Sustainable Development

is meeting human and biophysical needs

Sustainable development is “improving the quality of human life while living within the carrying capacity of supporting ecosystems”.
(IUCN, UNEP and WWF, *Caring for the Earth*, 1991)

and

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (U.N. Brundtland Report, 1987)

Will future generations be able to meet their needs?

What Are Biophysical Needs?

Biophysical systems are made up of many interacting and interdependent components. Because ecosystems continually process energy and information from their surrounding environments they must constantly adjust (equilibrate) to changing conditions.

The ability of a system to absorb shocks and adapt to changes is called resilience. If the existence of an entire system is dependent on the health of a few species, it may easily collapse when stressed. For this reason larger and more complex ecosystems are more resilient than smaller and simpler systems.

Ecosystems need to maintain wholeness and health if they are to survive. Human-induced stresses are threatening to degrade ecosystems beyond threshold points—the points at which additional degradation will trigger irreversible collapse.

Clearcut forest in British Columbia

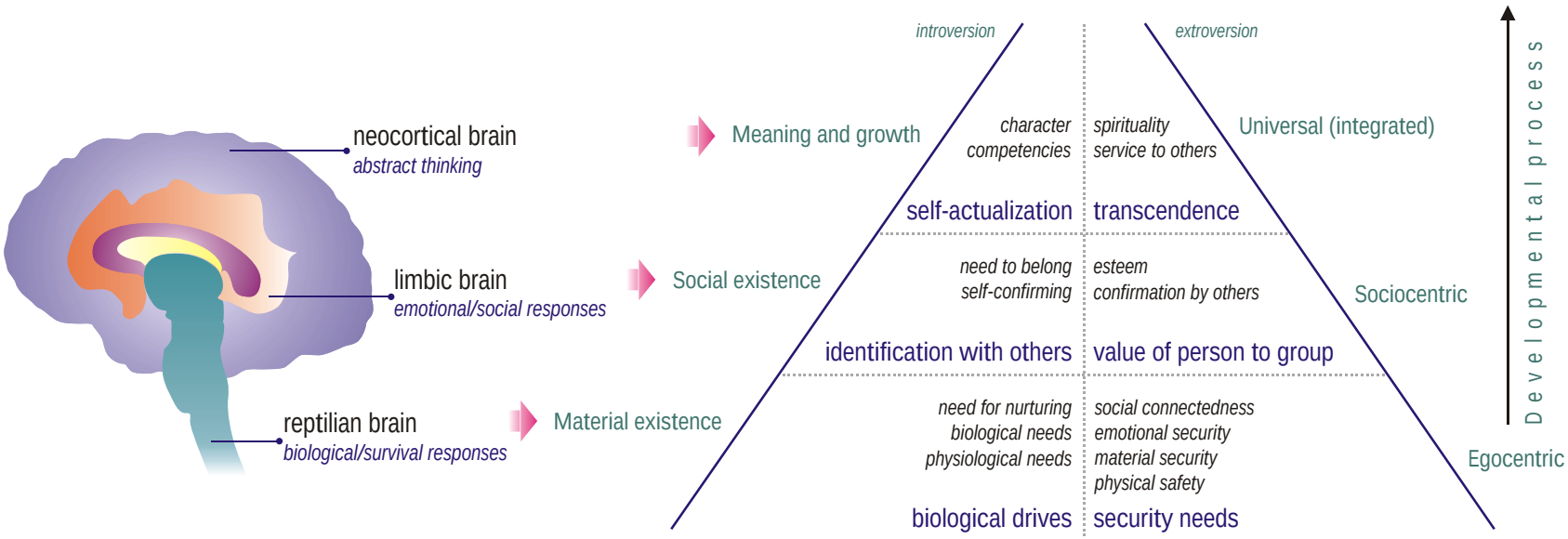
Without wholeness and health ecosystems can be irreversibly damaged

What Are Human Needs?

Humans are the only species who use symbols to interpret their environments. We live in societal systems because we cannot survive without learning to use symbols and tools.

Language, culture and social institutions co-evolved with the human brain. Our triune brains represent three levels of evolution: the reptilian brain enables physiological responses; the limbic or mammalian brain enables emotional responses; and the large neocortex enables abstract thinking. Humans have three corresponding levels of needs: material existence needs; social existence needs; and needs for meaning and growth.

Humans require physical, emotional and spiritual wellbeing – individually, with each other and with nature.



Interactive triune brain

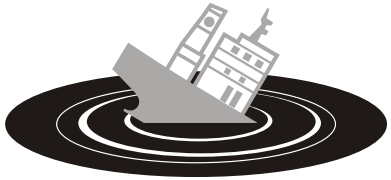
Human needs hierarchy

Brain illustration adapted from T. Lewis, F. Amini and R. Lannon (2000), *A General Theory of Love, New York, NY: Vintage Books.*
Hierarchy adapted from W.G. Huitt's reorganization of Maslow's and Alderfer's hierarchies in *Educational Psychology Interactive 2004.*

Genuine Progress Indicators

Our economic system is based on false and incomplete accounting. Economic transactions generated by destructive or non-productive activities such as wars, addictions or speculation are considered to add value, while unpaid productive activities such as parenting, housework or volunteer work are not valued at all.

With GDP accounting:



= +

The economic activity created by accidents adds value

= 0

Parenting and unpaid agricultural work have no value

A sustainable global system must be able to accurately determine the real costs and benefits of human and biophysical activities. Accounting must be based on Genuine Progress Indicators (GPI) as well as Gross Domestic Product (GDP). While GDP only tracks monetary activities, GPI also accounts for social and environmental costs in order to evaluate personal and public well-being.

With GPI accounting:

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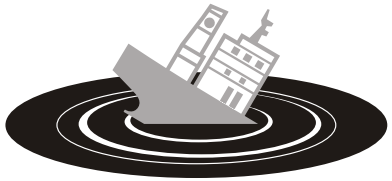
All productive work adds value



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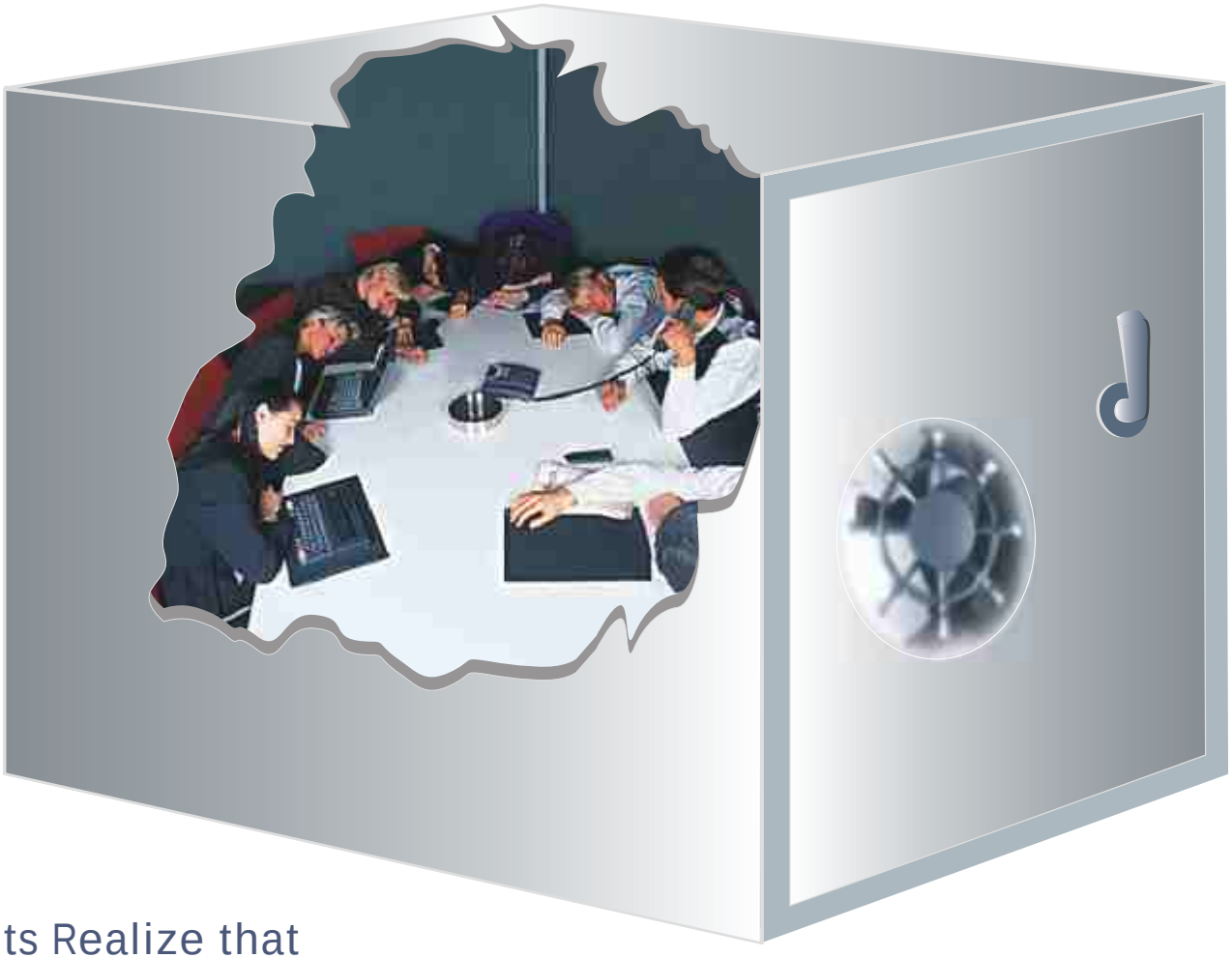
Pollution and accidents reduce value

The Real Bottom Line

Orthodox economics dismisses social and environmental costs as “externalities”. This means that values such as health and well-being are not included in economic modelling, planning or accounting.



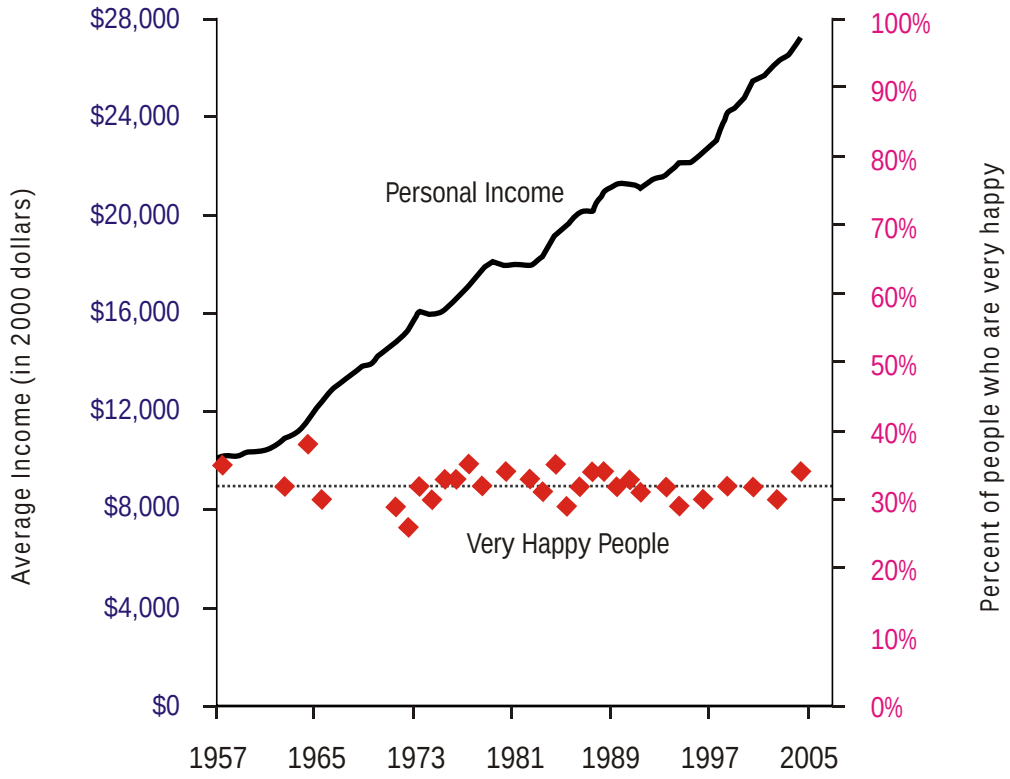
Will Economists Realize that Fresh Air and Water Have Value?

Money is not the real bottom line.

Meeting Real Needs, Not False Greeds

Global sustainability can be achieved if the world economy is redesigned to meet real needs instead of false greeds. This can be done through taking into account qualitative as well as quantitative factors.

International surveys indicate that rising incomes increase happiness only in poor countries. Increased income has little influence on happiness once basic needs are satisfied (for food, shelter, healthcare, education, etc.). After real material needs are met, it is easier to increase happiness by improving the quality of lives than by increasing the quantity of goods.



Average Income and Happiness in the United States, 1957-2004

Chart from D.G. Myers (2007), in *Psychology,* 8th Ed., New York, NY: Worth Publishers

The Need for a New Model

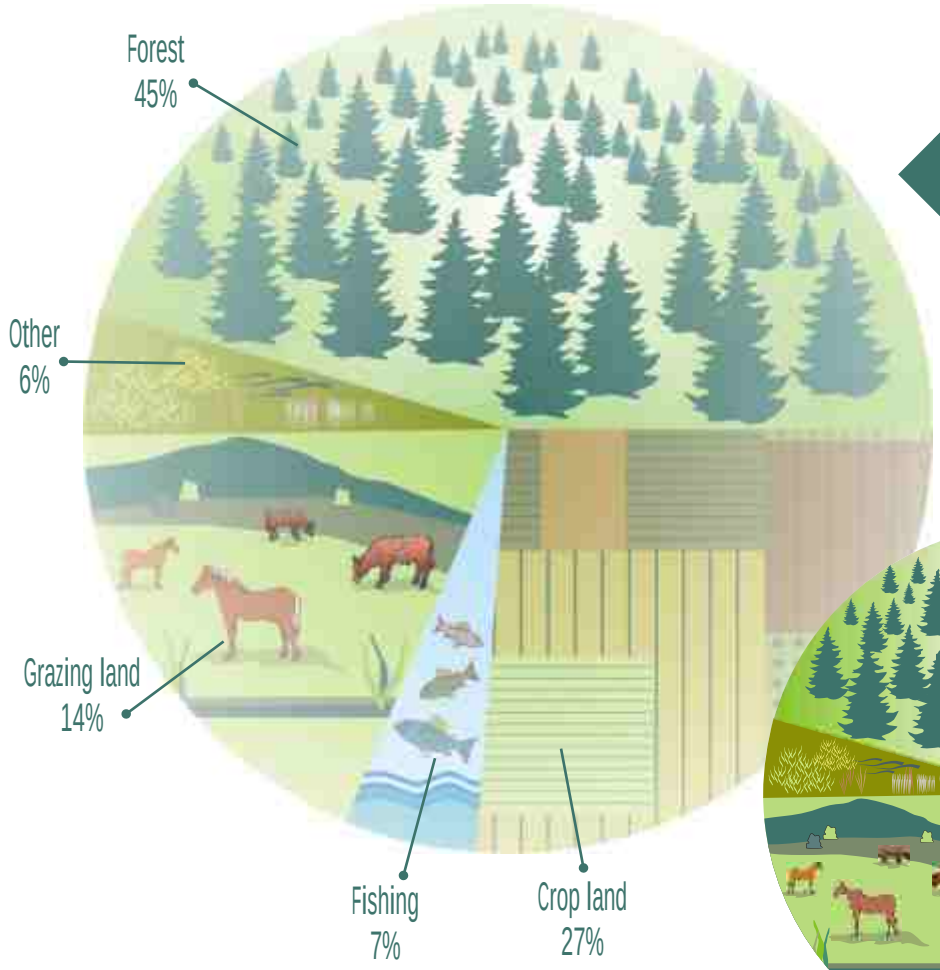
Industrial civilization is no longer sustainable:
the industrial model is no longer relevant.

Our political and economic system is organized around the obsolete expansionist worldview of the industrial age.

The current economic model fails to understand that the viability of human social systems is utterly dependent on the viability of biophysical systems.

Global Natural Capital and Income

The carrying capacity of our planet equals the biosphere's total annual production of goods and services. This is the global annual natural income.



- The global natural capital is equivalent to approximately 11.3 billion hectares of biologically productive land and sea.
(From: *WWF Living Planet Report, 2004)*

Natural Capital (Principal)

- Natural capital is the stock of natural assets that yields a flow of valuable goods and services into the future.

Natural Income (Interest)

- Natural income is the sustainable flow of goods and services from the stock of natural capital.
(From Rees, 1995)

Diagrams not to scale

Per Capita Ecological Footprints

The Per Capita Ecological Footprint is a tool for measuring and analyzing the average annual natural resource consumption and waste output of individuals.

= 1.8 ha.

Each person's fair ecological footprint (earthshare) in 2001. (The average amount of biologically productive land and sea available for each person on earth.)

= 6.4 ha.

Each person's average footprint in high income countries. (920 million people in 2001.)

= 1.9 ha.

Each person's average footprint in middle income countries. (2,971 million people in 2001.)

= 0.8 ha.

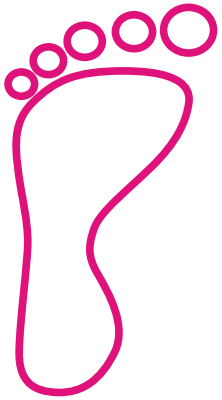
Each person's average footprint in low income countries. (2,226 million people in 2001.)

Estimates based on 2001 data. From: WWF *Living Planet Report 2004*

The Average American Ecological Footprint

= 1.8 ha.

Each person's fair earthshare in 2003.



= 9.6 ha.

The average footprint of U.S. citizens in 2003.

+

Human economies will only survive over the long-term if they are able to function within the carrying capacity of planet Earth.

The resources of 3 more planets would be needed for everyone in the world to live like Americans. The globalization of the American consumer society is not possible.

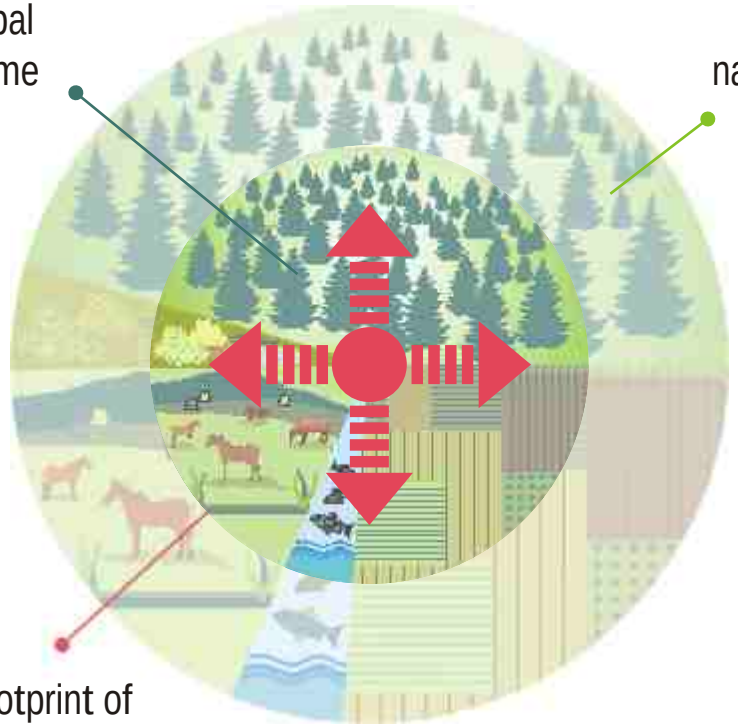
Estimates based on 2003 data. From: WWF *Living Planet Report 2006.*

Expansionist Worldview

relevant in1750 C.E.

Annual global natural income (interest)

Global natural capital (principal)



Resource footprint of global population smaller than annual available resources *sustainable*

Our expansionist economic model was developed at a time when there were unexplored frontiers. Natural resources seemed limitless.

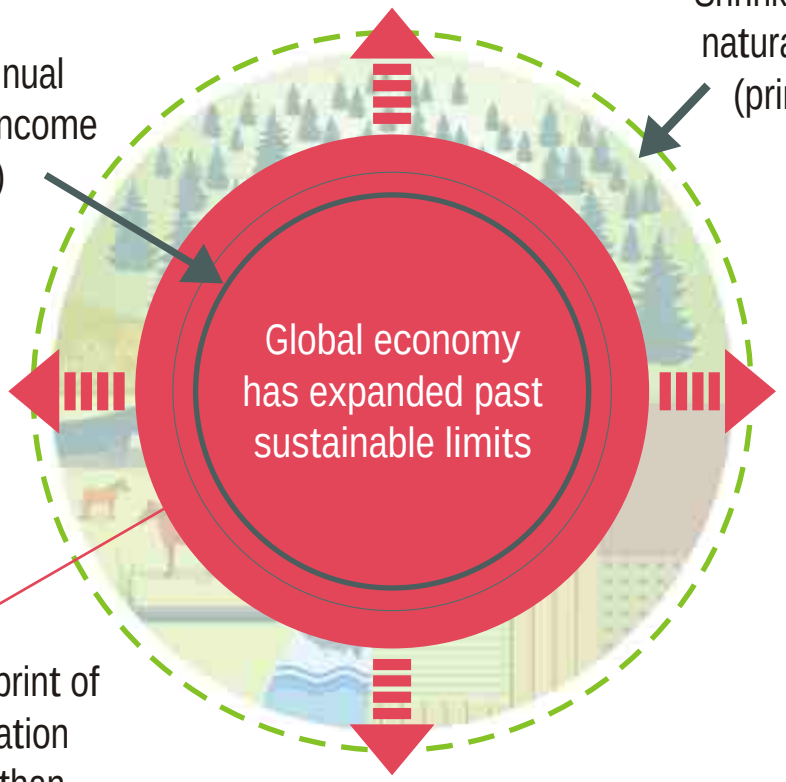
1750 C.E.

World population approx. 800 million
Agrarian civilizations still dominant
Beginning of Industrial Age

Diagram not to scale

Expansionist Worldview

not viable in 2000 C.E.



Globalization marks the end of unexplored terrestrial frontiers. An economic system based on limitless growth is no longer viable.

2006 C.E.

World population approx. 6.5 billion
Global industrial economy
Consumer culture

Diagram not to scale

Include and Transcend