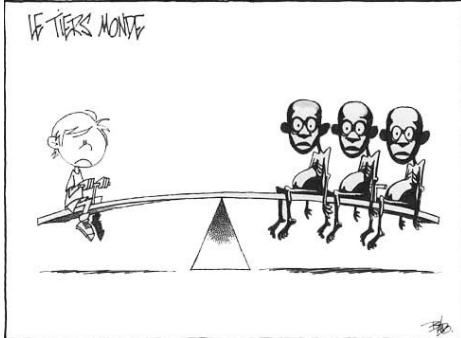


## The Problem of Consumption



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The Earth's population is around 6.6 billion and is estimated to surpass 8.9 billion by 2050 according to a UN report published in 2004.

How does this affect our planet?

There is increasing strain placed on the Earth's resources as our numbers go up.

However, population growth is not the main cause of the environmental problems we face today!

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What do the following expressions tell you about our society?

Retail therapy

Shop till you drop

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Consumption



- Since the Industrial Revolution, our ability to produce and consume more has steadily grown.
- Ever-accelerating human consumption of natural resources lies at the root of many of our global environmental problems.
- Current consumption patterns stress limited natural resources, contribute to global warming, and create wasteful and even toxic byproducts that affect the quality of life and the health of communities around the world.
- Add global population growth to the mix, and it becomes increasingly clear how the health of the ecosystems we depend on for survival are being compromised.

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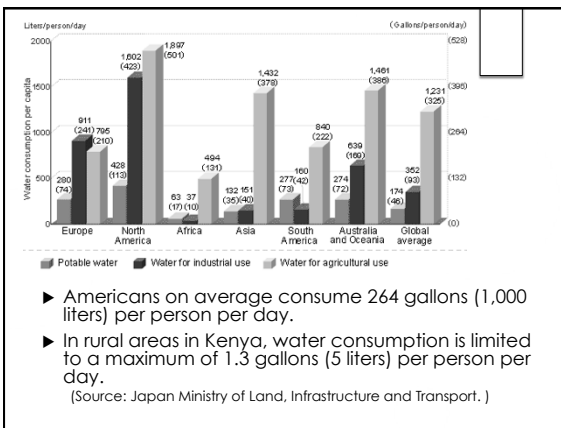
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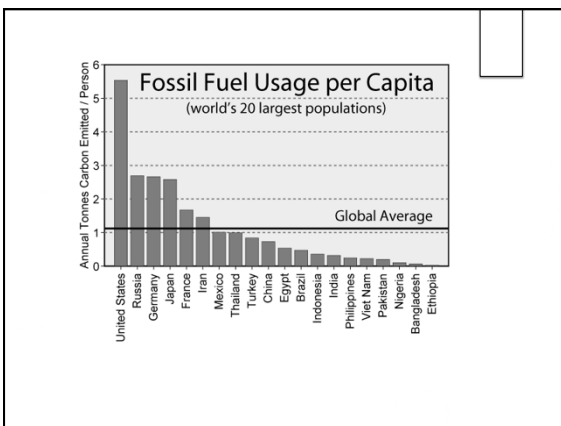
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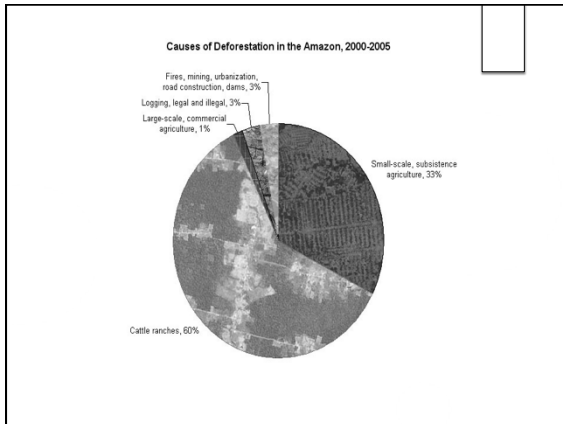
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### Distribution of Wealth

- ▶ An important dimension of the problem of consumption are the extremes of wealth and poverty, the fact that some consume too much while others do not have enough.
- ▶ It is estimated that the richest 20% of the world population consumes 80% of the world's resources.

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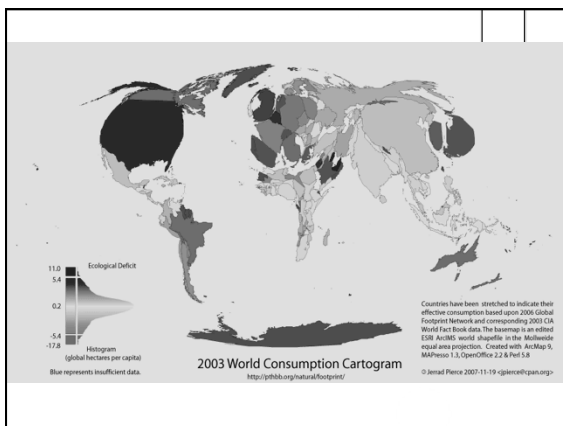
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### Solutions?

- ▶ Reducing excessive consumption does not necessarily have to mean a reduction in the standard of living.
- ▶ Recent studies show that the Western lifestyle could be maintained with much greater efficiency in resource use.

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### Ecological Footprint

An ecological footprint is the area required to provide the goods and services consumed by individuals, communities or organizations.

Your homework: Calculate your own ecological footprint.  
<http://www.myfootprint.org/>



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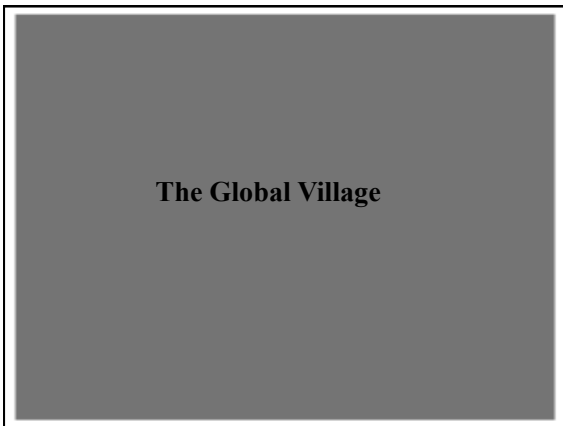
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**One World**

**"Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However integration of environment and development concerns and greater attention to them will lead to the fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can - in a global partnership for sustainable development."**

*Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June, 1992.*

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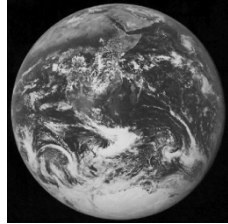
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## The Global Village

- ▶ A Canadian professor of Communications, Marshall McLuhan noted that the world seemed to be getting smaller all the time.
- ▶ His phrase “the global village” describes the situation aptly.



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## Transportation and Communications

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## The Global Village - Transportation

- ▶ Transportation on land, sea and air have been revolutionized during the last century or two.
- ▶ In the 19th century the railway transformed British North America and helped to create a new country.
- ▶ Traveling overland across Canada went from being a virtual impossibility to a relatively comfortable trip of less than a week.



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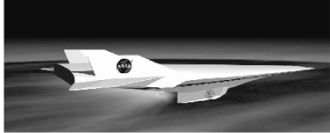
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### The Global Village - Transportation II

- ▶ Modern aircraft shorten the journey even more.
- ▶ It now takes as little as 9 hours to fly from London, England to Vancouver, BC.
- ▶ Future generations of SCRAMJET aircraft may reduce this time to under 1 hour.



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### The Global Village - Transportation III

- ▶ Our technological achievements are even taking us beyond this world - into space.



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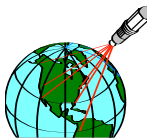
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### The Global Village - Communications



Time and space are also compressed by modern means of communications.



- ▶ Telephones, fax machines and the internet bring people together instantly.

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### The Global Village - Communications II

- ▶ In the developing world, cell phone and satellite communications may enable countries to avoid the problems and expense of maintaining land-line links.



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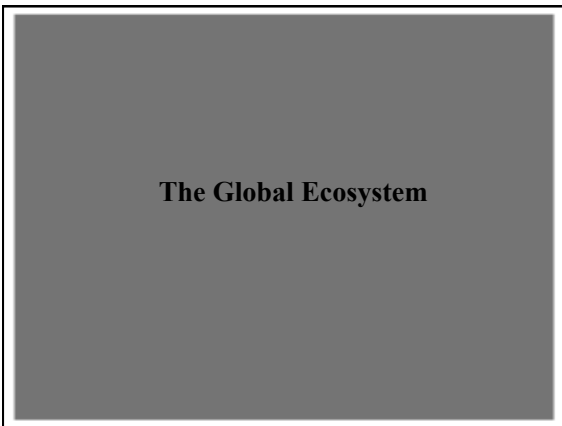
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### The Global Ecosystem



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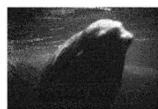
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### The Global Ecosystem

- ▶ The world is a closed system. Changes in its elements may have wide-ranging effects.
- ▶ Biological systems may be local, but they still interact with larger systems.



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## The Global Ecosystem II



- ▶ Man has a huge impact upon the natural world.



- ▶ Entire ecosystems have been modified or entirely replaced.

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## The Global Ecosystem III

- ▶ In recent years much concern has been voiced over the loss of rain forest in temperate & tropical climates. Rainforests are sometimes referred to



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## The Global Ecosystem IV

- ▶ Since 1970 the world's wooded area per 1,000 population has been reduced from 11.4 square kilometers to less than 7.3.
- ▶ From 1990 to 2000, the rate of loss of forest cover was .2% per year – 9, 391,000 hectares in total.

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## The Global Ecosystem V



- ▶ Concern has been expressed over the loss of plant and animal species as woodland is converted to pasture or cropland.

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## The Global Ecosystem VI



Former farmland in South Australia

- ▶ Deforestation has sometimes led to desertification, permanently altering the local ecosystem and even triggering local climate change.

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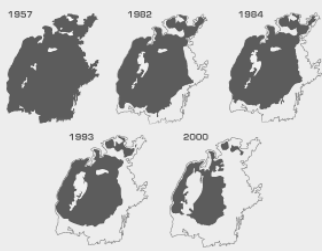
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## The Global Ecosystem VII

Aral Sea timeline



The Shrinking Aral Sea

- ▶ **Water bodies, like the land, are also affected by man's actions.**

- ▶ Irrigation projects launched by the government of the former Soviet Union has deprived this water body of fresh water volume.
- ▶ The sea is now shrinking and sea life is dying in the saltier new environment.

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## The Global Ecosystem VIII

- ▶ The United Nations reported in 1998 that 20 countries already suffer from water stress - with less than 1,000 cubic meters of water per capita available.
- ▶ It also reports that the 1950 total of 17,000 cubic meters per capita has been reduced to merely 7,000 today.
- ▶ As population increases, our ability to sustain life is being reduced. The UN suggests that 2/3 of the world's population will face moderate to severe stress in 2025.



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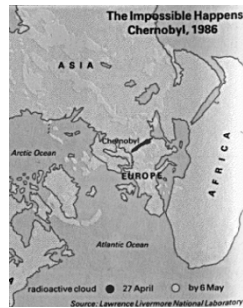
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## The Global Ecosystem IX

- ▶ Local incidents may now have regional, or even global implications, as the Chernobyl nuclear accident of 1986 showed. Radiation fallout contaminated wide areas of Europe.



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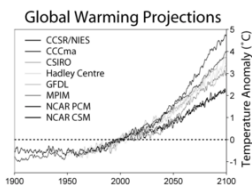
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## Global Warming



- ▶ One of the most alarming threats facing the world is global warming.
- ▶ Though the earth has warmed and cooled a number of times in the past, it has not happened so quickly before – and this time it is triggered by human activity.

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### Global Warming

#### Global warming: Causes and effects

Earth's temperature has risen about 1 degree Fahrenheit in the last century. The past 50 years of warming has been attributed to human activity.

Burning fuels such as coal, natural gas and oil produces greenhouse gases in excessive amounts.

Greenhouse gases are emissions that rise into the atmosphere and trap the sun's energy, keeping heat from escaping.

The United States was responsible for 20 percent of the global greenhouse gases emitted in 1997.

Most of the world's emissions are attributed to the United States' large-scale use of fuels in vehicles and factories.

During the past 100 years global sea levels have risen 4 to 8 inches.

Some predictions for local changes include increasingly hot summers and more thunderstorms.

Damaging storms, droughts and related weather phenomena cause an increase in economic and health problems. Warmer weather provides breeding grounds for insects such as malaria-carrying mosquitoes.

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### Global Warming

▶ Human production of greenhouse gases allows more heat to be retained within the atmosphere than would occur without them.

▶ The result is heating of the earth – with many ecological changes.

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### Global Warming

▶ Melting Icecaps.

▶ Desertification.

The top image shows a vast, flat, snow-covered landscape with mountains in the distance. The bottom image shows a person sitting on a cracked, dry, and barren ground surface.

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## Global Warming



▶ Rapid changes in living conditions for plants and animals.



▶ Rising sea levels as polar ice melts.

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## Global Warming

- ▶ Were it not for the poor world economy, this would be a top story in the news.
- ▶ President Bush largely ignored the issue. Obama sees it as important, but cannot get enough political support to deal with it.
- ▶ Others, including most scientists, believe action must be taken now – to avert a global catastrophe.



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## Copenhagen Conference



- When the world met at Copenhagen in December 2009, there were high hopes for progress in dealing with climate change, a treaty to replace and improve upon the 1997 Kyoto Protocol.
- Coming during a major world economic downturn, it resulted in disaster.
- In particular, there was a falling out between the US and China.

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## Copenhagen Conference

- ▶ China, now the #1 producer of greenhouse gasses, wants special treatment as a developing nation – something accepted at earlier talks.
- ▶ The US wants China treated like a developed nation. In addition, Obama is unable to get Congress to even consider cuts to US emissions as Republicans, especially of the "Tea Party" sort – don't even accept the premise of climate change.



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## The Global Economy

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## The Global Economy

- ▶ Trade has always brought intercultural contact.
- ▶ Globalization -today's international economy has made brought unparalleled integration. Money trades freely in most of the world.



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## The Global Economy II



- ▶ Since World War II international trade and investment has grown enormously.
- ▶ In the developed world prosperity increased enormously.
- ▶ Newly industrialized economies have also prospered.

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## The Global Economy III

- ▶ Nonetheless, business is not without risks.
- ▶ The lure of better profits elsewhere can cause investors to pull their money out.
- ▶ Money can leave quickly, resulting in devastation in local economies.



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## The Global Economy IV

- ▶ In the late 1990's currency speculators devastated some newly industrializing Asian economies when they withdrew funds from local currencies.



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## The Global Economy V

- ▶ In 2008 the world economy experienced the most serious crisis since 1929.
- ▶ Years of governments deregulating and not enforcing regulations resulted in some the creation of new kinds of investments, called derivatives.
- ▶ These are investment certificates based on packaged securities, like ownership of mortgage debt. In an ideal world the risk is analyzed by mathematical models and derivatives serve as insurance policies.
- ▶ The problem lay in banks selling off their risk, so they lost any reason to be careful in their lending.
- ▶ Buyers of securities did not really know how much shaky debt they were buying. When the US real estate market headed downward a banking crisis followed.

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## The Global Economy VI

- ▶ Banks stopped lending and the world economy was on the verge of collapse.
- ▶ National governments bailed out the banking system and spent massively to keep business and employment afloat.



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## The Global Economy VII

- ▶ Taxpayers were left to bail out big banks, big investors, and large corporations.
- ▶ Governments now faced huge debt problems. They, quite rightly, spent money borrowed from the future to prevent a new Great Depression today.
- ▶ When to stop spending and how soon the money should be paid off are questions facing all governments today.
- ▶ Governments that seek to eliminate the debt quickly cut services to do so and hit the poor and middle class hardest. There is huge resistance to increasing taxes.
- ▶ It seems we have privatized profit and socialized risk for major corporations and investors.
- ▶ Worse still, focus on economic problems get in the way of dealing with other pressing problems.

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## One World

- ▶ We are stewards of a rare and special planet. Mankind must act responsibly to ensure that our planet survives. There can be no going back to the past; we must create a sustainable future.



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# ENVIRONMENTAL ISSUES



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## Unit Environment.

Intro:  
<http://www.unep.org/gc/qc23/UNEPLAST.html>  
David Suzuki-Test Tube Clip:  
<http://testtube.nfb.ca/#/testtube>

Story of stuff:  
<http://www.storyofstuff.com/>  
<http://breathingearth.net/>

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## Why care about the environment?

- ▶ "a great change in our stewardship (care of) the earth and the life on it is required, if the vast human misery is to be avoided"
- ▶ More storms, droughts, destruction of natural resources (economic → greater taxes)
- ▶ Up north a war could be fought!
- ▶ Some countries including US, Russia, Denmark, and Norway see the potential for economic wealth from oil and natural gas. Arctic seabed and shipping lanes free Northwest Passage




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## Population and Resources



- ▶ 80 million babies born every year
    - ▶ Mostly in developing world, so less impact
  - ▶ 20% of population consume 85% world's resources
    - ▶ 20% is in industrialized western countries
  - ▶ If small fraction of developing world lived like developed world, Earth would quickly be overwhelmed with pollution and waste
  - ▶ Earth's carrying capacity is being lost!
- [http://500printnew.org.uk/home/calculator\\_complete](http://500printnew.org.uk/home/calculator_complete)  
 Your footprint!  
<http://www.pooexpo lined.ie/Main.html>

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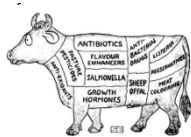
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## Feeding a growing population

- ▶ 1500 litres of water produce 1 kg of wheat, while 500 litres for 1 kg of potatoes
- ▶ More MEAT more DAIRY-1000 litres of water to make 1 litre of milk, and nearly 16000 for 1 kg of beef.
- ▶ Added to this are the costs deforestation to create grazing energy use to ship food, or resources.




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**Sustainability**

**First Nations Approach**

- ▶ Environmental stewardship (sustainable management)
- ▶ Sustainability: Keeping our environment and resources for future generations
- ▶ In the Squamish Lil'wat teach "that we should keep in mind seven generations ahead of us in everything we do, to ensure that we care for future generations as well as present."
- ▶ <https://www.youtube.com/watch?v=Sc4bXCPy8> (Sustainability explained)

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**THE BEAST THAT ATE THE EARTH**  
Chris Madden

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<b>SPECIES EXTINCTION</b>					
SPECIES EXTINCTION	CAUSES (CHEMICALS)	GLOBAL EFFECTS	HUMAN HEALTH EFFECTS	AREA OF FOCUS	POSSIBLE SOLUTIONS
<p>A species becomes extinct when the last existing member dies.</p>	<p>Species become extinct due to taking animals for profit, over hunting and trapping, overharvesting, introduced species, destruction of habitat, climate</p>	<ul style="list-style-type: none"> <li>• Loss of biodiversity, can cause climate change and air pollution.</li> <li>• We lose an important part of the food chain/web, other species are affected.</li> </ul>	<p>The food chain will be effected, and humans are at the top of the food chain. There could be an increase of pests or an outbreak of diseases, loss of medical cures.</p> <p>1) Genetic Resources (loss of genes)                  2) Potentially useful in the future (medicine)                  3) Loss may threaten stability of ecosystems                  4) Aesthetic value (beauty – and species have a value in themselves regardless of any human use)</p>	<ul style="list-style-type: none"> <li>• Climate change could wipe out 20% of the world's lizard species by 2080.</li> <li>• Climate change is also affecting polar bear due to warmer temperatures and ice melting polar bears find it harder to hunt for seals which is leading to starvation.</li> </ul>	<ul style="list-style-type: none"> <li>• selective logging</li> <li>• recycling instead of polluting the environment or proper disposal</li> <li>• Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)</li> <li>• Prevent commercial trade of endangered species</li> <li>• World Wildlife Fund (WWF)-advise government how to protect species</li> <li>• Captive breeding programs</li> <li>• Protecting African's Animals (Elephant and rhinos horns are being protected by trade bans in the EU, US, and Japan</li> <li>• Rhino horn is medicinal and in North Korea it is a status symbol leads to poaching--Kenya has ordered to kill poachers on sight, and they have tried to dehorn the rhinos</li> </ul>
<p><a href="http://www.youtube.com/watch?v=OC6_bPw7vZo">http://www.youtube.com/watch?v=OC6_bPw7vZo</a></p>					

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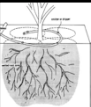
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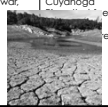
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## FRESH WATER SHORTAGE



FRESH WATER SHORTAGE	CAUSES (CHEMICALS)	GLOBAL EFFECTS	HUMAN HEALTH EFFECTS	AREA OF FOCUS	POSSIBLE SOLUTIONS
<p>3% of the world's water is fresh water; however, distribution is unequal and 78% of that water is stuck in ice caps and glaciers and the remainder is underground.</p>	<p>The shortage of fresh water is due to many things like global warming, pollution of fresh water, weather patterns changing or problems at the headwaters for rivers and aquifers. Disposal for sewage &amp; agricultural + industrial waste Tanker accidents Municipal waste water/human waste, detergents &amp; solvent Farmers + herbicides &amp; pesticides Industry=oil refinery, pulp mill &amp; chemical factory waste</p>	<p>The freshwater shortage can lead to an Aquifer drawdown or overdrafting, by pumping for more groundwater the entire system of water can be ruined. <b>Aquifers:</b> Underground water supplies</p>	<p>3.575 million people die each year from water diseases. One in nine people don't have access to freshwater. Deaths from water are greater than any deaths caused from disease, war, etc.</p>	<p>Becoming a world issue. More felt in water poor countries. Lake Erie is the shallowest of the Great Lakes, by 1960s and 1970s it became very polluted. In 1969, Cuyahoga</p> 	<p>Legislation-Clean Water Act Current technology can equal sustainable water management. Such as micro-dams, more efficient rainwater harvesting, reclaimed/recycled water, low energy sprinkler systems and high efficiency / low flow toilets</p>

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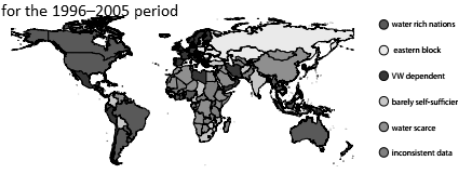
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Map of the world's countries classified on the basis of their dependency on local and virtual water resources, based on data for the 1996–2005 period



- water rich nations
- eastern block
- WW dependent
- barely self-sufficient
- water scarce
- inconsistent data

source: PNAS Jan. 2013. Water-controlled wealth of nations. Samir Suweisa, Andrea Rinaldob, Amos Maritana, and Paolo D'Odoricod

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### Ogallala Aquifer - USA

- ▶ One of the largest aquifers in the world, but is depleting quickly from agriculture (greatest user of freshwater) - China and Punjab facing huge issues
- ▶ Aquifer is also heavily used for golf courses

<http://www.youtube.com/watch?v=UQRvN6MU0jE>  
<https://www.youtube.com/watch?v=JMPE9wB37k>  
GM foods  
[http://www.youtube.com/watch?v=Yocjg\\_N5s1I&feature=youtu.be&t=33s](http://www.youtube.com/watch?v=Yocjg_N5s1I&feature=youtu.be&t=33s)  
Agricultural Revolution



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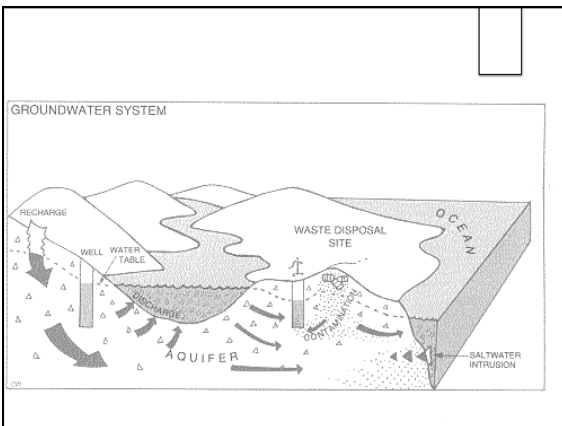
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<http://www.youtube.com/watch?v=WI9owddp0wQ&feature=related>

## Renewable/Non-Renewable Resources

- ▶ **Renewable** – Water, wood, wind power, solar power, geothermal energy
- ▶ **Non-renewable** – Fossil fuels, coal, oil, gas, nuclear power. Burning causes some of the issues we saw earlier: CO<sub>2</sub> Global Warming

NOX/SO<sub>2</sub> → Acid Rain  
 CFCs → Ozone Layer Depletion

<http://www.brainpop.com/science/energy/energysources/>

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### Solutions!

- ▶ Many sustainable sources of energy
  - ▶ Wind turbines, solar power, tidal power, ground source energy, geothermal power
- ▶ Greenpeace believes wind power could provide 10% world's electricity needs in next 20 years
- ▶ New hydrogen or methanol fuel cells could be adapted for cars, buses, homes and industries

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## ACID RAIN

ACID RAIN	CAUSES (CHEMICALS)	GLOBAL EFFECTS	HUMAN HEALTH EFFECTS	AREA OF FOCUS	POSSIBLE SOLUTIONS
Any form of precipitation that is high in sulfuric acid and nitric acids as a result of pollution in the air. Falls as "poison rain"	Acid Rain is caused by gasses like sulphur oxide and nitric acid.	Many forests are destroyed due to acid rain it can make them lose their leaves, damage their bark, and stunt their growth. Water bodies are also affected if the pH of a lake drops below 4.8, its plants and animals risk death and it is estimated that around 50,000 lakes in the United States and Canada have a pH below normal.	Water that people drink can become toxic due to acid rain. It can also cause respiratory infections, and cause an increase in breast and colon cancer	Damage to forests by acid rain is seen all over the world. But in Eastern Europe, it's estimated that in Germany and Poland, half of the forests are damaged, while 30% in Switzerland	Some possible solutions are wind turbines, solar power, ground source energy and geothermal power. Even new hydrogen and methanol fuel cells could be made for cars, buses, homes and industries. Installing scrubbers in chimneys Air Care Using catalytic converters in cars

<http://www.youtube.com/watch?v=090ngYr-c>  
<http://www.youtube.com/watch?v=7UstJpQJ8>  
<http://www.youtube.com/watch?v=7UstJpQJ8>  
<http://brainmate.com/videos/DJWWRPKY>  
<http://www.youtube.com/watch?v=7UstJpQJ8>  
[http://www.emu.edu.qps/faq/faq/ckf/fbase/1/fbase/ysysr\\_09\\_baser/ysysreg\\_animation.swf](http://www.emu.edu.qps/faq/faq/ckf/fbase/1/fbase/ysysr_09_baser/ysysreg_animation.swf)

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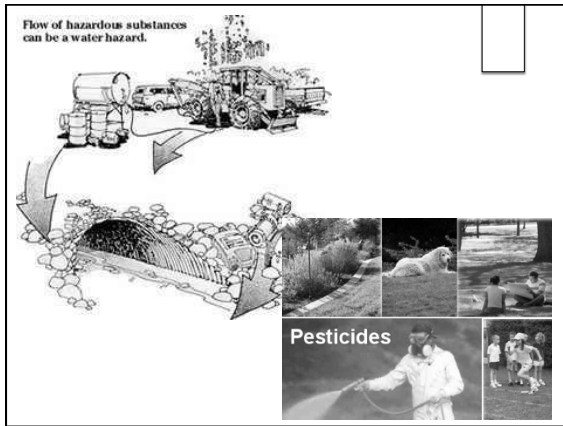
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## DEFORESTATION

DEFORESTATION	CHEMICAL (CAUSES)	GLOBAL EFFECTS	HEALTH AND HUMAN EFFECTS	AREA OF FOCUS	POSSIBLE SOLUTIONS
<p>The process of destroying a forest and replacing it with something else.</p> <p>Importance: Storehouses of biodiversity Absorb CO2 and supply O2</p>	<p>Logging, or cutting down trees in a forest to harvest timber for wood, products or fuel, is a primary driver of deforestation. Along with Agriculture, farmers clear the land for crops or for cattle and often will clear acres of land using slash and burn techniques.</p>	<p>Cutting down rainforest can alter global weather by altering wind and ocean current patterns. The diminishing forest will result in an increase and concentration of the greenhouse gases which will lead to even more global warming. And can also lead to the erosion of soil, disruption of the water cycle, flooding and droughts.</p> <p>Contributes to Global Warming</p> <p>Affects wind patterns</p> <p>Affects precipitation levels</p> <p>Alters</p>	<p>Loss of oxygen because trees give off oxygen. Floods and droughts can cause deaths and force people to leave their homes.</p>	<p><b>Philippine Archipelago:</b> 90% of the country's forests have been lost</p> <p><b>Ethiopia:</b> In the past 50 years, 98% of the forested regions of the country are gone. 14% were lost between 1990 and 2005</p> <p><b>Canada:</b> Clearcutting, forest fires, pine beetles, dam deforestation</p> 	<p>Protected Area Strategy (PAS) is a plan to preserve approx. 12% of BC's provincial land for parks, recreation and wilderness.</p>

<http://www.youtube.com/watch?v=TheXrvYQ8NR-1&feature=embed>  
<http://www.youtube.com/watch?v=sttuh0372w>  
<https://www.youtube.com/watch?v=an130Vc3L4> (Five Bees)

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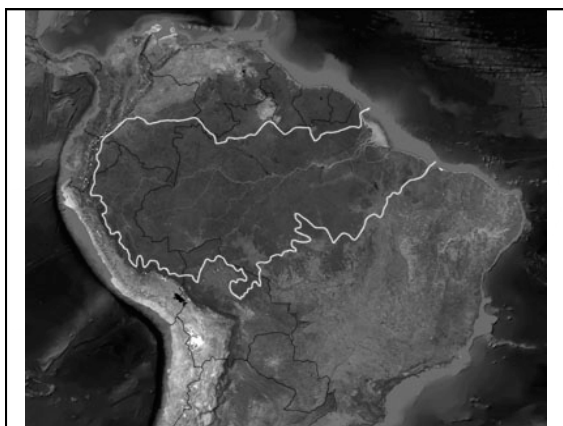
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