Can the Human Race Survive the Human Race?

by

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Today’s Topics...

- Ecotrends: Are We On a Sustainable Course?
- Unsustainable Ethics
- Root Causes of Unsustainability
- Sustainable Development: What is it?
- Principles of Sustainability
"I am the ghost of environment future"
The road can be difficult and just when you make it to your destination, there’s another surprise waiting for you...
We’re often faced with difficult choices
But don’t worry... we’re Homo sapiens, the thinking men and women
Humanity, I love you...
On an average day in the world, the industrial nations release over 15 million tons of carbon dioxide, a greenhouse gas, into the atmosphere.
Global carbon dioxide emissions and global temperature.
FIGURE 6-22

Centuries-long deep circulation in the oceans is being deciphered by scientists. This global circulation mimics a vast conveyor belt of water drawing heat from some regions and transporting it for release in others.
If this is a typical day on planet Earth,

140 to 180 square miles of tropical rain forest will be cut down to provide wood, make way for farms, ranches, mines, and towns.
That’s equivalent to a swath 2 miles wide and 70 miles long.
Already over 3 million square miles of tropical rainforest have been destroyed--that's an area equivalent to have the size of the United States.
By various estimates, approximately 100 species become extinct each day, mostly as a result of tropical deforestation, wetland destruction, and loss of coral reefs.
If the historical rate of extinction were equivalent to a car traveling at 55 miles per hour.
Modern rate of extinction would be equivalent to a car traveling nearly 30 times faster, about 1600 miles per hour.
The difference between natural rates of extinction and present, human-influenced rates is analogous to the difference between a casual drive and mach 2.

Professor Dave Armstrong, University of Colorado, Boulder
Difficult as it is to accept, mass extinction has already begun, and the world is irrevocably committed to many further losses.

John Ryan
Worldwatch Institute
On a single day, nearly 70 million tons of topsoil are eroded from the world’s cropland.
Annually, that’s equivalent to 24 billion tons of topsoil...

Over a decade, that’s equivalent to 240 billion tons of topsoil...
Which is equivalent to about half the topsoil on U.S. farmland
On an average day, nearly 250,000 people join the world population...causing global population to increase by approximately 84 million a year.
Each one will require food, water, shelter, and a host of other resources to survive
Trends analysis

Survey of 25 U.S. environmental trends over a thirty-year period in air pollution, water consumption, waste production, energy demand, species extinction, habitat loss and more...
Findings:

Definite progress in several areas, such as carbon monoxide emissions, recycling, cropland erosion, and water consumption, indicating that in some areas we are moving toward a more sustainable state.
Despite this, the vast majority of the trends showed further slippage away from a sustainable future for us and our children...
Summary of Trends

- 20% of the trends showed significant improvement—moving us toward a more sustainable future.
- 10% of the trends showed no change—neither moving us toward or away from sustainability.
- 70% of the trends showed decline in environmental indicators—moving us clearly away from sustainability.
Neither toward nor away from sustainability

Toward sustainability
- Toxic release to environment
- Cropland erosion
- Recycling
- Agricultural pesticide use
- Particulate emissions

Volatile organic emissions
Carbon monoxide emissions
Cancer deaths

Away from sustainability
- Industrial energy consumption
- Renewable energy production
- Residential energy consumption
- Land in farms and harvested acreage
- Commercial energy consumption
- Transportation energy consumption and vehicle miles traveled
- Municipal solid waste consumption per capita
- Songbird and waterfowl: populations
- Wetlands
- Population growth
- Nitrogen oxide emissions

Total energy consumption
- Sulfur dioxide emissions
- Toxic release to surface water
- Forested land area
Most nations are treating the Earth as a corporation in liquidation...

Herman Daly
"One day, with the money made by industry we'll be able to clean up the environment"
Ecological Footprint

Are we living beyond the Earth’s carrying capacity?

According to Mathis Wackernagel, on average, humans require 5.6 acres of land to meet our needs for resources and waste assimilation...that’s our ecological footprint...but the Earth’s ecological capacity is only 4.5 acres per person.
We’re already living beyond the Earth’s means to support human life...
If all the world’s people lived like us (that’s U.S.), we’d need three more planets to sustain them...
From 1970 to 1994:

- U.S population grew by 27%
- Vehicle miles traveled grew by 111%
- GDP grew by 90%
- Yet, emissions of the criteria pollutants such as carbon monoxide and sulfur oxides decreased by 24%
Unsustainable development – robbing Peter to Pay Paul
Unsustainable Development

Meeting the needs of the present while foreclosing on future generations...
Unsustainable Ethics

Many people operate under a frontier ethic that is totally unsustainable in today’s world...
Frontier Ethics

- There’s always more, and it’s all for us
- Humans are apart from nature
- Success results from the domination and control of nature
If brute force doesn’t work, you’re not using enough of it!
The environment is the source of all our resources and the sink for all our wastes...
The environment is the biological infrastructure of our society...
Figure 1-8

BIOLOGICAL INFRASTRUCTURE (Infra-infrastructure)

- Wood and paper
- Iron, aluminum, and copper
- Water
- Food

HUMAN INFRASTRUCTURE

Influx of materials into the city

Infrastructure and Infra-Infrastructure. The Earth and the environment provide fuel for the economy and furnish the needs of human society.
The environment is the source of all our wealth...
Far from being an impediment to progress, environmental protection is a precondition for our long-term economic success
Space-time values. Graph of people’s hypothetical spatial and temporal interests, indicated by the points. Most individuals tend toward the lower end of the
Exponential growth in savings. This graph plots the growth
Can the Human Race Survive the Human Race?
Who says we don’t know what we’re doing?
Sustainable Development

Development that meets the needs of the present without compromising the ability of future generations to meet their needs

World Commission on Environment and Development
Sustainable development implies ways of living well and improving our lives that do not undermine our future, the future of our children, and all living things...
What is Sustainability?

A relationship between dynamic human economic systems and larger dynamic ecological systems in which (1) human life can continue indefinitely; (2) human individuals can flourish; (3) human cultures can develop; but in which (4) the effects of human activities remain within the bounds, so as not to destroy the diversity, complexity, and function of the ecological support system.

Robert Costanza, Ecological Economist
Sustainable Development

Sustainable development ensures present and future generations the ability to satisfy a wide range of needs – food, shelter, clothing, recreation, education, employment, health, freedom from harm, etc. – forever.
Sustainable Solutions. For many years, social, economic, and environmental issues were addressed...
Creating a better world for ourselves, our children, and their children
And the millions of species that share this planet with us
What’s good for the environment is good for the economy and good for people, too
Principles of Sustainable Design

- Directive principles -- social, economic, and environmental principles
- Operating principles – putting directive principles into action
Directive Principles
Social, economic, and environmental guidelines

- Limits to growth
- Living within the Earth’s carrying capacity
- Human dependence on nature
- Interdependence – nature depends on us
Directives Principles
Social, economic, and environmental guidelines

- Intergenerational equity
- Ecological justice
- Development that meets the needs of people
- Limits to the market
- Greater local and regional self-reliance
Directive Principles

Social, economic, and environmental guidelines

- Participation and cooperation
- Freedom from oppression
- National security is tied to ecological integrity
- Root-level solutions
- Systems view
Limits

There are very real limits — limits to freshwater supplies, the amount of pollution streams and lakes can handle, the amount of pollution our atmosphere can absorb, the amount of fish in the ocean, and so on.
Local Limits

Limits to the amount of water that can be removed from a stream or the amount of housing in a valley, or the amount of backpacking and hiking that can occur in wilderness areas...
Westword

WELL WISHERS

Douglas County is running out of groundwater—but its river of development schemes is flowing strong.

By Stuart Steers

Mackbeat: Motörhead’s Lemmy hits 50 as hard as he can

The power of HIV-positive thinking: A Denver foster mom adopts a brave attitude.

By Steve Jackson

Movies:
Richard III—the original tricky Dick
in a poetic update

City Limits:
They’re really getting ugly in L.A.!
Prospering Within Limits

Long-term sustainability is achieved when citizens guide development according to the carrying capacity of the planet...
Dependence

Nature is the biological
infra-infrastructure or
of modern society...
Dependence

The Earth and natural systems form the life support system of the planet...providing a vast array of goods and services essential to our personal and economic well being...
Interdependence...

The fate of the environment is in our hands...
Planet care is the ultimate form of self care...
Intergenerational Equity

Intergenerational equity – fairness to future generations

All generations are stakeholders in the present
Ecological Justice

All species have a right to the Earth’s bounty...
Local and Regional Self-Reliance

Relying on local resources and other measures to create more self-sufficient local and regional economies helps promote greater economic stability and improve environmental stewardship.
Development that Meets the Needs of People

Gear development to the true social, economic, and environmental needs of our citizenry.
Development That Meets the Needs of a Community

Local development often puts us on an economic treadmill
Limits to the Market

- Sends false signals of wealth — GDP
- Blind to long-term resource supplies
- Based on false presumptions — endless expansion of resource supplies as prices increase (Infinite substitutability of human and natural capital)
Root-Level Solutions

To solve our problems, we must understand and address the root causes... Treat the disease not the symptoms.
Figure 1: Root Causes of the Environmental Crisis. Progress toward sustainability requires efforts to address the underlying causes of the environmental crisis, not merely the symptoms. By doing so, we can work toward a more sustainable future for all.
Root causes of the Environmental Crisis. Many factors contribute to the environmental crisis. They interact in many ways to produce a socioeconomic system that threatens its own existence.
Systems Approach

Creating sustainable systems is essential to creating an enduring human presence...
Participation

Sustainable development will require participation and cooperation from all sectors – individuals, business community, and government
How do we create a sustainable society?

How do we operationalize or manifest the directive principles?
The biological principles of sustainability...

Conservation
Recycling
Renewable Resources
Restoration
Population Control
Adaptability
Conservation

Natural systems are sustainable because organisms typically use what they need and use it efficiently.
Stuart Carlson

I will do whatever it takes to make America more energy self-sufficient. I will go anywhere, pay any price, bear any burden to free the U.S. from the whims of tyrannical Mideast oil barons!!

EXCEPT THAT!

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Recycling

Natural systems are sustainable because all waste is recycled...

New generations are built on the remains of preceding ones.
Renewable Resources

Natural systems are sustainable because they rely principally on renewable resources: air, water, soil, and plants.
Restoration

Natural systems are sustainable because damage organisms create is typically restored by natural mechanisms.
Population Control

Natural systems persist because organisms remain within limits by various population control mechanisms.
Adaptability

Natural systems have sustained themselves over millennia because organisms can adapt to change.
The power of man has grown in every sphere, except over himself.

Winston Churchill
Applying biological principles of sustainability to human systems
Man must go back to nature for information.

Thomas Paine
Nature is the master of sustainability
Just as any technology of flight, no matter how primitive or advanced, must abide by the basic principles of aerodynamics, so must a lasting society satisfy basic ecological principles.

Lester Brown
Worldwatch Institute
It’s the Systems stupid!

Air pollution, habitat loss, species extinction, and other social and environmental problems are not the problem...they’re only symptoms of a deeper, underlying problem.
It's the systems! Air pollution, water pollution, waste, and species extinction are symptoms of overpopulation and unsustainable human systems. Redesigning these systems could help reduce many of the symptoms of the environmental crisis and put us back on a sustainable course.
The Symptoms Approach

Actions to solve problems...
Lead to
Reduction of symptoms
Reduces action to solve the problem
Re-emergence of the problem...
The Systems Approach

Offers the best hope for eliminating problems that plague our communities and erode our long-term prospects...
Performance vs Sustainability

Just because our systems seem to be performing adequately, doesn’t mean they are sustainable in the long run...
The Challenge

The challenge is two-fold: to revamp existing infrastructure and redirect new growth and development applying the principles of sustainability
Human systems. Our lives depend on a variety of systems, such as waste management, transportation, energy, and agriculture. Note that some systems provide inputs needed to make others run. All systems produce waste, handled by our waste management system.
Most Human Systems are Unsustainable

- They’re inefficient and wasteful of resources
- The recycle little of the waste they produce
- They use very little recycled material
Human systems. Our lives depend on a variety of systems, such as waste management, transportation, energy, and agriculture. Note that some systems provide inputs needed to make others run. All systems produce waste, handled by our waste management system.