

How Bad Is It?

Between 2001 and 2007 the *Millennium Ecosystem Assessment* drew on the work of 1,360 scientists worldwide and came up with the finding:

Millennium Ecosystem Assessment

The Balance Sheet

| Enhanced | Degraded | Mixed |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Crops Livestock Aquaculture Carbon sequestration | Capture fisheries Wild foods Wood fuel Genetic resources Biochemicals Fresh Water Air quality regulation Regional & local climate regulation Erosion regulation Water purification Pest regulation Pollination Natural Hazard regulation Spiritual & religious Aesthetic values | Timber Fiber Water regulation Disease regulation Recreation & ecotourism |

Bottom Line: 60% of Ecosystem Services are Degraded

The researchers concluded that most of the degradation has resulted from activities in the past century, sometimes just the past few decades.

What Can We Do?

Most researchers agree on most or all of the following ways to be more sustainable:

- Reduce personal consumption of materials and energy; sometimes called “voluntary simplicity”
- Retrofit houses and other buildings to be more energy efficient;
- Replace fossil fuel energy sources such as oil and gas with carbon free wind and direct solar;
- Build efficient national infrastructure such as high speed rail;
- Build local networks for food to reduce transportation costs and fuel use

Social Justice and Sustainability

Our highly unequal modern world is itself a factor in preventing sustainability. Working for social justice combines naturally and meaningfully with working for sustainability:

- The super rich waste material resources and energy to indulge in extravagant lifestyles;
- The big corporate interests that often oppose reasonable environmental actions are controlled primarily by the wealthiest persons;
- The poor often have to degrade their environments just to survive, for example by chopping down trees for firewood or building homes on steep slopes;
- The poor have little stake in sustainable practices unless the sustainability movement offers them a sustainable means for a better life;
- A more egalitarian world would make more efficient use of materials and energy;
- The very definition of sustainability in the Brundtland Report implies that we recognize that future generations — our children and grandchildren, have the same rights to resources as do we;
- Social justice makes it possible to build stronger communities

Community: a group of people who live close to each other and interact regularly. People who work together to meet human needs and who treat each other with mutual respect.

The word "community" is derived from the Old French *communité* which is derived from the Latin *communitas* (*cum*, "with/together" + *munus*, "gift"), a broad term for fellowship or organized society. [Wikipedia]

For this brochure online, go to:
<http://msuweb.montclair.edu/~franker/SustainableTompkins/TeachYourselfSustainability/WhatIsSustainabilityBrochure.pdf>

For a detailed pdf powerpoint version of this handout with additional information and complete references, go to:

<http://msuweb.montclair.edu/~franker/SustainableTompkins/Frankewhatissustainability2015.pdf>

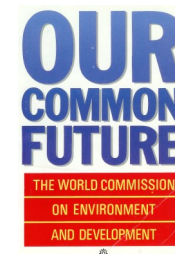


Sustainability: What Is It?

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The word "sustainability" came into the public sphere in 1987 with *Our Common Future*, also known as the "Brundtland Report," from the "The World Commission on Environment and Development," commissioned by the United Nations. This report contains the most widely cited definition of sustainability:



Meeting "...the needs of the present without compromising the ability of future generations to meet their own needs... sustainable development must not endanger the natural systems that support life on earth: the atmosphere, the waters, the soils and the living beings."

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University Press. Pages 8, 43 and 45.

More →

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History of Sustainability

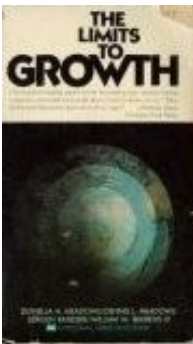
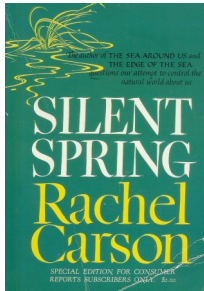
The idea of sustainability developed over the course of the 20th century as scientists and others began to notice that human production and distribution systems - the economy - were beginning to push against the limits of earth's resource base and/or to disturb natural systems in ways never before observed.

Important milestones:

1. **Rachel Carson's** 1962 book *Silent Spring* warned that "Future generations are unlikely to condone our lack of prudent concern for the integrity of the natural world that supports all life." (page 13) Carson worried especially about the effects of new chemical pesticides overused in place of natural balances that had evolved over many millennia.

2. *The Limits to Growth*.

In 1972 a group of Massachusetts Institute of Technology computer geeks - among the first of the genre - came out with a study supported by an industry group called "The Club of Rome." Based on complicated computer simulations, authors Donella Meadows, Dennis Meadows and Jorgen Randers argued that if (then) present trends in population, industrial and consumption growth continued, it was likely that "a rather sudden and uncontrollable decline in both population and



History of Sustainability

industrial capacity" would occur "sometime within the next one hundred years." In other words, a collapse of civilization.

Mainstream economists criticized and even ridiculed *The Limits to Growth* but over the years since 1972 more and more experts and much of the public have come to consider it an appropriate warning.

3. **The Scientists' Warning to Humanity**

was issued in November of 1992. Signed by 1,700 leading scientists including a majority of the Nobel Prize Laureates in the sciences who were alive at the time, it begins "Human beings and the natural world are on a collision course." The Warning noted "critical stress" on the atmosphere, fresh water, the oceans, soil, forests, and living species and went on the claim that "Much of this damage is irreversible on a scale of centuries or permanent." Signers claimed we face the prospect of "vast human misery" and the threat that the earth could become "irretrievably mutilated." The scientists acknowledged that the scale and timing of vast human misery was hard to predict, but argued that "Uncertainty over the extent of these effects cannot excuse complacency or delay in facing the threat."

4. The **Rio Earth Summit of 1992** reinforced the idea that uncertainty "cannot excuse complacency", enshrining this idea as *The Precautionary Principle*, number 15 of 27 principles adopted by the conference. Principle 7 includes the statement that "States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem."

History of Sustainability

In June, 2012 a Rio + 20 Conference was held in Johannesburg, but many observers consider it to have had less impact than desired. In December, 2015 the Paris conference set goals for limiting global warming, but skeptics worry about implementation.

Science and Sustainability: Developing Necessary Concepts

Parallel to the various conferences and statements, scientists have conducted substantial research into many aspects of sustainability. Economist Herman Daly proposed a set of basic definitions and rules for thinking about sustainability:

- **The economy is a subsystem of the earth. The subsystem cannot grow beyond the frontiers of the total system. Humans must live within Earth's limits. This means...**
- **Renewable resources should be harvested at a rate not to exceed their regeneration ability. If harvested faster than they can regenerate, at some point they will be exhausted. Examples: soil, water, forests, fish.**
- **Nonrenewable resources should not be exploited faster than the rate at which they can be replaced by renewable resources. Examples: fossil fuel, high-grade mineral ores, fossil groundwater.**
- **Wastes should not exceed the assimilation capacity of the environment. Examples: sewage, lead in children's blood, DDT, carbon dioxide in the atmosphere above a reference amount such as 350 parts per million. More →**