**The World is Flat: Implications for Higher Education Planners and Leaders**[1]

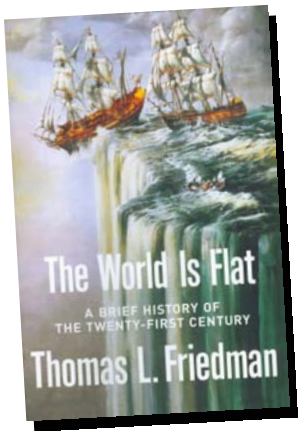
Paul E. Lingenfelter
President, State Higher Education Executive Officers
May 29, 2006

I have been asked to talk today about current issues in higher education. In this kind of situation, it is tempting to make predictions about the future. But I've never had much use for prophets or "futurists." They always seem to have too little knowledge and too much self-confidence.

There are some advantages, however, of getting older. Thirty years ago I thought nations in the "third world" would eventually start catching up with the prosperity of the United States and other developed nations. Inequality of opportunity ***should*** be unsustainable, and inevitably it is, even though wealth clearly gives enormous advantages over many generations. I also thought the growing dependence of the United States on imported oil and our neglect of energy conservation would have serious consequences. These "predictions" seem to be coming true, even if it didn't take a lot of foresight to make them.

Without claiming powers for divining the future, let me share some information about trends which have important implications for the future of higher education.

I want to begin with a quick review of Tom Friedman's best selling book, *The World is Flat.* Friedman's title, of course, is a play on words. He means to say the "playing field" of the world economy has become more "flat," rather than being tilted so much in favor of more developed economies like the United States, Japan, and Western Europe. Freidman identifies ten forces that are "flattening" the world. They are:




1. **Fall of Berlin Wall 11/9/89**
2. **First Mainstream Web Browser – Netscape goes public, 8/9/95**
3. **Work Flow Software – Standardized applications, Pay-pal (e-Bay), et al**
4. **Open Sourcing – Apache Adobe readers, LINEX**
5. **Outsourcing – Y2K, spin off functions to India**
6. **Offshoring – China in the WTO, capital flows to find cheap labor**
7. **Supply-chaining – Wal-Mart retailer to manufacturers**
8. **Insourcing – UPS services linked to shipping**
9. **In-forming – "Google-like" intelligent searches and data mining**
10. **"The Steroids" Wireless Mobile Digital Communication**

---

[1] Keynote address for "Higher Education Facilities: Issues and Trends" *An international seminar organized by the OECD Programme on Educational Building (PEB), the OECD Programme on Institutional Management in Higher Education (IMHE), the Mexican Secretariat of Public Education (SEP), the Administrative Board of the Federal School Construction Programme (CAPFCE, Mexico) and the National Association of Universities and Higher Education Institutions (ANUIES, Mexico) Zacatecas, Zacatecas, Mexico, 29 – 30 May 2006*

Some think Friedman downplays the negative aspects of globalization and undervalues the important and essential roles of governments in the world economy. These are legitimate reservations, but they do not diminish his achievements. Freidman has grasped and masterfully articulated powerful forces that are dramatically changing the world.

The "world flattening forces" Freidman writes about are based in the global transformation from a manufacturing economy concentrated in a few countries, to a knowledge economy which, empowered by information technology and the internet, has the potential to spread throughout the world. The forces driving this transformation are not entirely new; they have been with us for decades. The late Peter Drucker apparently first used the phrase, the "knowledge economy" in his 1968 book, *The Age of Discontinuity*. Thirty three years later, in November 2001, Drucker wrote a special survey in *The Economist* entitled "The Next Society," which includes these words:

*"The next society will be a knowledge society. Knowledge will be its key resource, and knowledge workers will be the dominant group in its workforce. Its three main characteristics will be:*

- *Borderlessness, because knowledge travels even more effortlessly than money.*
- *Upward mobility, available to everyone through easily acquired formal education.*
- *The potential for failure as well as success. Anyone can acquire the "means of production," i.e. the knowledge required for the job, but not everyone can win."*

I have the greatest respect for Peter Drucker, but I take exception to one of his predictions, which would have dire consequences for people in your line of work. In 1997 Drucker predicted in *Forbes Magazine* that technology would make large universities of brick and mortar obsolete within 30 years.

Steve Portch, a friend of mine, has suggested that Drucker must never have lived with a teenager. By they time they reach the age of 18 teenagers desperately want to leave home, and their parents desperately want them out of the house. Sending them to a college with bricks and mortar is an attractive option.

But without question the "knowledge economy" and Friedman's "flat world" have profound implications for every country, for the sustainability and quality of human life on the planet, and for higher education.

Let me summarize a few of the broader implications as they appear to me.

- First, geography and natural resources are likely to become even less important as a source of wealth and economic advantage – not irrelevant, but less important. Being in a community of talented people may be more important than being located close to natural resources or easy transportation.

- Second, the availability of cheaper labor will continue to be advantageous, but only temporarily. Jobs are likely to move across borders faster than ever before. Many manufacturing jobs have moved from the U.S. "rust belt," to the U.S. south, then to Mexico, and then to China. Eventually manufacturing jobs are likely to move from China to other less-developed countries.

- Third, the national economies that now lead the world are likely to become relatively less significant. Brazil, Russia, India, and China are growing much more rapidly than the U.S., England, France, Germany, Italy, and Japan.

- Fourth, higher education ***should*** become less of an elite enterprise; a much larger fraction of the world population will need higher education. Furthermore, "mass" higher education with lower standards of quality will not work. Everybody will not need or achieve a graduate education., but many more people must be educated to a higher standard than previously required. Achieving this goal will require both more effective education of disadvantaged groups and social policies to enable them to pay the costs of higher learning.

- Fifth, people are likely to obtain higher education throughout life, both as an economic necessity and as "consumer good." Many young are likely to make the transition from adolescence to adulthood in "brick and mortar" colleges and universities, but this will not be the end of their higher education.

- Sixth, the "means of production" in higher education and the providers of higher education will continue to become more diverse. More and more we are likely to employ technology to reduce costs and increase effectiveness, new providers will spring up to serve emerging markets, and established providers will diversify their services. (This is, of course, the continuation of a long trend. In my office library I found a book entitled, *Presidents Confront Reality: From Edifice Complex to University Without Walls.* It was published 30 years ago, in 1976.)

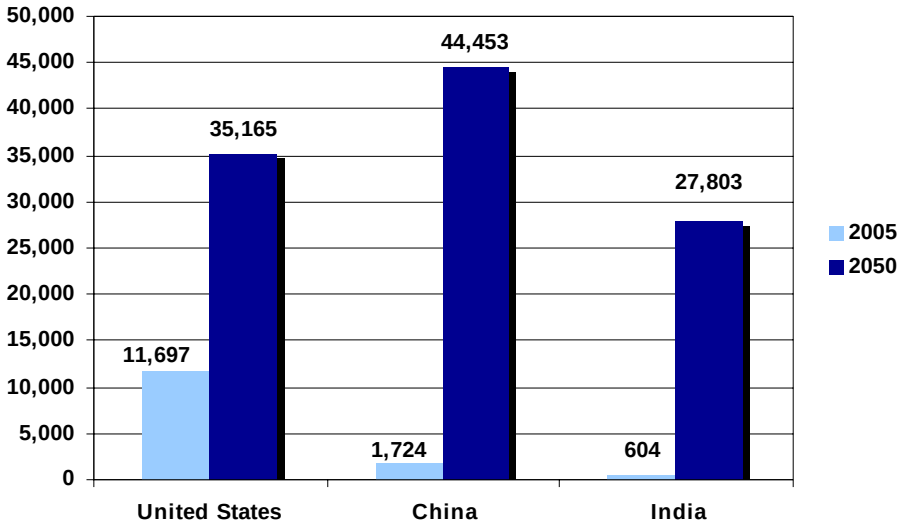
- Seventh, economic growth, population growth, and rising living standards will severely challenge world ecosystems, and those challenges will, in turn, challenge social and political systems. We must increase the scope and effectiveness of education so people can deal more effectively with such challenges, and we will become even more desperately dependent on innovative research to advance technology, increase energy efficiency, and ameliorate disease.

I do not have time to elaborate on all of these observations, but let me share some information to illustrate three of them: the re-alignment of national economies, the imperative for mass higher education, and the challenge to the world ecosystem.

**The growth and projected re-alignment of national economies**

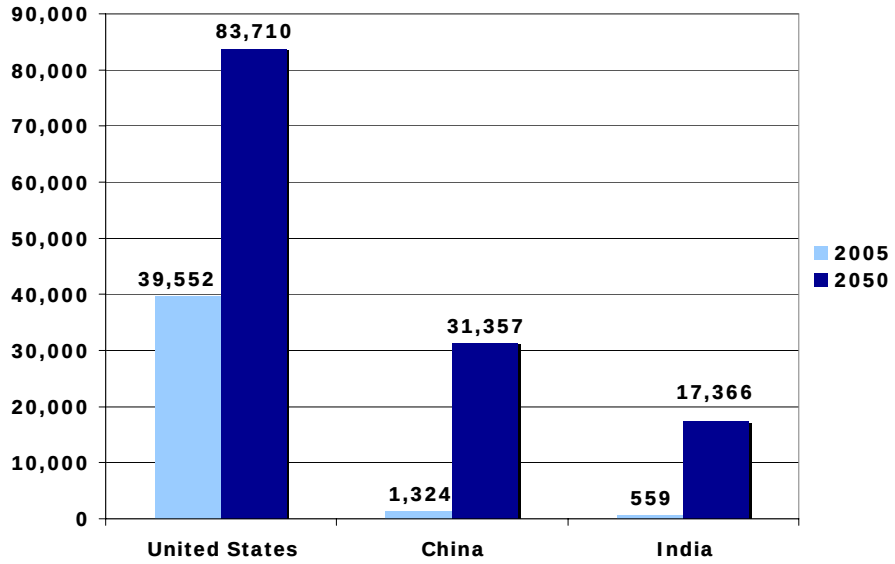
Goldman Sachs projects that by 2050 the China will have a Gross Domestic Product of $44 trillion and India's GDP will be $28 trillion. China's economy is projected to be larger than the projected size of the U.S. economy ($35 trillion), and India is projected to be not far behind. As you can see from the chart, phenomenal growth rates are projected for China and India, actually faster for India than China, where GDP is projected to increase 46 times over the current level in the next 44 years.

**Projected US$GDP in billions: 2005, 2050**

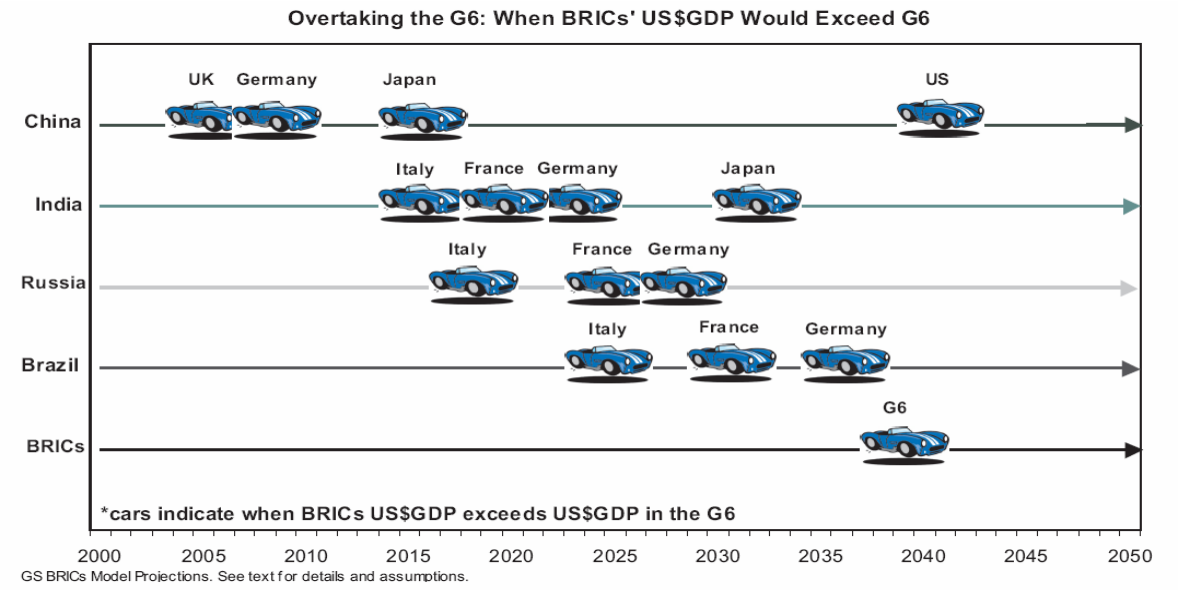



GDP per capita in the U.S. is projected still to be substantially higher than in China or India, but the relative advantage of the U.S. will shrink substantially. Today GDP per capita in the U.S. is 30 times larger than GDP/capita in China and 70 times larger than GDP/capita in India. By 2050 Goldman Sachs projects the U.S. advantage will shrink to 2.7 : 1 over China and 4.8 : 1 over India.

**Projected US$GDP Per Capita: 2005, 2050**



This chart is a little difficult to read, but it illustrates the year when the economy of Brazil, Russia, India, and China each are projected to surpass the size of the economy of individual G-6 nations. The economy of China is already larger than that of France and Italy, it is projected to be larger than the economy of the UK, Germany, and Japan by 2015, and larger than the U.S. by 2040.




The GDP of India is projected to be larger than the GDP of Italy, France, and Germany by 2025, and larger than the GDP of Japan by 2035.

Russia is projected to be larger than Italy, France, and Germany by 2030, and Brazil is projected to be larger than each of these three nations by 2040.

Together, by 2040 the aggregated economies of Brazil, Russia, India, and China (BRIC) are projected to be larger than the aggregated economies of the G-6, the U.S., U.K. France, Germany, Japan, and Italy. Of course, the economies of many countries not on this list will also be growing rapidly during the next 45 years.

*(Source for economic projections: Goldman Sachs, cited in a presentation by Anthony Carnevale, American Association of Colleges and Universities, January 26, 2006.)*

**The imperative for "mass" higher education**

The situation of the United States in the context of other developed economies illustrates the global trend toward mass higher education. Every country is different in some respects, but the differences among countries are about starting points, not about long term goals or the fundamental challenges facing higher education. Sooner or later, every nation will face the need for mass higher education which is now quite apparent in the United States.

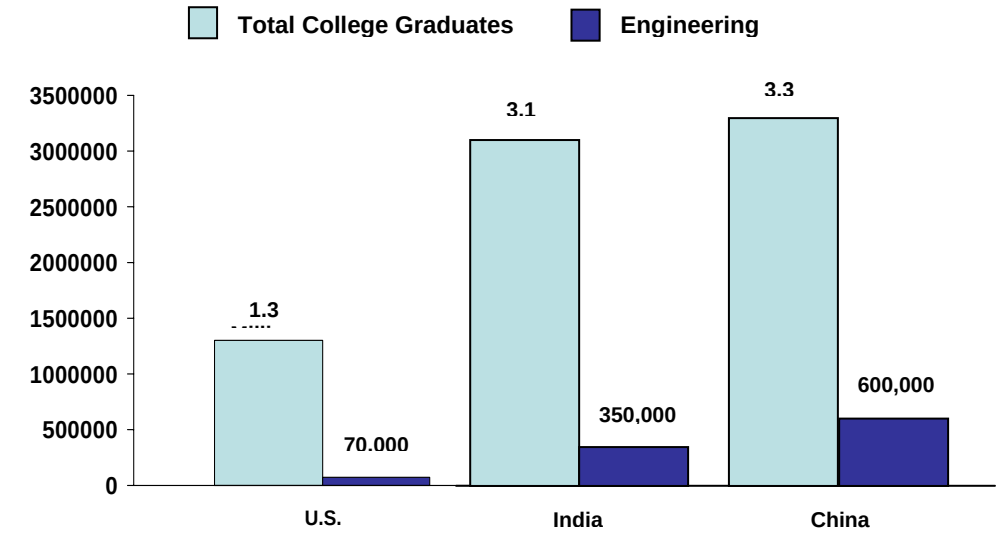
Last summer Geoffrey Colvin, a writer for Fortune observed that workers in the United States and Western Europe are now the most expensive in the world. Because business can now meet many needs by outsourcing and offshoring, expensive workers must find a way to be worth what they cost. For the U.S. this challenge is clear; to maintain its standard of living, the people of the United States must be among the best educated workers in the world.

Why is this essential? Capital is speeding around the globe looking for cheaper labor, and lower-cost workers around the world are acquiring more knowledge and skill. Manufacturing now accounts for about 15% of jobs in the United States, and its share of employment has shrunk more or less continuously for decades. While some components of the rapidly growing services sector (nursing, for example) are place bound, entrepreneurs have ingeniously discovered ways of providing a surprising range of services remotely. Using the telephone, technicians in India have helped me repair the wireless card on my computer. Other Indian professionals provide legal services and interpret X-rays for clients in the U.S.

After World War II the U.S. discovered a powerful "recipe" for social and economic prosperity: "Combine a well-educated workforce with investment in R & D, marinate in a competitive, market economy, governed by fair laws, and stir gently, but continuously."

The first essential ingredient is a "well-educated workforce," and U.S. educators have frequently claimed to lead the world's finest system of higher education. Until recently most indicators supported the claim. The leading U.S. research universities were (and still are) global leaders, and the U.S. ***has*** had the world's most educated workforce and the world's highest participation rate in higher education.

But in the past 10 years a good many nations in Europe and Asia have approached or surpassed the U.S. in educational attainment for young people under the age of 35. And while the rate of participation in India and China is far below that in the U.S., the numbers of college-educated workers (and engineers) in those countries far exceeds the U.S. total.




*Source: Geoffrey Colvin, Fortune Magazine, July 20, 2005*

I recently heard a talk by Yang Jin, Deputy-Director General in the Department of Basic Education in the Ministry of Education for the People's Republic of China. I was struck by both the ambition of China's education plans and the sophistication of his thinking about what is required for achieving their goals.

His data show China has nearly achieved a 20% participation rate of young adults in higher education. China's ambition is to achieve 100% education through the high school level by 2020. To achieve more widespread educational attainment, he said China is:

- Making instruction more student centered rather than teacher centered;
- Focusing on creative thinking. individual differences, students with learning difficulties, and value-added instruction; and
- Making teacher professional development a high priority.

**China's Education System – 2004**

| | No. of schools | No. of teaching staff | No. of students | Gross rate of enrollment |
|---|---|---|---|---|
| Higher ed. | 3,423 | 970,506 | 18,352,821 | 19% |
| High school ed. | 31,493 | 1,920,894 | 36,076,284 | 47.6% |
| Middle school ed. | 63,757 | 3,500,464 | 65,762,936 | 94.1% |
| Primary ed. | 394,183 | 5,628,860 | 112,462,256 | 106.6% |
| Pre-schooling ed. | 117,899 | 656,083 | 20,894,002 | 40.8% |

In the United States the decreasing value of a high school education has motivated youth to increase their educational aspirations. Of high school sophomores 80% say they plan to obtain a baccalaureate degree and 40% aspire to a graduate or professional degree.

But the two fastest growing groups in the U.S. population (Latinos and African-Americans) have substantially lower participation and success rates in higher education. Closing these participation and achievement gaps is a national imperative, and an enormous challenge, especially in the context of other economic and social challenges facing the U.S. We need better educational and finance policies to improve preparation and remove financial barriers for low-income students, and we need to find ways of improving instruction and reducing the cost of delivering higher education. Without productivity improvements in higher education the U.S. will fall far short of needed gains in educational attainment.

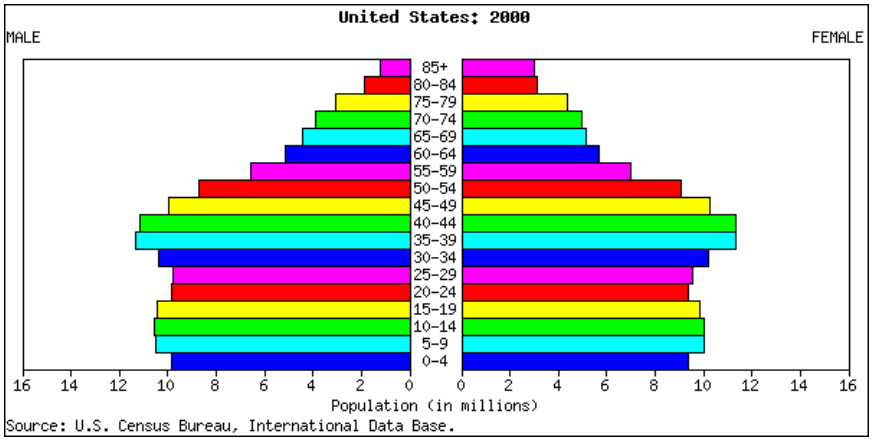
I'm sure most other nations represented here wish they could face these educational challenges with the resources available in the United States. This is not a call for sympathy. But it is important to recognize that, despite different starting points, ***every nation*** must increase successful participation in higher education to be competitive in the world economy.

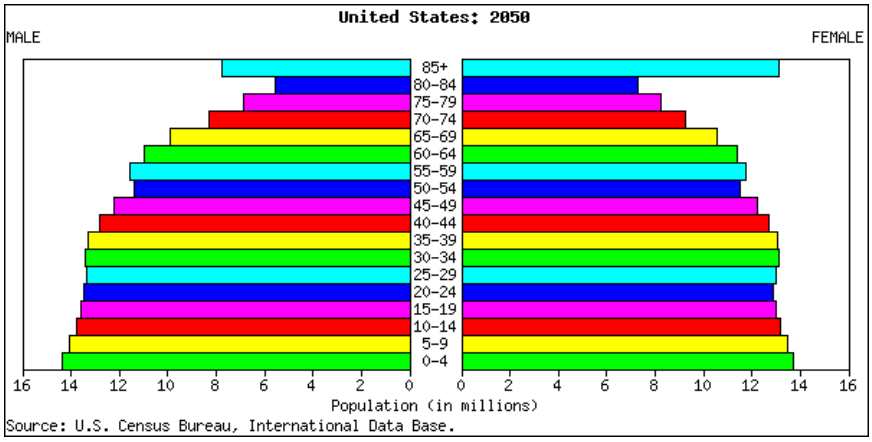
**Growing stress on world ecosystems**

For decades a public argument has been raging about the impact of human population growth on the world environment. In brief, these are the population numbers:

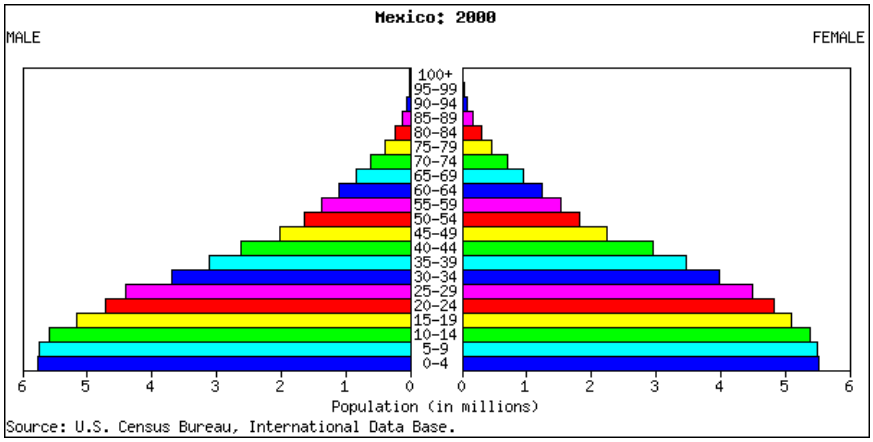
- 1800, one billion people
- 1927, two billion people
- 1999, six billion people
- 2050, nine billion people.

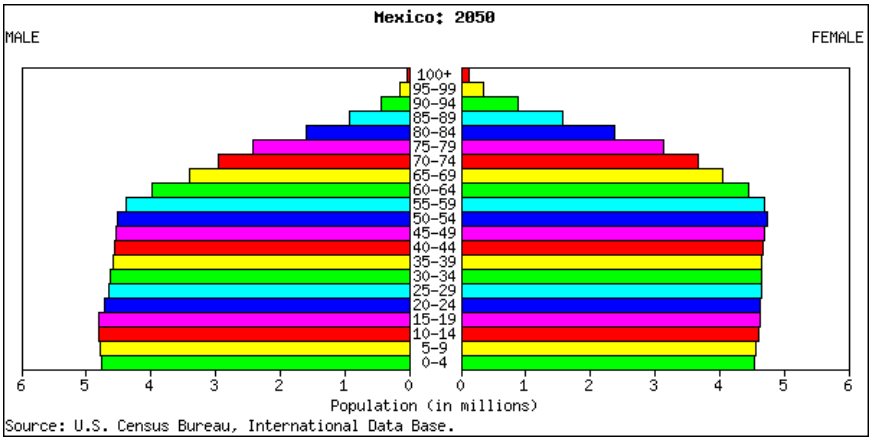
Let me take a brief detour from my main point and show you the population age distributions for the U.S. and Mexico in the years 2000, 2025, and 2050. The U.S. is already an older society, and we will become more so in the next 50 years. Our most significant problem is financing the retirement incomes and health care of my generation with a work force that is not growing.



Mexico, by contrast is now a very young society with many young people to be educated. But Mexico's birth rate is projected to slow down, and its population also will become comparatively older in the coming years. Interestingly, both the U.S. and Mexico are projected to grow at the same rate between 2000 and 2050, about 48%, roughly the rate for the total world population.




Let's return to the big picture. By 2050 the human population of the planet will have increased 900% in 250 years. 250 years seems like a lot of time to me, but in the span of geologic time it is a blink of the eye. It is hard to believe this can happen without environmental consequences.

What are the consequences of this growth? The opposite poles of pessimism and optimism are epitomized by conservation biologist Paul Ehrlich, and the late business economist Julian Simon.

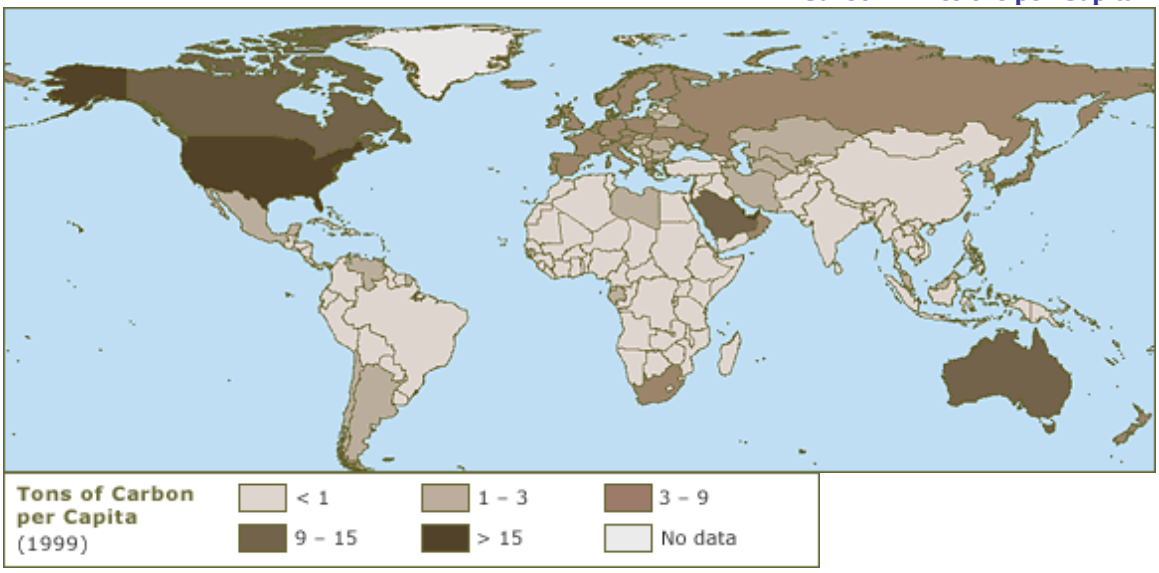
Thirty-eight years ago, in his book *The Population Bomb*, Ehrlich warned of depletion and damage to finite, fragile natural resources and predicted population growth would soon lead to mass starvation. Julian Simon became famous by disputing Ehrlich's projections, arguing that human ingenuity can and will cope with all natural challenges.

On the question of food supply, thus far at least, the optimists seem to have gotten the better of the debate. The “Green Revolution” dramatically increased food production, and Ehrlich’s 1968 projections have not come true. The world has experienced starvation, but economic inequality and war have been more important causes than shortages in the food supply.

With all due respect for human ingenuity, in my view unbridled optimism about the future is foolish and irresponsible. Desirable, perhaps inevitable economic growth, combined with the certain increases in the world’s population, have serious implications for the quality and sustainability of human life. Let me illustrate with a few pictures from the World Resources Institute, based in Washington, D.C.

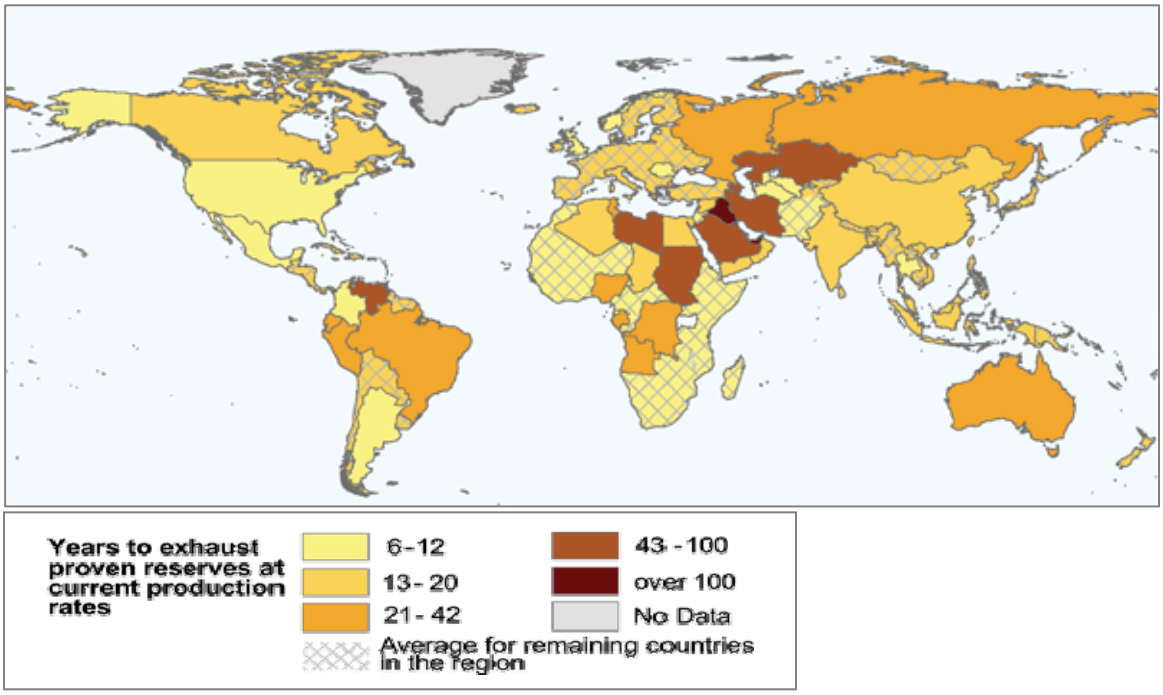
The picture below displays the current carbon emissions per capita in the world, a recognized cause of global warming. In 1999 the U.S. was the world leader with greater than 15 tons of carbon emissions per capita, followed by Canada and Australia with 9-15 tons per capita, and Europe with 3-9 tons per capita. Brazil, India, and China all had less than 1 ton of carbon emissions per capita in 1999. Now recall the projected economic growth rates for Brazil, India, and China, and imagine the effects on world carbon emissions when people in these and other advancing countries model the behavior of more developed countries by driving more automobiles and generating greater amounts of electricity.

**Carbon Emissions per Capita**



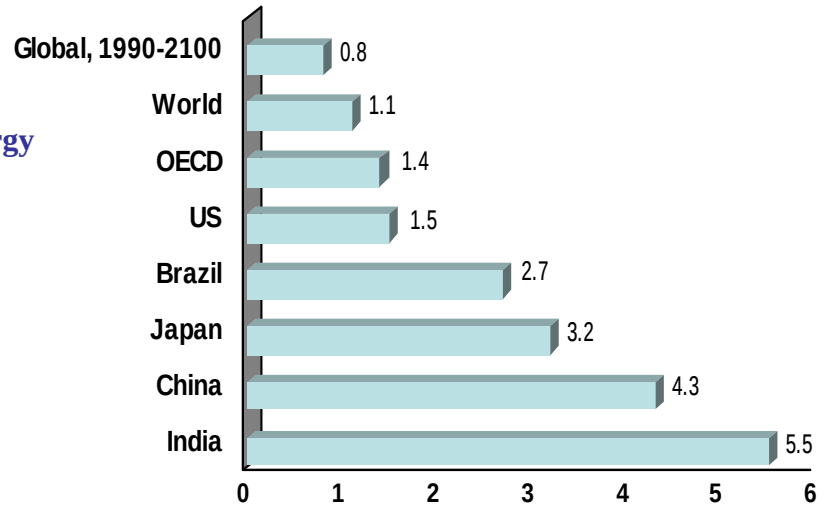
The next picture, generated by WRI from an analysis by BP Global, displays the number of years it will take to exhaust current known reserves of oil *at current production rates*. By 2050, only Venezuela and a few African and middle-eastern countries are likely still to be producing oil from known reserves. Only Saudi Arabia has reserves that can endure past 2100. While I have not seen any long-term projections that take into account economic growth, I imagine that, without significant increases in energy efficiency, current production rates will be inadequate to meet demand, and the reserves will be depleted even faster.

**Oil Supply/Consumption**



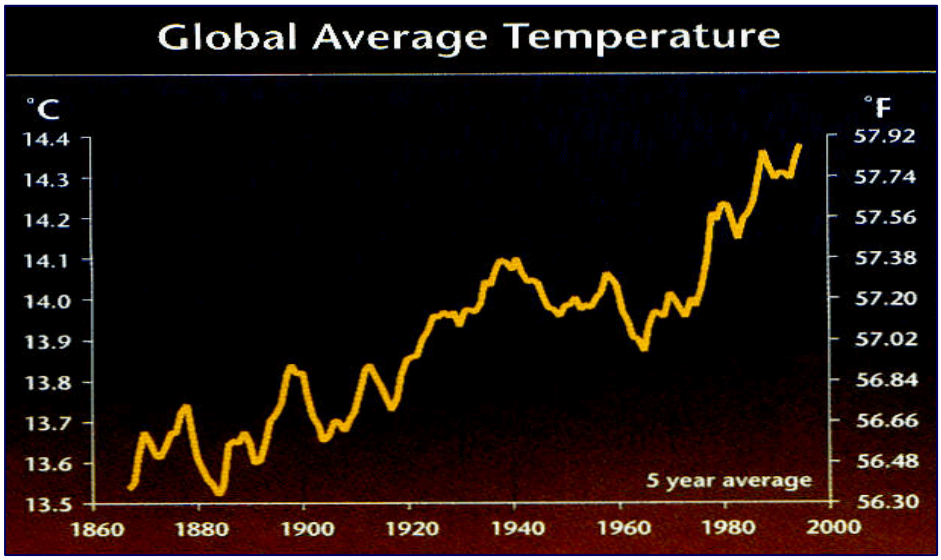
This next chart shows the annual rate of growth in energy consumption from 1987-1996 for a number of countries. Note that the fastest growth rates are in China and India, and the total annual growth *during this period* was 1.1 percent. Reducing the annual growth in energy consumption to 0.8% is necessary to avoid serious consequences, according to Jonathan Lash, President of the World Resources Institute, but *it will take a 40% reduction in projected energy consumption to reach a growth rate of 0.8%*.

**Recent Annual Energy Growth Rates (1987-1996)**



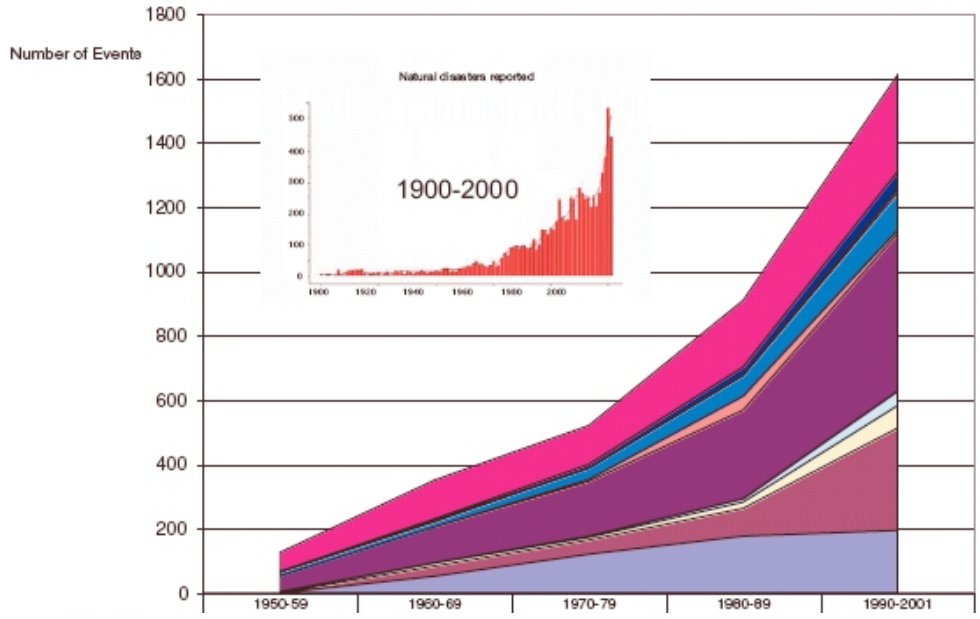

Does all this really matter? Let me share a few charts I find persuasive.

The picture below shows the average global temperature for the past 140 years. After 1000 years of stability (not shown on the chart), the average global temperature has increased about 1%, from 13.5 to 14.4 Celsius from 1860 to 2000. The fifteen warmest years over the past 100 years of direct measurement have occurred since 1980. The Intergovernmental Panel on Climate Change projects further temperature increases ranging from 1.5 C to 5.7 C, depending on human action to reduce emissions.



This next chart shows the frequency of weather related disasters from 1950 to 2000. Let me list the categories in fine print: Wind storm, wild fire, wave surge, slide, insect infestation, flood, famine, extreme temperature, epidemic, and drought. From 1950 to 1959 the earth recorded fewer than 200 of such disasters. From 1990 to 2001 we experienced 1600 such events. Jonathan Lash argues that the growth in these events is the consequence of 1 degree Celsius global warming.

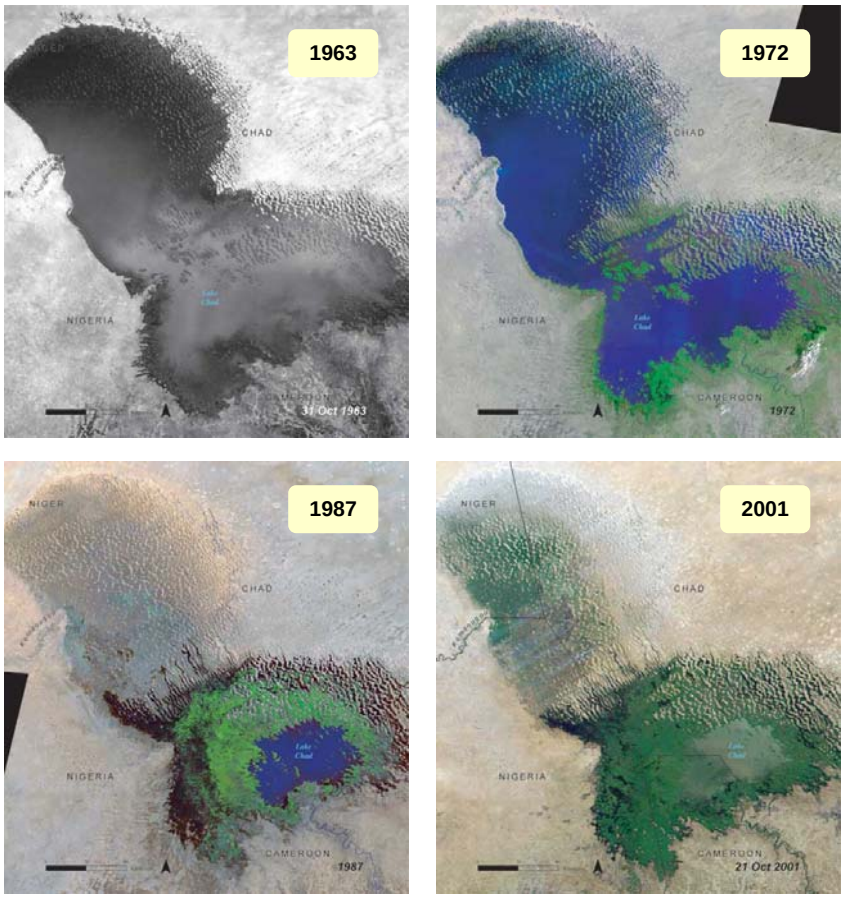
## The Frequency of Weather-Related Disasters




| | 1950-59 | 1960-69 | 1970-79 | 1980-89 | 1990-2001 |
|---|---|---|---|---|---|
| Wind storm | 59 | 121 | 121 | 207 | 300 |
| Wild fire | 0 | 4 | 11 | 25 | 54 |
| Wave/surge | 2 | 5 | 2 | 3 | 12 |
| Slide | 11 | 15 | 34 | 63 | 114 |
| Insect infestation | 0 | 1 | 6 | 43 | 13 |
| Flood | 50 | 110 | 170 | 276 | 489 |
| Famine | 0 | 2 | 4 | 11 | 45 |
| Extreme temp | 4 | 10 | 9 | 19 | 70 |
| Epidemic | 0 | 31 | 44 | 86 | 317 |
| Drought | 0 | 52 | 120 | 177 | 195 |

Here is an aerial photo of a well-known wind storm, Hurricane Katrina approaching New Orleans, and the effects on the city of the subsequent flooding.

Here is an example of sustained drought attributed to global warming, the shrinking of Lake Chad in Africa. In 1960 Lake Chad was the 6th largest lake on earth. These photos were taken in 1963, 1972, 1987, and 2001. During this period Lake Chad shrank by 95%.




These final photos are close-ups of the lake today.

Accelerating economic growth in developing countries is an important factor in this global problem. Without question, however, *the greatest opportunities and obligations for conservation lie in the United States, Europe, and other prosperous nations who currently have the highest levels of energy consumption on earth.*

These nations consume more, and they have a disproportionate share of the research and technical capacities required to invent more energy efficient technologies and the means of bringing the use of renewable energy resources to scale. Higher education must lead in the research and development necessary to meet these goals. Higher education must lead in informing the public of the problems and issues. We also must lead in incorporating state of the art technologies in our buildings and energy consumption practices.

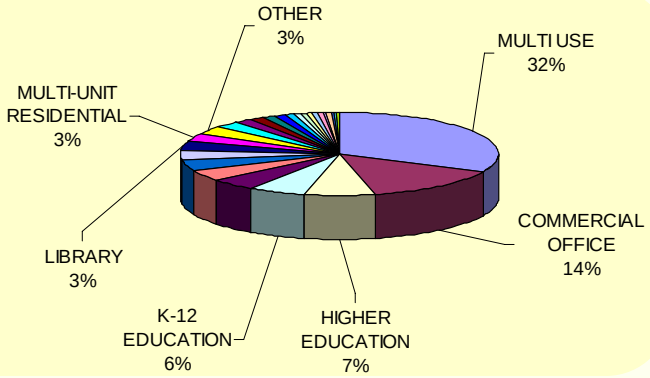
Let me conclude by commending to you the LEED (Leadership in Energy and Environmental Design) standards developed by the U.S. Green Building Council (www.usgbc.org). The next charts outline the purposes and topics addressed by the LEED standards and show you a few buildings meeting them.

## Leadership in Energy and Environmental Design (LEED)

**Purpose: to transform the building market by promoting sustainable pro-environmental design and standardized building practices that will in turn raise consumer awareness on the benefits of "green" buildings.**

**New construction market transformation:**

**Registered buildings by type as of 10/2005**




## LEED upholds standards for different types of construction, including new and existing construction, and homes and neighborhoods:

**Picking a sustainable site:** picking appropriate sites for development, availability of alternative transportation, protect/preserve habitat

**Water efficiency:** efficiency of fixtures, reusability of rainwater

**Energy and atmosphere:** low-energy use appliances, high standard insulation & air tightness, energy efficient lighting, incorporation of renewable sources

**Materials and resources:** specific percentage of recycled content in the construction materials, reduce total amount of materials, manage waste

**Indoor environment quality:** good air quality, low-emitting materials indoors (paints, carpet, sealants), incorporate thermal and light control, use of natural light

**Innovation and design process:** recognize innovation in design



Many of you may be more familiar with this organization than I, but I didn't want to pass up an opportunity to encourage you to make your own professional contributions to this important international priority. Muchas Gracias.