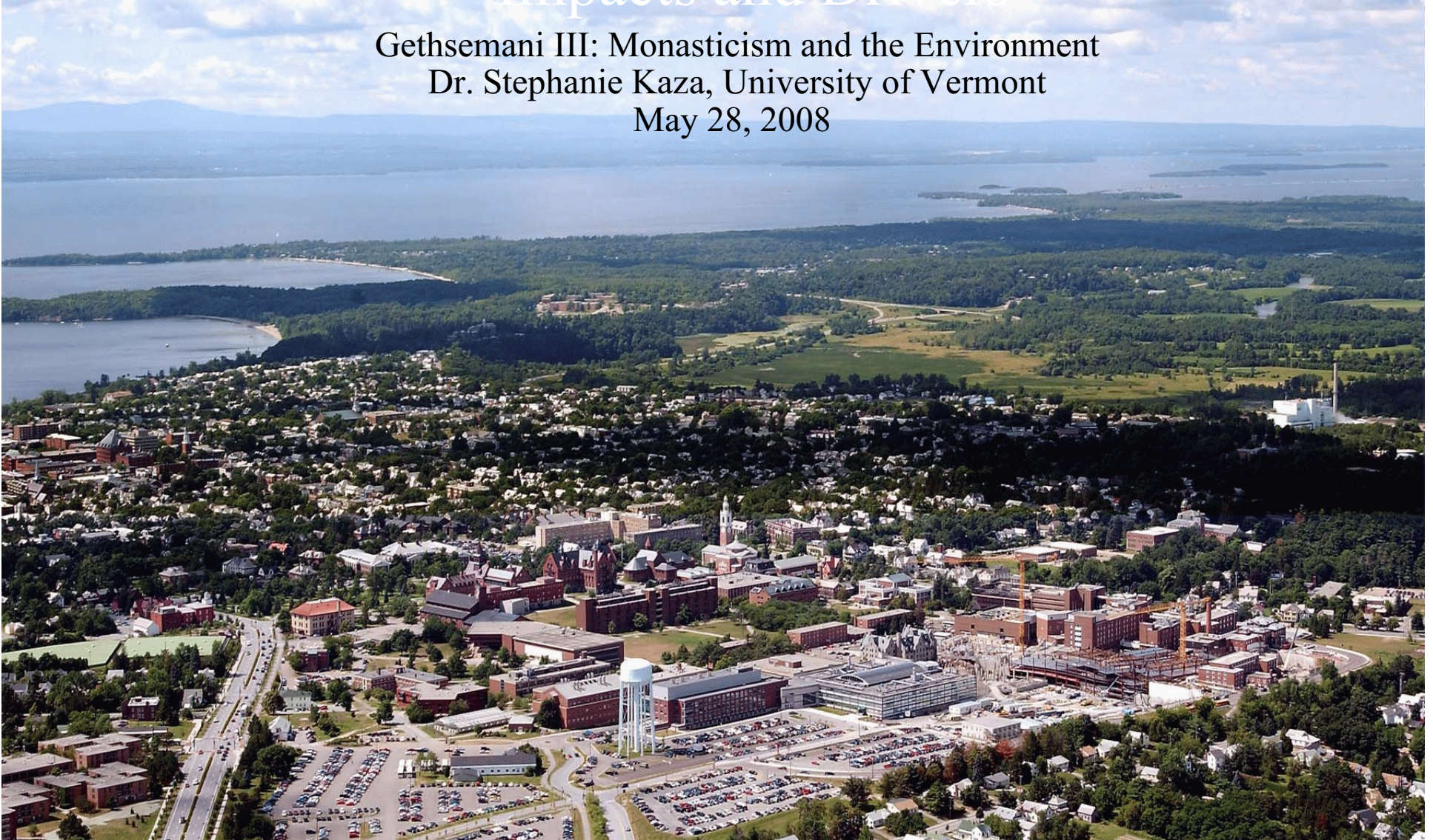




Gethsemani III: Monasticism and the Environment  
Dr. Stephanie Kaza, University of Vermont  
May 28, 2008







## **Context**

Global environmental crisis: species and habitat loss, increasing human populations, basic resources compromised

Increasing scope and impact of new technologies

Rapid rise of consumerist economies in China, India, SE Asia

Oil- based global economy under threat

Widespread impacts of climate change

## **Science and Environmental Problem-solving**

Tracking trends in environmental conditions

Applying integrated ecosystems understanding

Modeling systems dynamics

Working in global teams to pool data

Publishing peer-reviewed research



### **In the 20th century:**

Population quadrupled

World economic output increased 20-fold

Energy use increased 16-fold

- More energy consumed in last century than all of previous history

Enormous gains in health, education, standard of living but at great cost to environmental health

New risks from chemical and nuclear industries, hazardous waste, pesticides

Grave loss to world's natural resource base

- 1/3 to 1/2 of world's forests are now gone
- 75% marine fisheries fished to capacity or overfished
- 1/4 of all bird species are extinct, 12% threatened
- 1/4 mammal, reptile and fish species threatened



**In the last 20 years:**

Global population up 35%

World economic output up 75%

Global energy use up 40%

Global meat consumption up 70%

World auto production up 45%

Global paper use up 90%

Advertising globally up 100%

***Gus Speth, Dean of Yale School of Forestry and Environmental Studies***

*“Humans dominate the planet today as never before. We have entered the endgame in our traditional, historical relationship with the natural world... Whatever slack nature once cut us is gone.*

*-- Red Sky at Morning: America and the Crisis of the Global Environment (2004)*



**Ecologist Jane Lubchenco, 1998 address to AAAS:**

*“The conclusions ... are inescapable: during the last few decades, humans have emerged as a new force of nature. We are modifying physical, chemical, and biological systems in new ways, at faster rates, and over larger spatial scales than ever recorded on Earth. Humans have unwittingly embarked upon a grand experiment with our planet., The outcome of this experiment is unknown, but has profound implications for all of life on Earth.”*





### **Water**

1/5 of world's people lack clean drinking water

40% lack sanitation and sewage services

Between 1970 and 1990, water supply per person dropped by 1/3 globally

### **Food**

Food riots in Haiti, Southeast Asia

Shrinking world grain reserves; food hoarding and speculation

Increasing energy intensity of food production

Concentration of agribusiness in powerful global corporations

### **Toxins and Disease**

Warming conditions invite disease transmission

Accumulating pesticides and hormone disrupters in food chain

### **Climate**

Global carbon emissions continue to rise despite reduction efforts

Political agreements do not yet agree on targets for all

Extreme weather events tax infrastructure capacities



## 1) Land Conversion and Degradation

Draining and filling of wetlands (1/2 now lost)

Conversion of tropical forests to agriculture (1/3 now gone)

Urbanization and sprawl

Desertification, overgrazing

Encroaching deserts  
in China



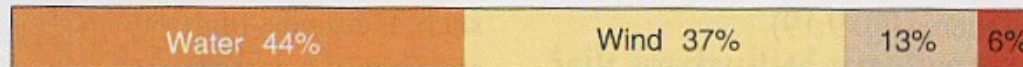




## 1) Land Conversion and Degradation

Map p196

Soil degradation types







## **2) Freshwater shortages**

Loss of river and stream habitat

Increased water diversion for agriculture, urban, industrial use

Rivers no longer reach the sea:  
Colorado, Ganges, Nile, Yellow

Dams on 60% of world's major river  
basins



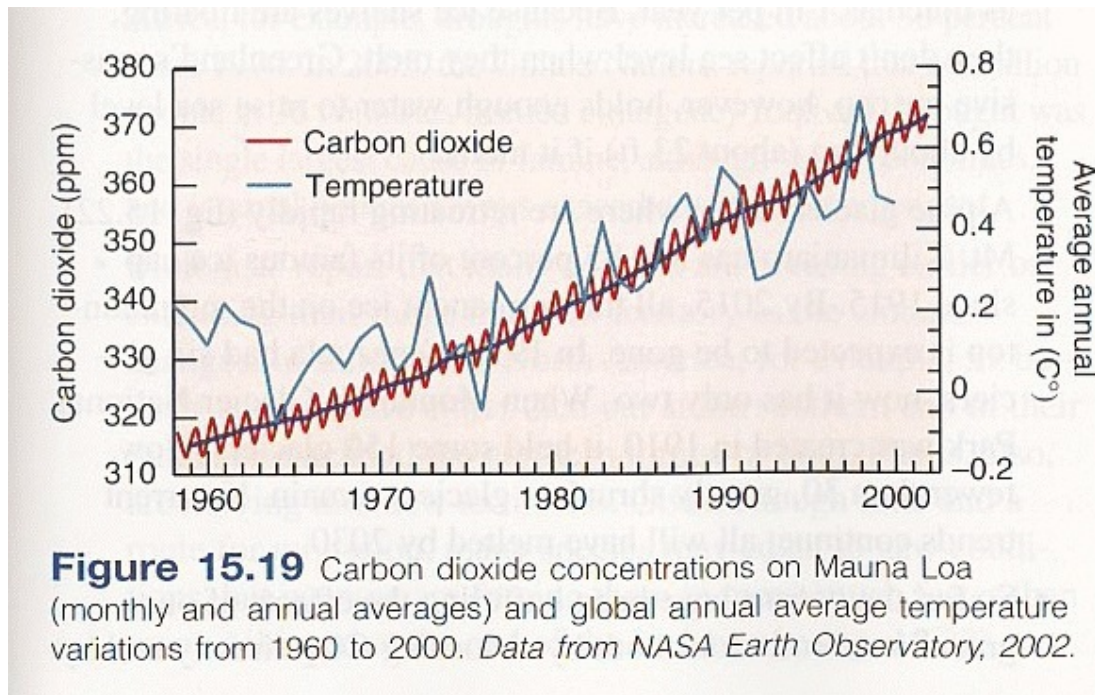
### 3) Climate change

Atmospheric warming causing polar ice melt, coral reef bleaching

More extreme weather events -- cyclones, hurricanes, droughts

Ozone depletion means more UV radiation reaching earth

Greenhouse effect increasing from rising carbon emissions







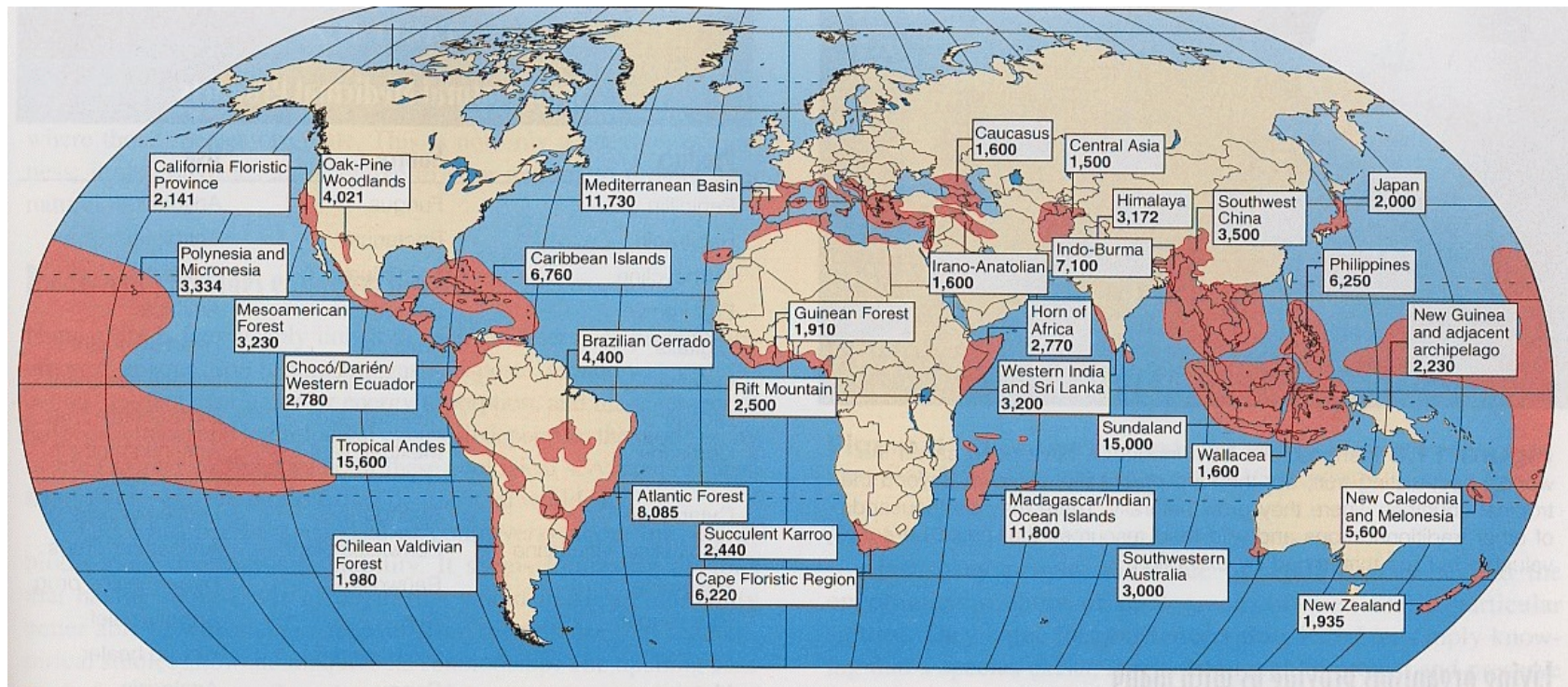
#### 4) Overharvesting of resources

Marine fisheries seriously impacted: cod, bluefin tuna, halibut, salmon

Deforestation, habitat fragmentation

- Between 1960 and 1990, 20% of tropical forest lost
- In U.S., 95% original forests cleared, 99% tallgrass prairie transformed

Sixth great wave of extinction unfolding(Biodiversity Hotspots)







## **5) Energy intensive production**

Acceleration of fossil fuel use

Approaching “peak oil”

Nuclear waste hazards

Resource wars for energy

Rising economies in China,

India accelerating fuel use





## **6) Human Population Increase**

Urbanization

Migration to leave war-torn or environmentally degraded areas

Increase in solid and hazardous waste

Plastics pollution, explosion in volume of e-waste





## Threats to Human Health

### 1) Multiple Environmental Toxins

Mercury, lead, other heavy metals

Pesticides, chemical exposure

Endocrine disruptors

Plastics ingestion







## **2) Air and Water Pollution**

Asthma from multiple triggers

Skin cancer from high levels of UV light

Diarrhea, water-borne pathogens

E. coli, bacterial disease

Drug pollution -- birth control pills,  
anti-depressants



### 3) Emerging Diseases

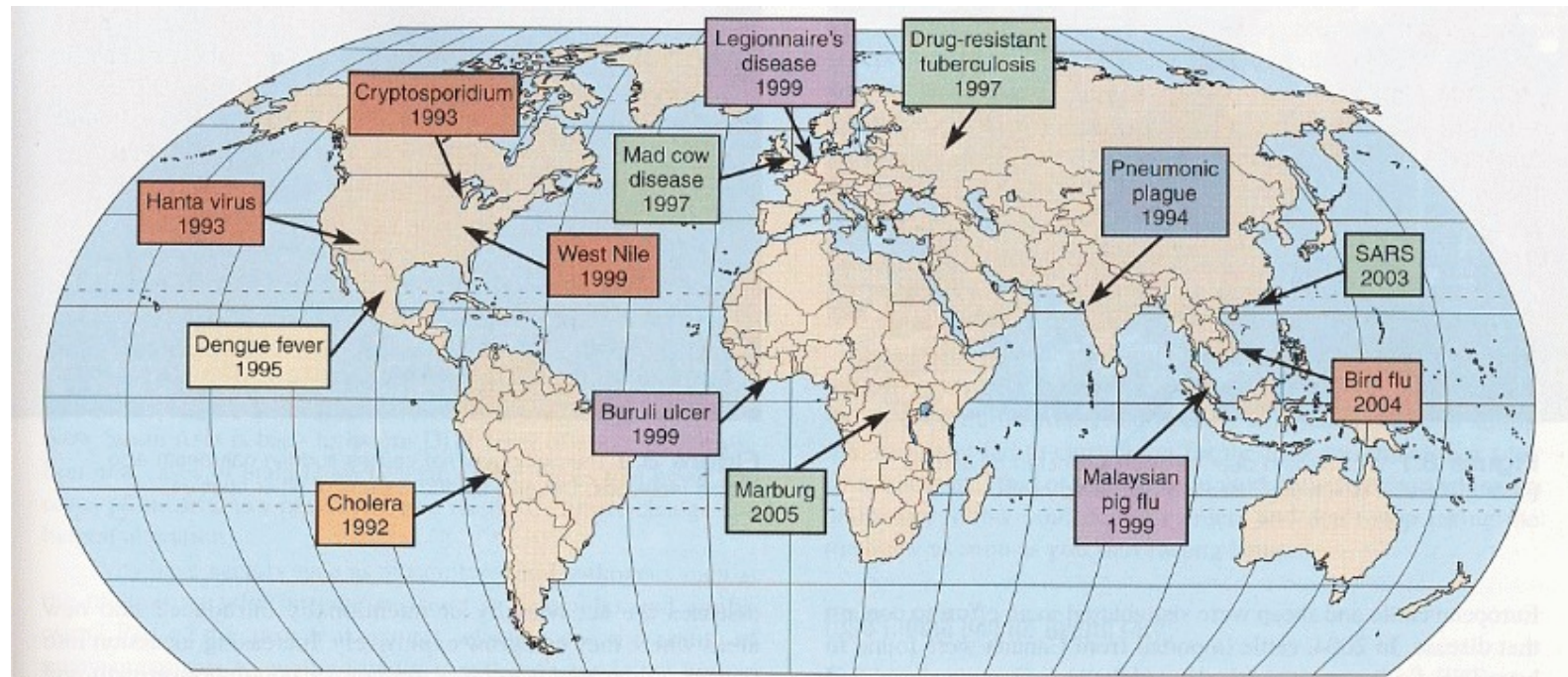
AIDS, HIV (20 million dead, 34-46 million sick)

Rapid evolution of pathogens -- SARS, Ebola, avian flu

Climate warming spread -- West Nile virus

Obesity epidemic in developed countries

Drug-resistance in old diseases: tuberculosis, pneumonia





#### **4) Solid and Hazardous Waste**

Uncollected trash in mega-cities

Plastics debris gyre in North Pacific

E-waste toxic trade in China, Africa

Metals leaching into water table

Unregulated nuclear waste in places





## **5) War**

Environmental impacts of war -- scorched earth strategies, bombing raids

Military spending takes from basic human needs

Refugees increase local environmental impact

Conflicts over natural resources fuel instability



**Ecological Footprint** = the load imposed by a given population on nature or the land area necessary to sustain current levels of consumption and waste discharge  
Ecological shadow = the hidden ecological, economic, and moral costs to the environment of a policy, product, or pattern of consumption

**Who is doing the consuming?**

75% of Earth's biocapacity used by just five: China, India, Europe, Japan, U.S.

Total footprint per person and as share of global biocapacity:

China 1.6 hectares 18%

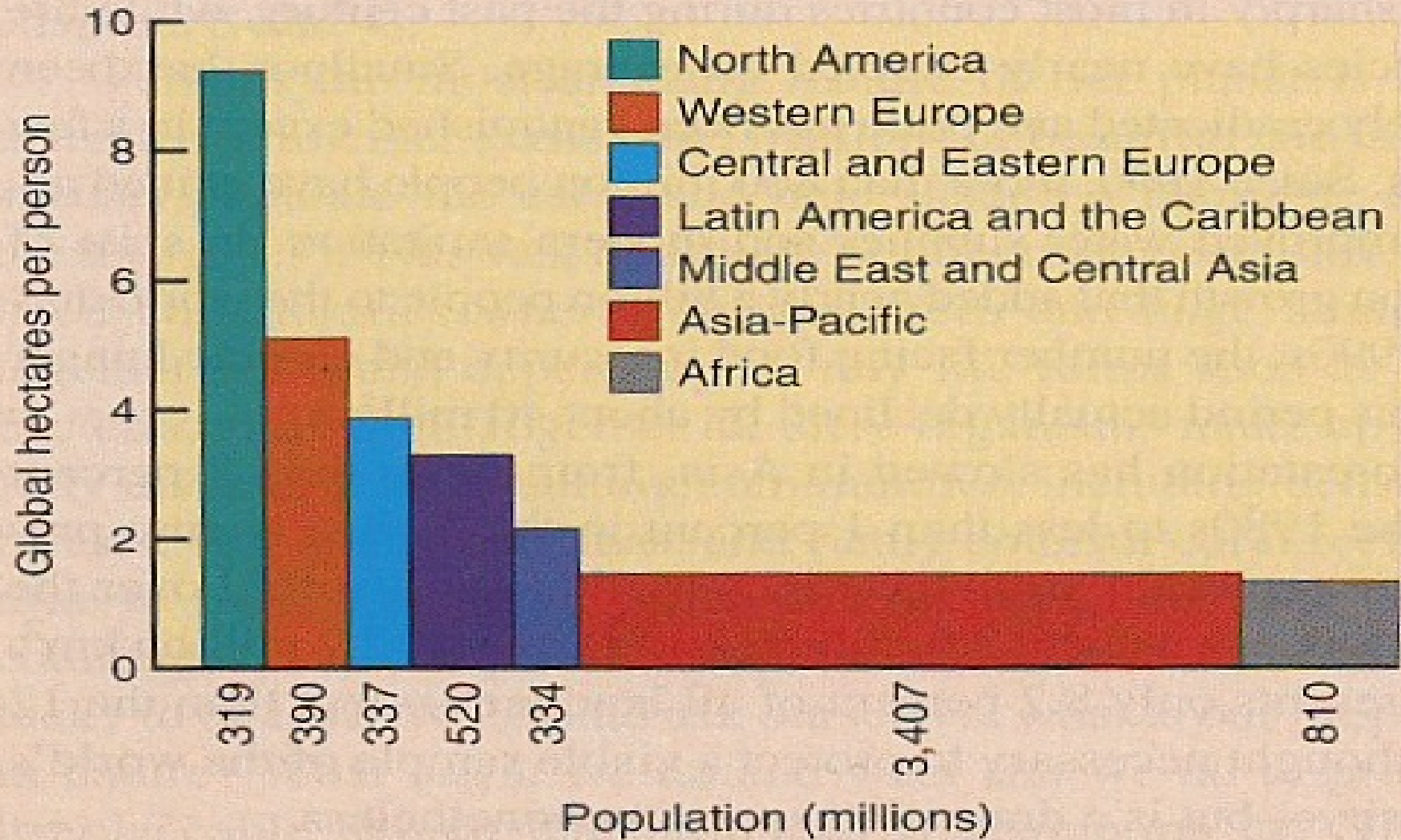
India 0.8 7%

Europe 4.7 19%

Japan 4.8 5%

United States 9.7 25%







**The United States is the biggest consuming nation,**

**TABLE 1.2**

**The United States, with 4.5 Percent of  
the World's Population . . .**

**Consumes**

26 percent of all oil  
24 percent of aluminum  
20 percent of copper  
19 percent of nickel  
13 percent of steel

**Produces**

50 percent of all toxic wastes  
26 percent of nitrogen oxides  
25 percent of sulfur oxides  
22 percent of chlorofluorocarbons  
26 percent of carbon dioxide

**but China and India are quickly catching up.**

*Source: World Resources Institute, 1998–99.*





### **Affluenza - a National Disease**

Americans constitute only 4.7% of the earth's people but produce 25% of greenhouse gas emissions.

Since 1950, we Americans have used more resources than everyone who ever lived on earth before then.

Americans spend more for trash bags than 90 of the world's 210 countries spend for everything.

Americans drive twice as much per capita as a half century ago and fly 25x as much.

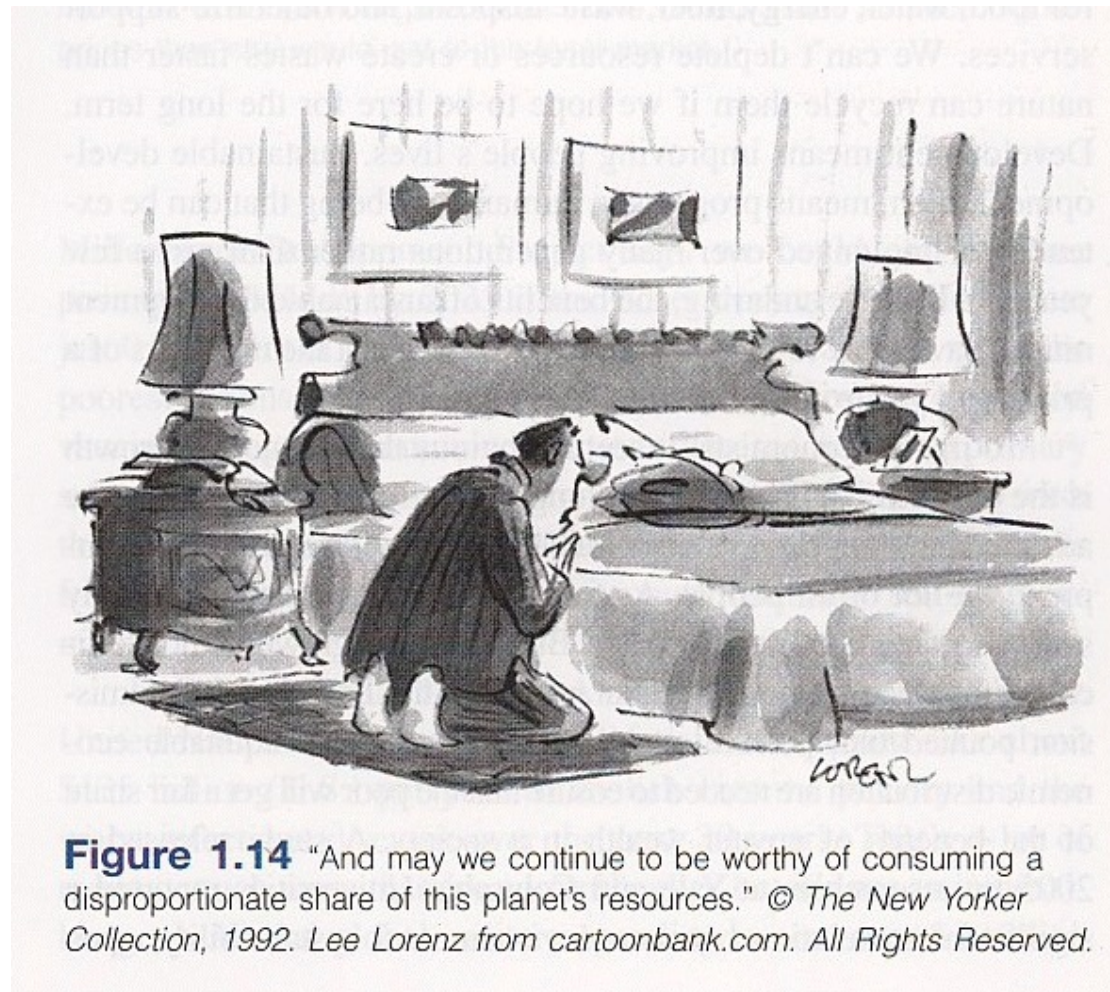
We have twice as many shopping centers as high schools.

America's 102 million households currently contain and consume more stuff than all other households throughout history, put together.

-- *Affluenza: The All-Consuming Epidemic*, John DeGraaf et al



## A religious perspective?





## **Environmental Impact determined by:**

$$\mathbf{I = PAT}$$

I = Impact

P = Population

A = Affluence (GDP per capita) or consumption

T = Technology (environmental impact per dollar of GDP)

## **Other influences:**

Poverty

Market failure

Policy and political failure

Scale and rate of economic growth

Cultural values

Forces of globalization





### **Population pressures: developing world**

High infant mortality keeps fertility rates high, need for family labor

Urban poor set up temporary shelter without sewage or garbage service

Struggles over needed resources contribute to violent conflicts

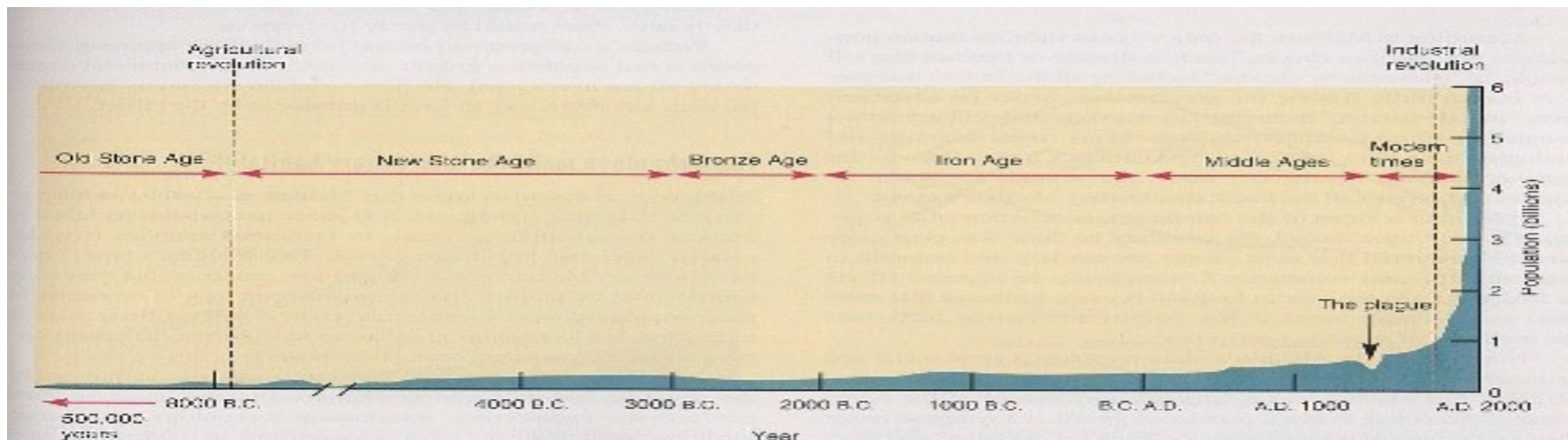
U.S. withholding of global family planning support limits women's options

### **Population pressures: developed world**

Increased traffic in single occupancy vehicles increases commutes, pollution

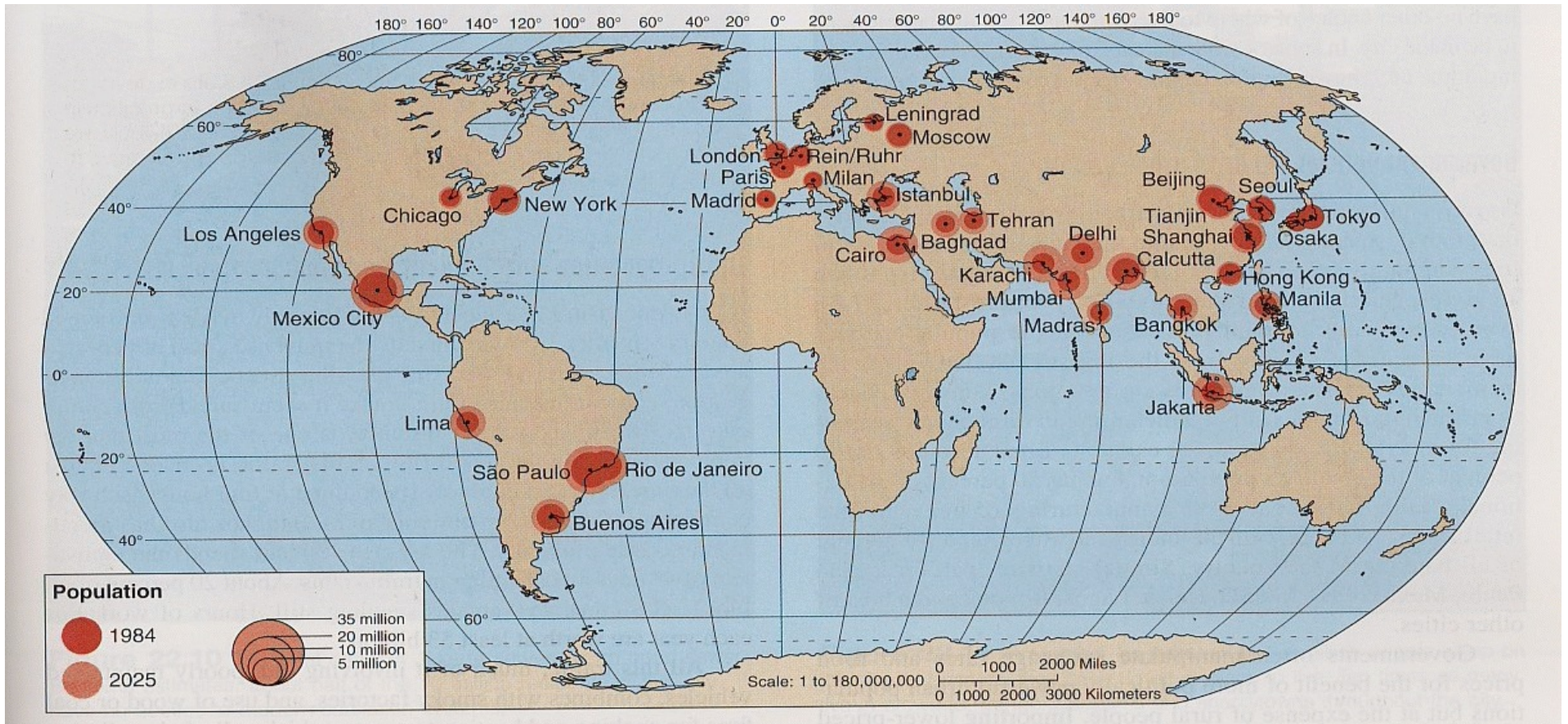
Suburban sprawl contributes to habitat fragmentation

Competition for jobs is challenging in an outsourcing economy





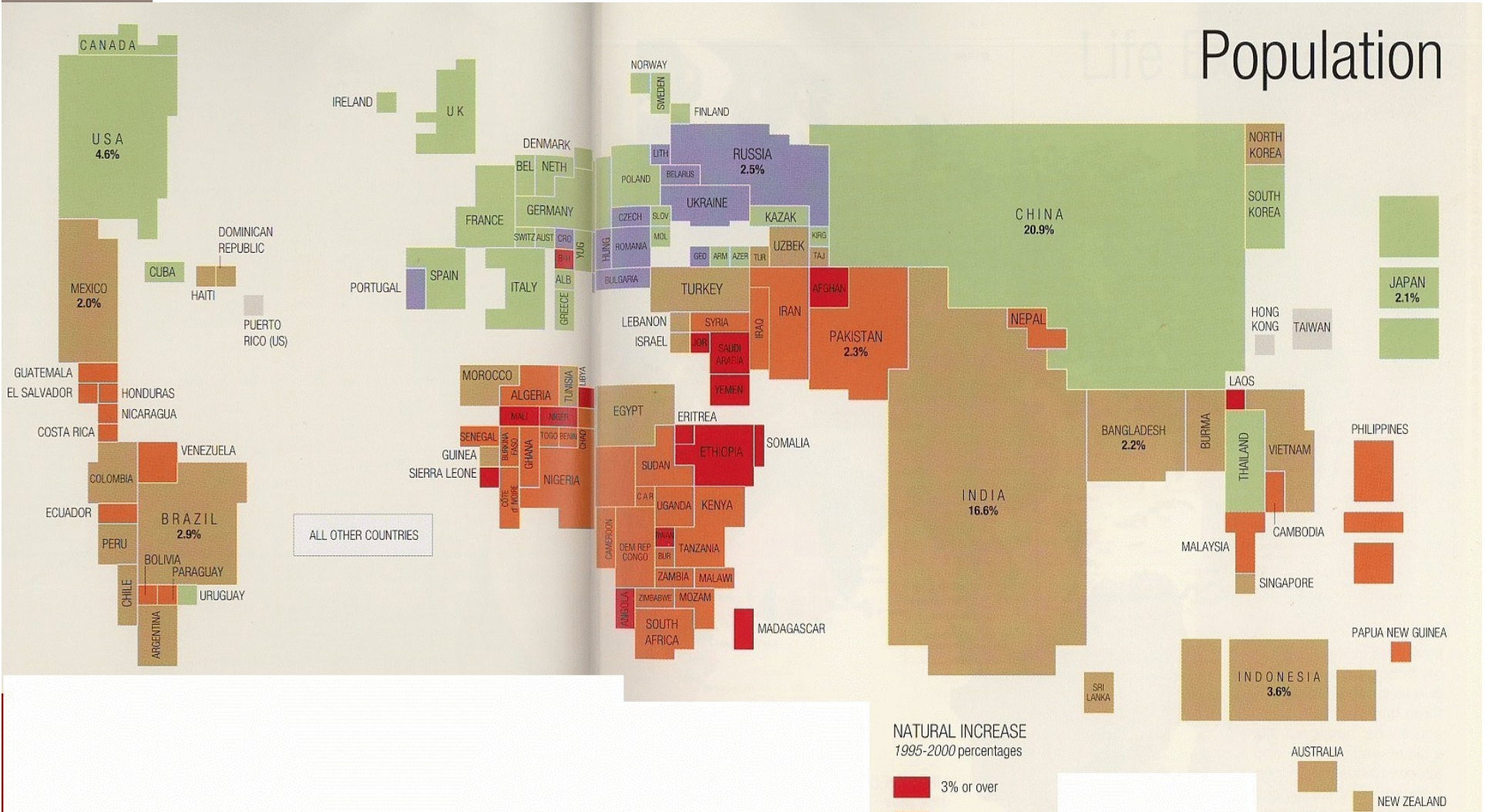
## World's Largest Cities-- projected growth







# Population







## **Consumption pressures: developing world**

### Hunger

- In 2005, UN reported that 815 million people suffer from hunger.
- Malnutrition is common where food security is low
- Cash crops for global economy replace subsistence crops
- Bush meat hunting impacts local wildlife

### Lack of access to drinking water and sanitation

- One in five have no access to clean drinking water
- Poor sanitation brings waterborne disease

### Poverty

- High rates of inflation impacting cost of basic goods
- Pursuit of wood and water ravages local habitats

## **Consumption pressures: developed world**

Increasing sprawl fragments communities

Perverse subsidies foster mega-growth

Cheap food imports set standard

Consuming = American way of life



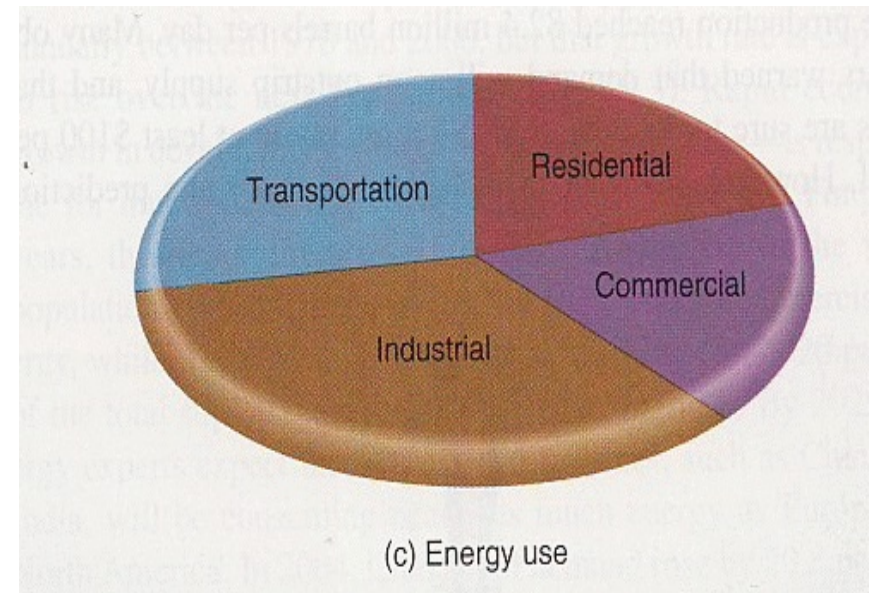
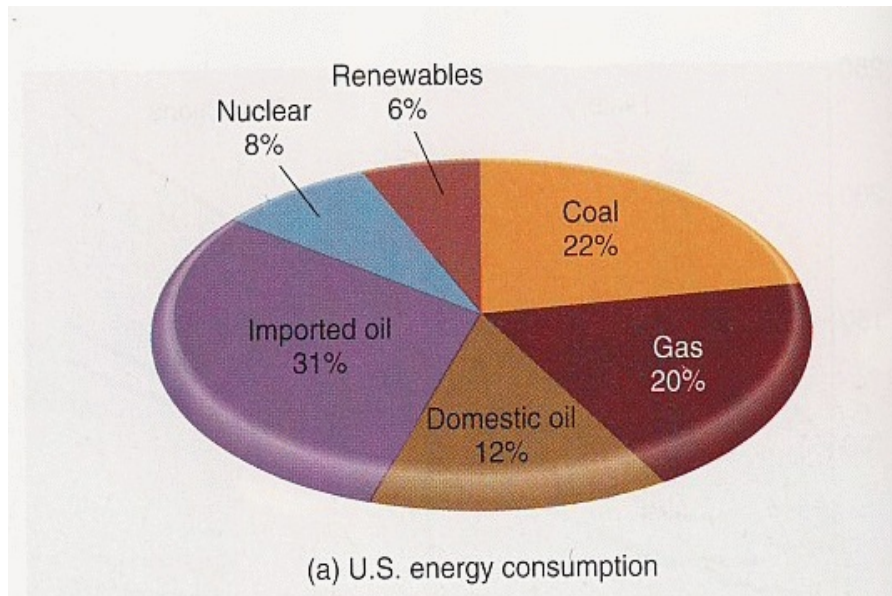
## Increasing energy use

U.S. the highest per capita user in world

Using 5x more energy than average citizen, 10x more than average Chinese, 20x more than average Indian

World's richest people use 25x more energy than poorest

Surging demand in China and India -- for industry, household, transportation





### **Technology: Developed World**

Profit driven exploitation drives technological advance

Cheap credit makes investment accessible

Efficiencies generate more resource exploitation

Environmental regulation determined by political attitudes

Significant reliance on fossil fuel support

### **Technology: Developing World**

Infrastructure technologies (sewage, public transportation) limited

Economic dependence on global market (ex. coffee)

Information poverty and computer literacy compared to North





### **Example: Coal-Bed Methane**

Shallow coal seams, cheaper to extract

Held in place by pressure from overlying aquifers

15-year supply in intermountain west

Drilling one well releases 75,000 liters

of water per day

Dumped water poisons fields, streams

12,000 wells installed, 39,000 proposed

Gas fields in antelope, elk migration

paths

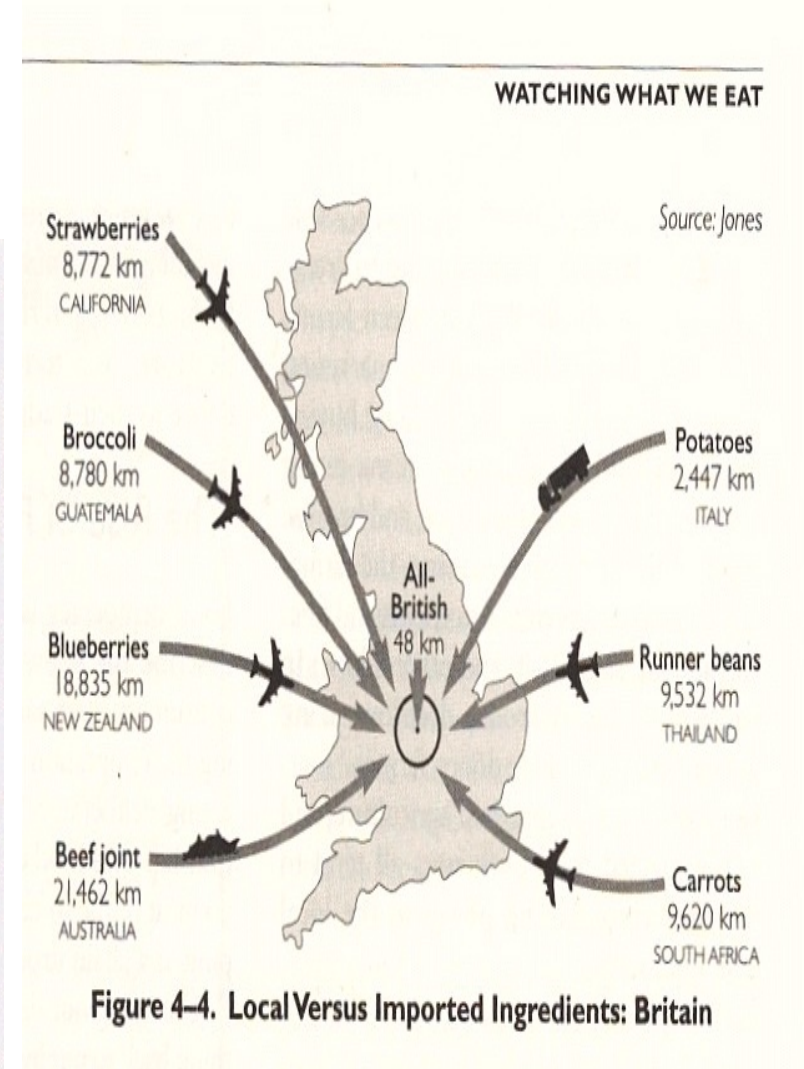
**At what price cheap energy?**





### Example: Factory farming for meat production

Global shipping for consumer tastes carries high carbon emissions costs







## Example: China's South-to-North Diversion Project

Goal: bring water to Beijing metropolis

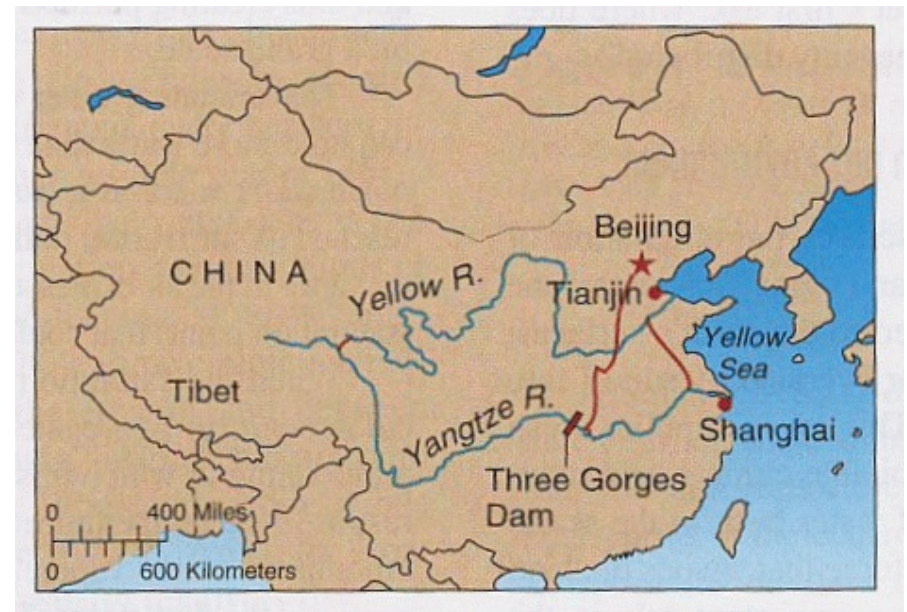
- Population of 13 million, fast-growing NE industrial region
- Yellow River already pumped dry, Yangtze River in south to be diverted to north
- 400 of China's 670 largest cities lack enough water

Cost and size of project:

- \$60 billion, world's largest water
- movement project
- 2x as expensive as Three Gorges Dam
- Three major canal systems, pumps to lift
- water over mountain ranges
- Aqueducts to carry water across or below
- dozens of rivers
- 45 billion cubic meters of water 1300 km
- to be moved annually

Environmental concerns:

- Loss of ecosystems and species
- Climate impacts
- Keeping the water clean through
- industrialized regions







### 1) Stable or smaller world population

- Education for women, access to family planning options
- Increase family security and literacy

### 2) Elimination of mass poverty

- Cooperative support from developed nations
- Stabilization of government structures

### 3) Environmentally benign technologies

- Cradle to cradle thinking
- Green building design
- Public transport (ex. BRT, bus rapid transit)

### 4) Environmentally full-cost pricing

- Include externalities
- Reform GDP measures
- Green taxes





#### 5) Sustainable consumption

- Product certification, green labeling
- Corporate accountability for production
- Recycle, REACH
- Eat local, eat less meat

#### 6) Green knowledge and learning

- Campus sustainability movement
- Environmental majors
- Green jobs training

#### 7) Global environmental governance & cooperation

- Work with China and India to reduce
- carbon emissions
- Meet new EU standards for toxics
- and e-waste

#### 8) Transformation of consciousness

- Valuing quality of life and well-being
- Adopt the Earth Charter guidelines



1) Moral authority

- Apply religious ethics to environmental issues
- Interfaith or within faith leadership initiatives
- Religion-science dialogues regarding environment

2) Provide meaning by shaping worldviews

- Share texts and practices that support “care for creation”
- Reconsider religious doctrine to support cultural greening
- Promote institutional resources

3) Galvanize members of faith-based groups

- Green sanctuary movement, Interfaith Power and Light
- Youth and adult religious education on environmental concerns

4) Share physical resources (retreat centers, open space, cemeteries)

- Land restoration projects
- Green burials

5) Build community to support sustainability practices

- Collaborate with local groups around common goals
- Join web-based community exchange of ideas

-- Gary Gardner, *State of the World 2002*





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## **EARTH CHARTER Preamble**

*We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations...*

*The spirit of human solidarity and kinship with all life is strengthened when we live with reverence for the mystery of being, gratitude for the gift of life, and humility regarding the human place in nature.*

-- The Earth Charter