



Chapter 1

Studying the State of Our Earth

Environmental Science Offers Important Insights Into Our World and how We Influence It

1. Social Consequence
2. Economic Consequence
3. Environmental Consequence

Social consequence is a connection to human activities such as GMO's, climate change, pollution, resource depletion, species protection, global warming...etc

We manipulate the environment MORE than any other species (ex. Pfiesteria (algae) increase due to dumping waste (nutrients) into the river, \$40mil loss of marine life *seafood sales)!!!

TABLE 1.2 Five key global environmental indicators

Indicator	Recent trend	Outlook for future	Overall impact on environmental quality
1. Biological diversity	Large number of extinctions, extinction rate increasing	Extinctions will continue	Negative
2. Food production support	Per capita production possibly	Unclear leveling off	May affect the number of people Earth can
3. Average global surface temperature and CO ₂ concentrations	CO ₂ concentrations and temperatures increasing	Probably will continue to increase, at least in the short term	Effects are uncertain and varied, but probably detrimental
4. Human population	Still increasing, but growth rate slowing	Population leveling off Resource consumption rates are also a factor	Negative
5. Resource depletion	Many resources are being depleted at rapid rates. But human ingenuity frequently develops "new" resources, and efficiency of resource use is increasing in many cases	Unknown	Increased use of most resources has negative effects

Biodiversity- the diversity of life formed in an environment (total number of different species)

Table 1.2

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help us describe the current state/health of an environmental system

Development- improvement in human well-being through **economic advancement**. As economies develop, resource consumption also increases.

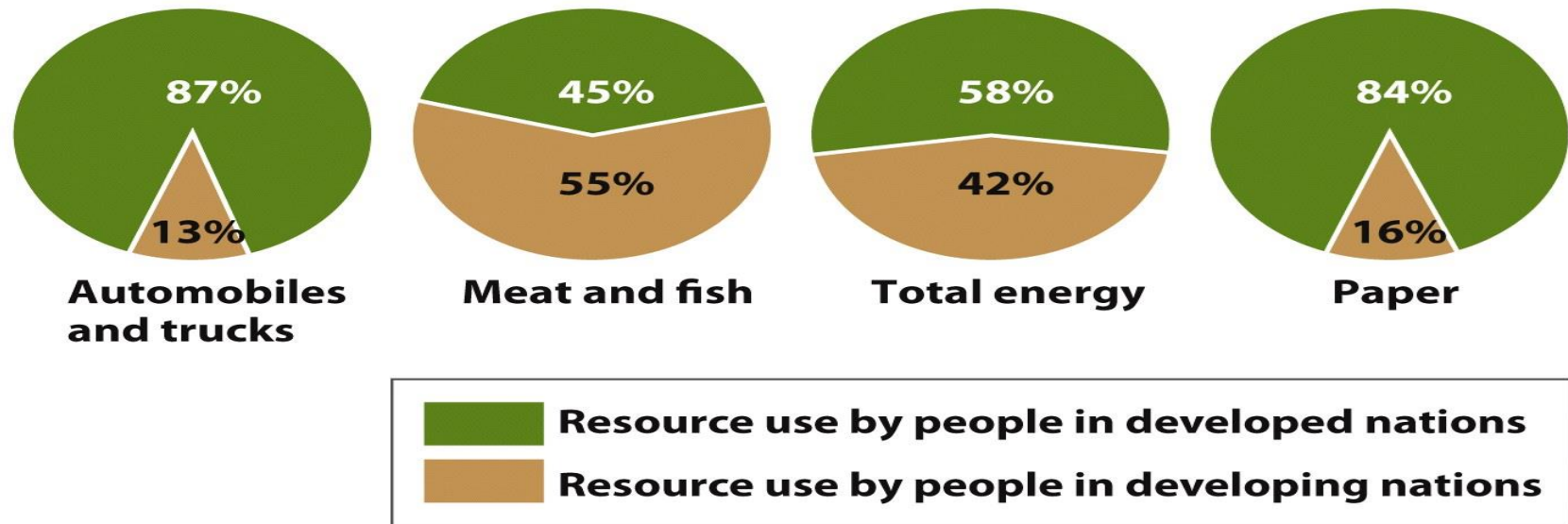


Figure 1.10
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Developed nations such as U.S., Canada, Australia, most of European countries and Japan hold 20% of the global population but consume (look above)...

The poorest 20% of the world's population consume 5% or less of these resources...Haiti, Ethiopia, Tanzania

• Sustainable Development-

development that balances current human well-being and economic advancement with resource management for the benefit of future generations.

Overuse of resources by the people is the primary cause for the demise of most civilizations

(ex.) *Easter Island* – once filled with trees, grasses...etc, humans settled in and overused the resources, which caused a massive destruction of the land, collapsing the civilization.

**Human Well-Being
Depends on
Sustainable Practices**

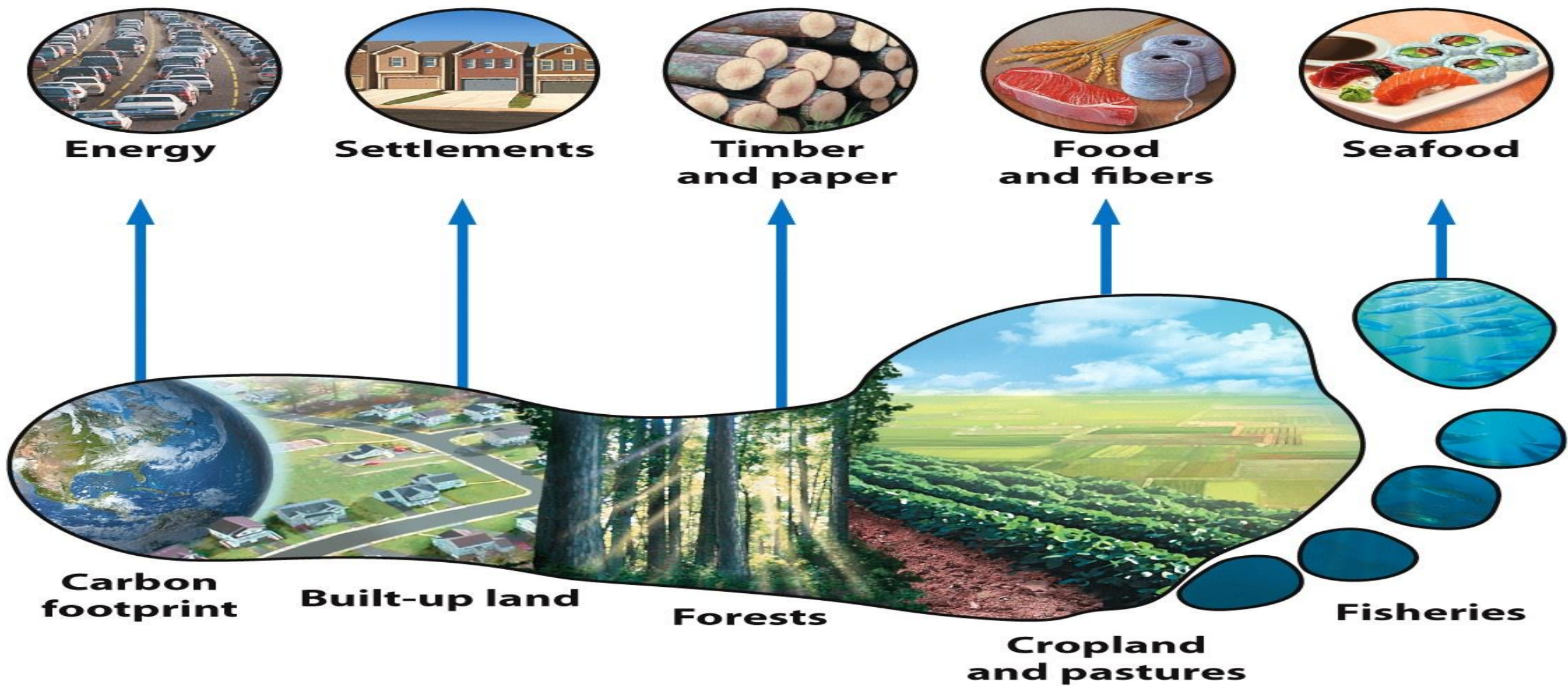


Basic Human needs: air, water, shelter and food

In order to live sustainably:

1. Environmental systems must not be damaged beyond their ability to recover.
2. Renewable resources must not be depleted faster than they can regenerate.
3. Nonrenewable resources must be used sparingly

Living sustainable means ***acting in a way such that activities that are crucial to human society can continue*** (ways to conserve & find alternatives to nonrenewable resources as well as protecting the environment to supply renewable resources).



We can calculate the ecological footprint of the food we eat, the water and energy we use, and even the activities we perform that contributes to climate change (*how much a person consumes, expressed in area of land, impact on the world's resources*)



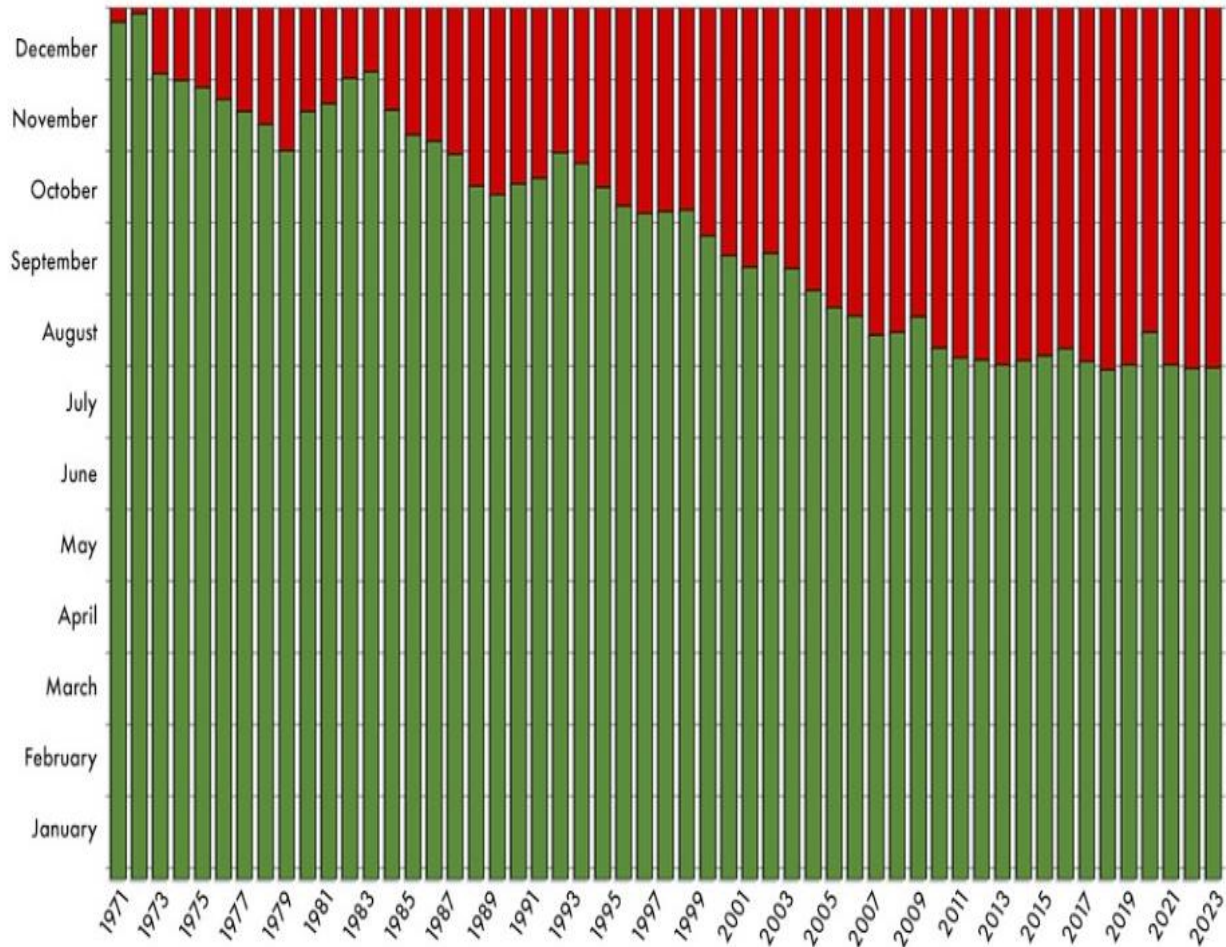
Earth Overshoot Day



1971 - 2023

1 Earth

1.7 Earths



Past Overshoot Days

Earth Overshoot Day is computed by dividing the planet's biocapacity (the amount of ecological resources Earth is able to generate that year), by humanity's Ecological Footprint (humanity's demand for that year), and multiplying by 365, the number of days in a year.

How does this year's date compare to that of previous years?

[EXPLORE PAST OVERSHOOT DAYS](#)



Source: National Footprint and Biocapacity Accounts 2023 Edition
data.footprintnetwork.org

Overshoot Day...

Experimental Science Presents Unique Challenges

There is **no "control"** (group) planet to compare the Earth with.

It is difficult to decide what is better or worse for the environment than something else.

Environmental science has so many interacting parts, it is not easy to apply one system to another... **UNDERSTAND THE PROBLEM, TO CREATE A SOLUTION!!!**

Human well-being is a concern because people that are **unable to meet their basic needs are less likely to be interested in saving the environment.**