuses more attention upon the behavior of corporations and on the conditions that allow their license-to-operate. The expectation of the private ownership is to upgrade technologies, practices, and performance. Inconsistent standards among domestic and foreign subsidiaries are becoming increasingly difficult to justify and to maintain. Still, the state retains significant influence over the economic and social well-being of developing countries and private sector enterprises will have to adjust to an emerging partnership between the public and private sectors. Projections of population and economic growth mean that the investment opportunities of the past decade may be just a fraction of the potential future privatization markets.



# Tomorrow's Market

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World Business Council for Sustainable Development

The World Business Council for Sustainable Development (WBCSD) is a coalition of 160 international companies united by a shared commitment to sustainable development via the three pillars of economic growth, ecological balance and social progress. Our members are drawn from more than 30 countries and 20 major industrial sectors. We also benefit from a Global Network of 35 national and regional business councils and partner organizations involving some 1000 business leaders globally.

**MISSION:** To provide business leadership as a catalyst for change toward sustainable development, and to promote the role of eco-efficiency, innovation and corporate social responsibility.

**AIMS:** Our objectives and strategic directions, based on this dedication, include:

- Business leadership — to be the leading business advocate on issues connected with sustainable development.
- Policy development — to participate in policy development in order to create a framework that allows business to contribute effectively to sustainable development.
- Best practice — to demonstrate business progress in environmental and resource management and corporate social responsibility and to share leading-edge practices among our members.
- Global outreach — to contribute to a sustainable future for developing nations and nations in transition.

For more information, please visit the WBCSD website: <http://www.wbcd.org>







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