

UMFK ENVIRONMENTAL SPEAKER SERIES

Economic Growth in a Sustainable Development Context

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Overview

- A brief introduction
- The Current Situation & **THE PROBLEM**
 - Defining Sustainable Development
 - Economic growth as a requirement for sustainable development – Our Common Future
- The Responses from the Economists
 - Neoclassic Response –Solow
 - Economics and Energy –Georgescu-Roegen
 - Steady-State Economy – Mills and Daly
 - Degrowth – Latouche and Alier

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BUSINESS

FINANCIAL POST

U.S. shoppers spark hope Markets cheer return of the voracious U.S. consumer

BY DAVID PETT AND HOLLIE SHAW, FINANCIAL POST NOVEMBER 29, 2011

Tuesday, August 24, 2010 As of 12:23 PM New York 68° | 56°

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Tuesday November 29, 2011 [Past Iss](#)

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MONEY & INVE



Black Friday Leads to Green Monday C1

Stocks posted their biggest single-day gain in a month, as euro-zone leaders worked to stem the debt crisis and a strong holiday sales boosted the retail sector.

- [Heard: Thinking the Euro Unthinkable](#)
- [MarketBeat: Europe's Trade of the Decade](#)
- [Euro Rises | Treasuries Pare Losses](#)

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Herman Cain re-assessing candidacy



Perry gets voting age wrong



Maxi for M

Asia could help drive global economic growth, Fed official says

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By Neil Irvin, Updated: Tuesday, November 29, 1:25 PM

SAN FRANCISCO — Americans are weighed down by debt, and Europe is in crisis. So Asian nations need to step up and encourage their citizens to spend so that they can help drive global economic growth, a senior Federal Reserve official said Tuesday.

The message



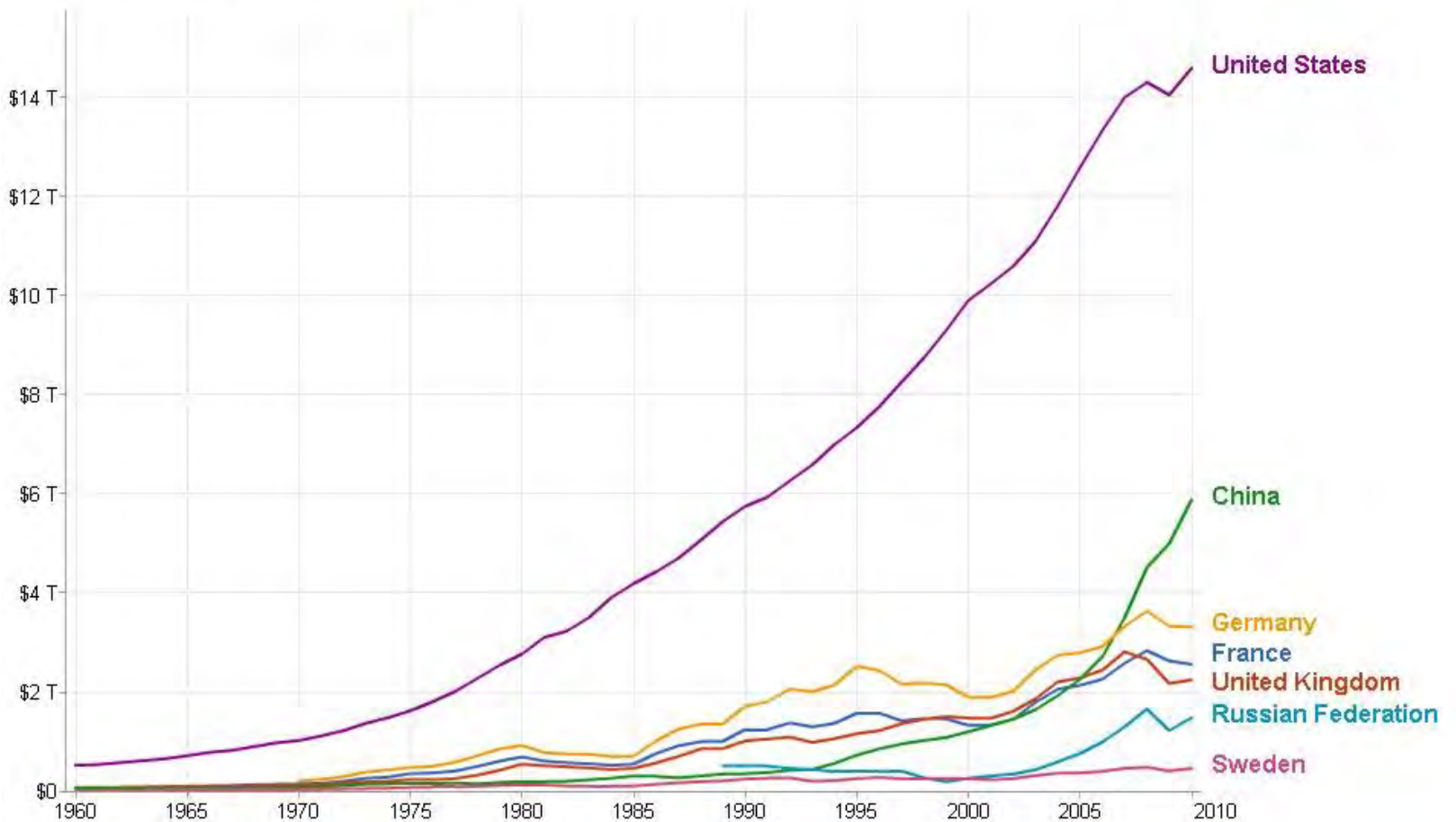
Source: <http://thepixelwatch.com/>

= Good



Why?

Gross Domestic Product ②



THE PROBLEM

$$Y = AL^{\alpha}K^{\beta}$$

Y = Total production

A = Total factor productivity

L = Labor input

K = Capital (resource) input

α & β = Output elasticities

determined by available technologies

Two ways to Grow Y;

1. Increase inputs L and K
2. Increase Productivity A

Function validated using data from 1900-47

Sustainable Development

- Term originated after publication of ***Limits to Growth*** by D. Meadows et al in 1972
 - Commissioned by Club of Rome

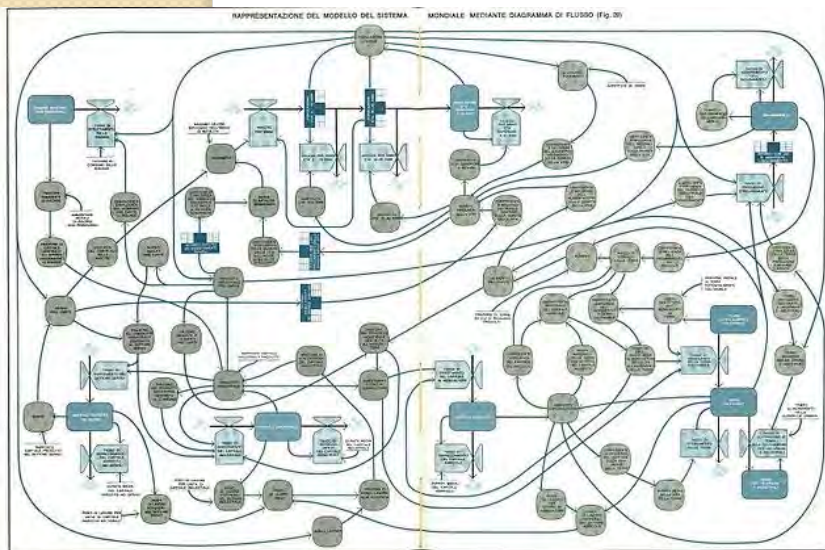
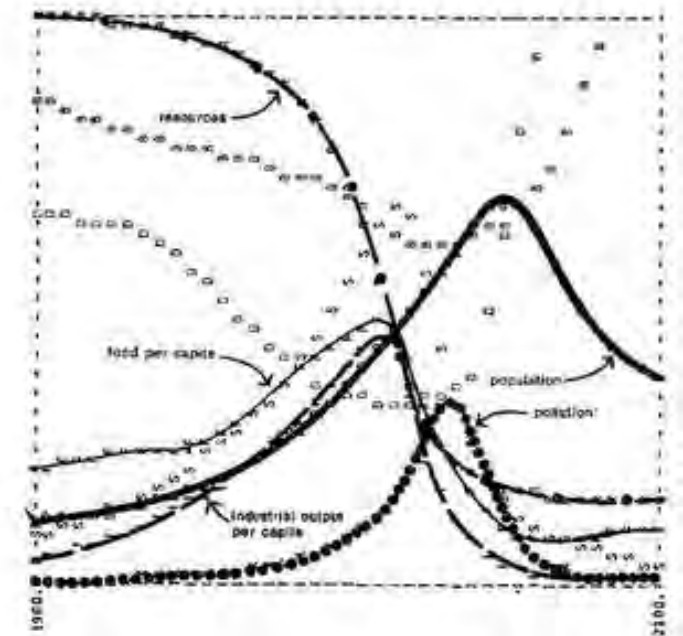


Figure 35 WORLD MODEL STANDARD RUN





Defining Sustainable Development

- 1992 World Bank Report ***Sustainable development concepts*** by John Pezzey documented over 40 different definitions in the peer-reviewed literature
- Common themes
 - environmental concerns
 - the plight of the world's poor
 - a social responsibility to future generations

Brundtland Commission (1987)

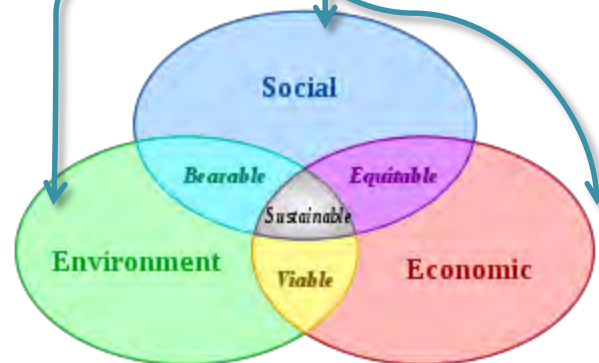
- Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

It contains within it two key concepts:

- the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

Key Statements in *Our Common Future*


- From Chairman Gro Harlem Brundtland
 - *Environmental degradation, first seem as mainly a problem of the rich nations and a side effect of industrial wealth, has become a survival issue for developing nations. It is part of the downward spiral of linked ecological and economic decline in which many of the poorest nations are trapped.*
 - *The downward spiral of poverty and environmental degradation is a waste of opportunities and of resources. In particular, it is a waste of human resources. These links between poverty, inequality, and environmental degradation formed a major theme in our analysis and recommendations. **What is needed now is a new era of economic growth – growth that is forceful and at the same socially and environmental sustainable.***





Defining growth in ***Our Common Future***

- Economic growth essential to eliminating poverty
- Based on sustaining and expanding the resource base
- Non-absolute limits of
 - Technology
 - Social organization on environmental resources
 - Biosphere ability to absorb waste
- Growth must be more energy efficient than in the past.



Some growth metrics from ***Our Common Future***

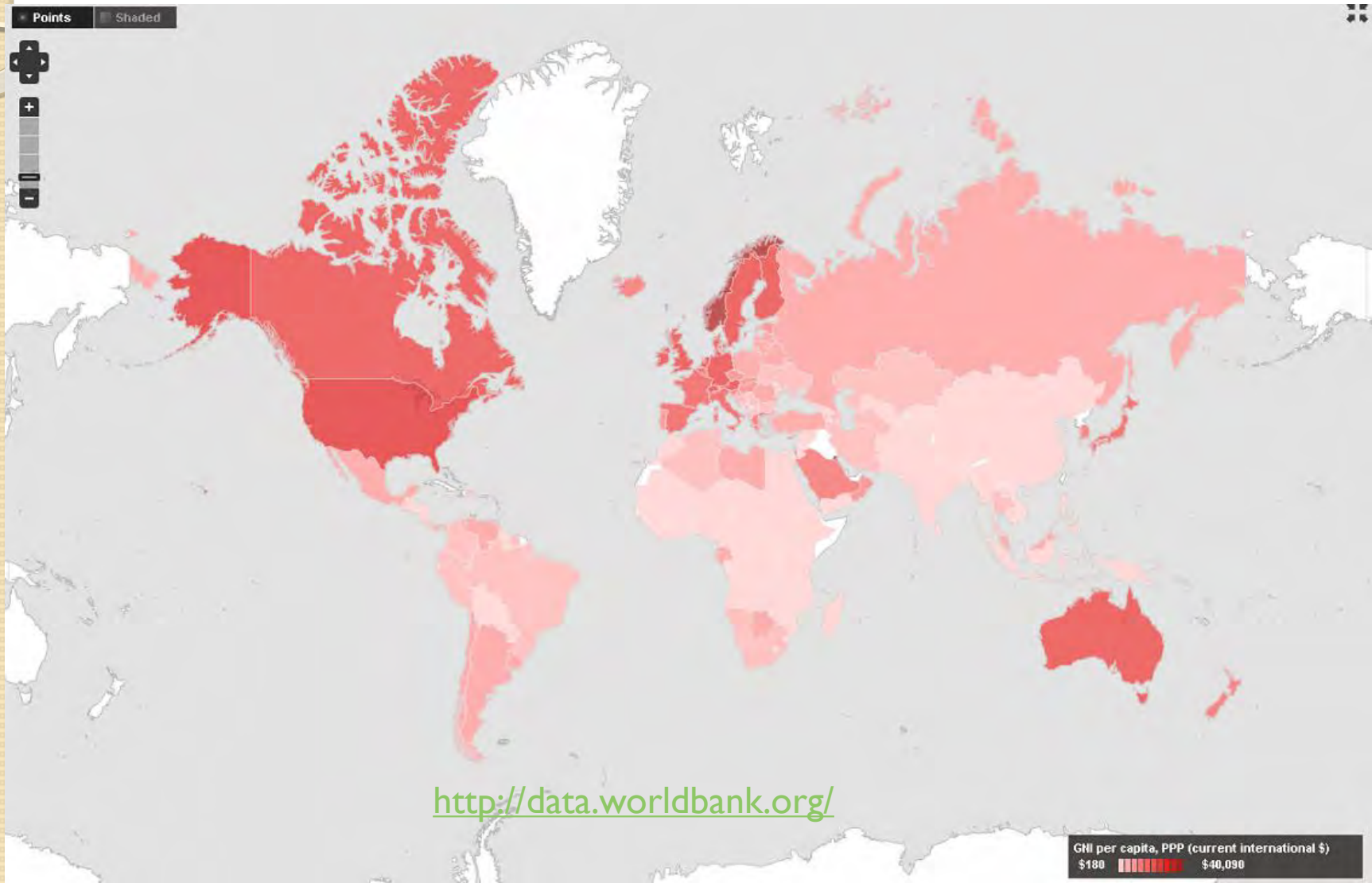
- Economic growth defined as increase in per capita income (GNI per capita)
- Less developed nations
 - In Asia → 5%
 - In Latin America → 5.5%
 - In Africa and West Asia → 6%
- Industrialized nations → 3-4%



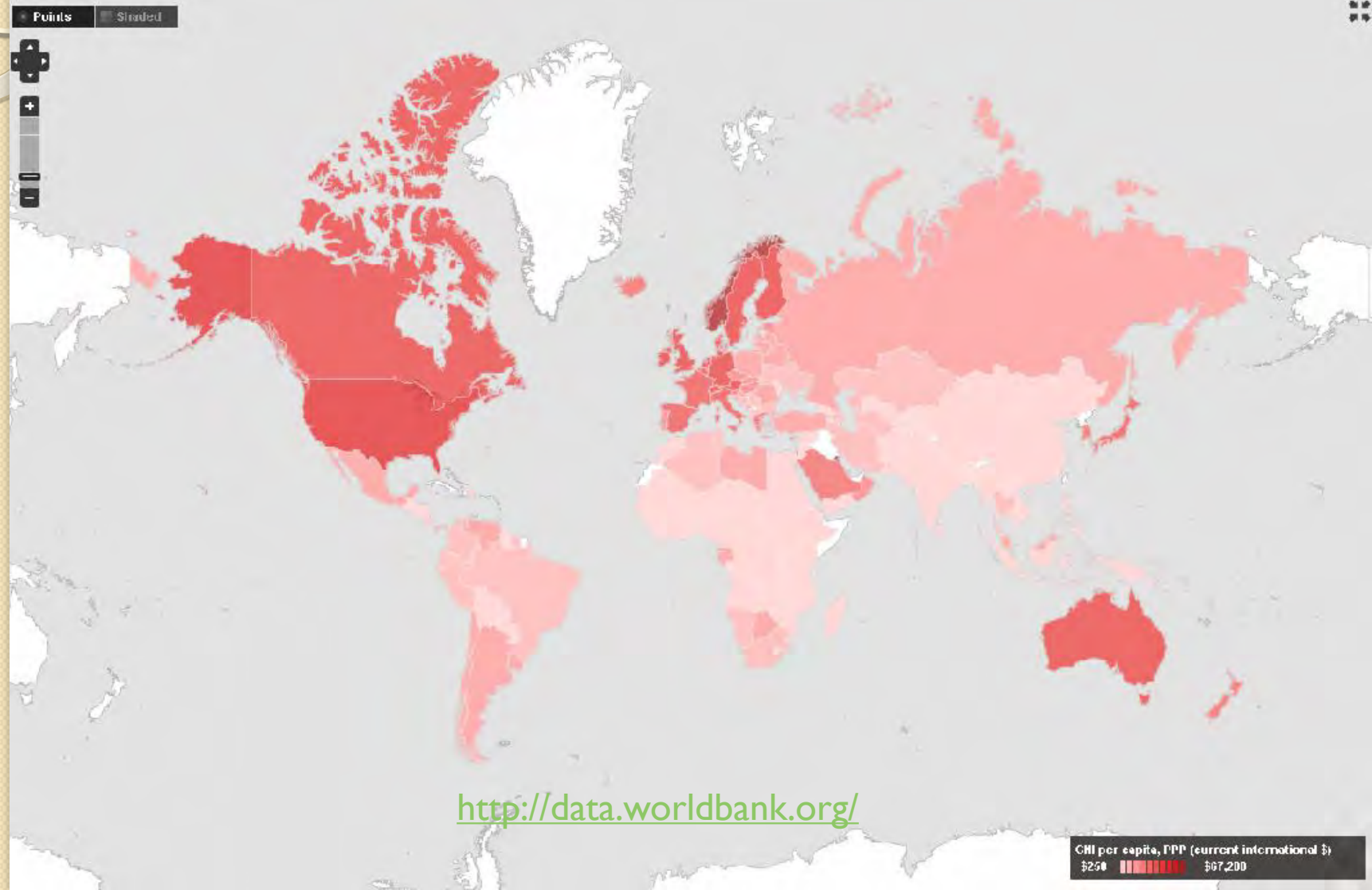
Intent of growth in ***Our Common Future***

- Industrialized countries invest in less developed nations to decrease global income inequities
 - Globalization & Free Trade
- Growth should be dematerialized and energy efficient

GNI per capita, PPP (current international \$) 1986 -1990



GNI per capita, PPP (current international \$) 2006-2010



Robert Solow, Nobel Laureate (born 1924, Nobel Prize in 1987)



Picture by Olaf Solow

Solow thoughts On SD

- “an injunction not to satisfy ourselves at the expense of future generations”
- (infinite) Substitutability of production capital
 - “The world does not need natural capital”
- Distributional equity, present and future
 - Saving or investment
 - Current consumption or providing for the future
- Must account for rents on nonrenewable resources

Solow steps towards Sustainability

- GDP and GNP are “incomplete” for measuring well-being
 - No depreciation of capital resources
- NNP (GDP – depreciation) does not measure degradation or stewardship
- Must account for depleting non-renewable natural resources (NNR)
 - A deduction from NNP for depletion of NNR



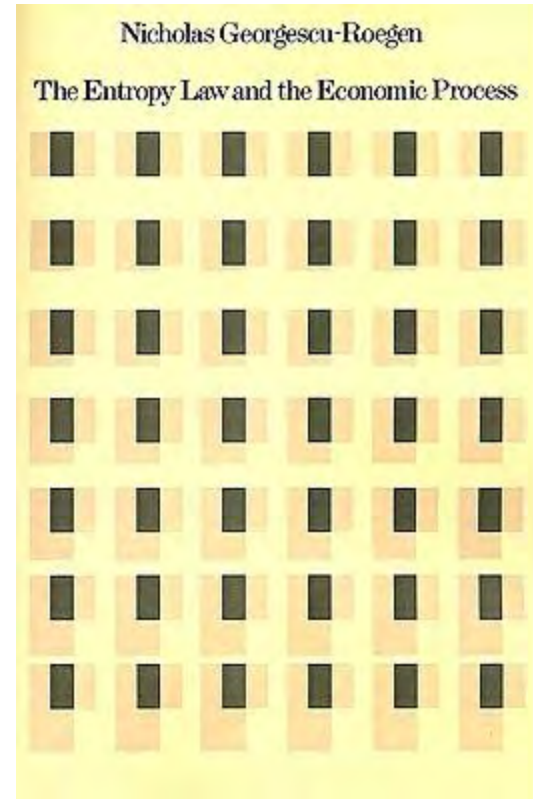
Solow's quote to approaching sustainability:

“Yes-or-no lends itself to stalemate and confrontation; more-or-less lends itself to trade-offs”

Nicholas Georgescu-Roegen (1906-1994)



<http://steadystate.org/discover/definition/>



Published in 1971

Georgescu-Roegen Contribution

- Applied thermodynamic properties to the economy
 - Defines economics as a function of energy
 - Energy subject to entropy laws
- Theorized a 4th law of thermodynamics...entropy for matter
- Based on 4th law there can be no steady state or growth economy since both energy and matter degrade over time

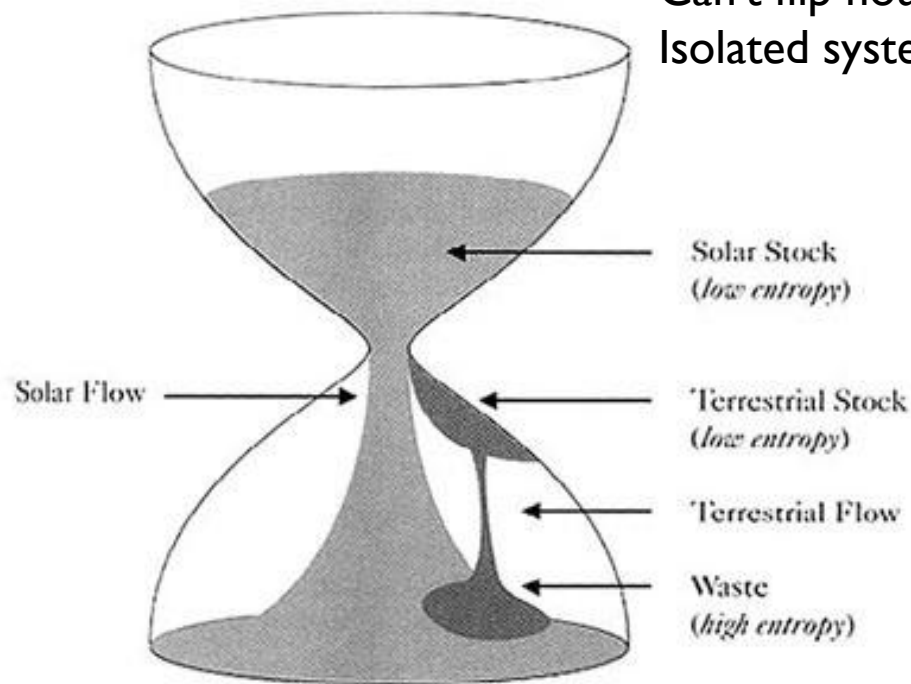
Georgescu-Roegen's Hourglass

Fixed amount of sand – 1st law of thermo

Sand flows from top to bottom – 2nd law of thermo

Can't flip hourglass – 2nd law of thermo

Isolated system – no sand enters, no sand leaves



Energy determines economic growth, the question is how big is the hourglass and how fast is it emptying?

GR's answer

(from **Energy and Economic Myths**)

- War and all its instruments should be prohibited
- The standard of living in poorer nations should rise
- Population should shrink to level supportable by organic farming
- Use Solar energy or controlled fusion, no energy waste allowed
- End extravagance ...
- Get rid of fashion
- Make durable goods more durable and repairable
- A good life is increasing amount of leisure spent in an intelligent manner

Herman Daly (born 1938)



<http://www.publicpolicy.umd.edu/directory/daly>



Steady-State economy

- The economy is an open system within a closed biophysical system
 - Growth is limited
 - There is an optimum scale at where growth stops
- Difference between growth and development
 - Growth is quantitative expansion
 - Development is qualitative improvement



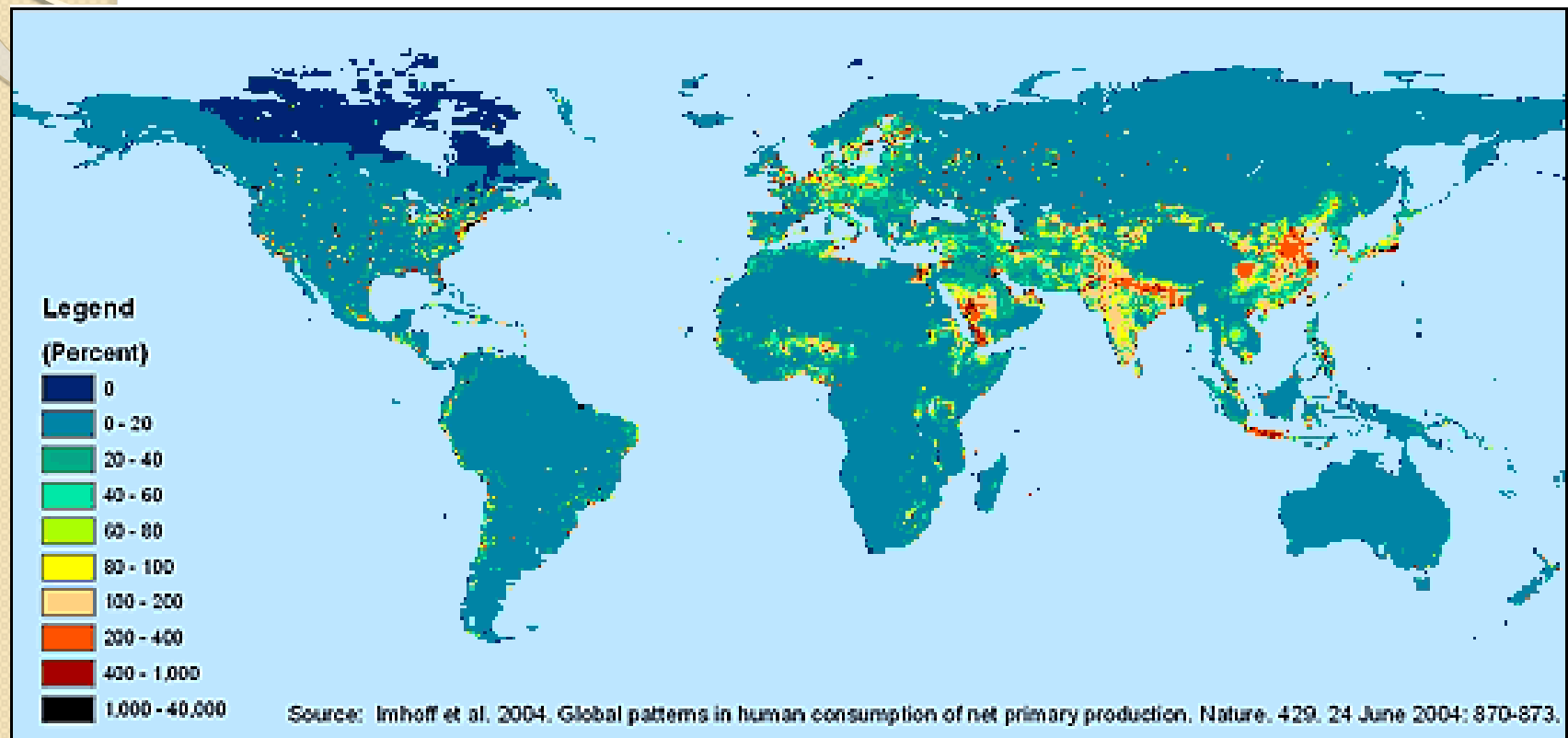
Daly Limits to growth

- Scale of human activity within Carrying Capacity of the earth
- Renewable resources exploited at regeneration rates
- Non-Renewable exploited at rate of replacement of equivalent renewable resources
- Technology should be efficiency oriented and not throughput oriented

Sustainable growth is an Oxymoron

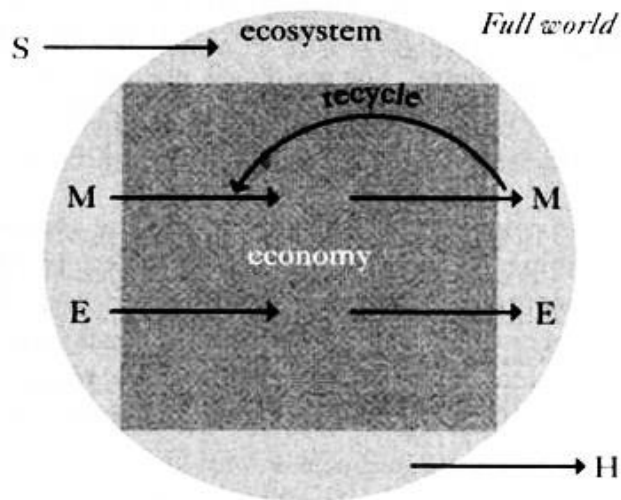
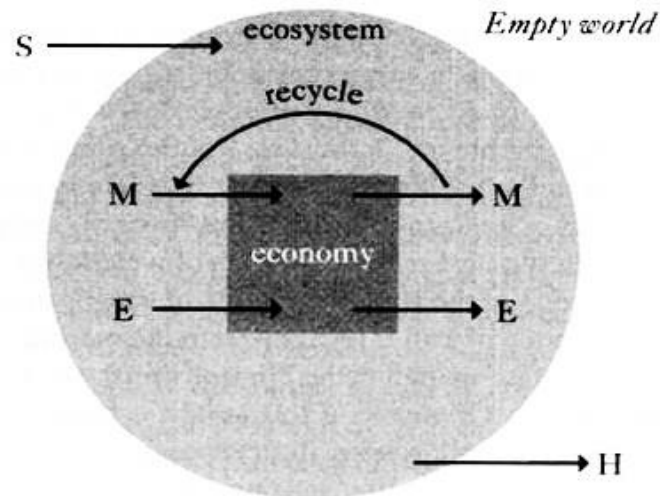
- Sustainable development is development without growth
- Growth is limited by Human Appropriation of Net Primary Product of Photosynthesis, NPP
 - Peter Vitousek, Paul R. Ehrlich, Anne H. Ehrlich and Pamela Matson (1986)
 - 5 billion people (1986) → 40% of terrestrial NPP
 - By extrapolation, 12.5 billion → 100%
 - Currently population is 6.8 billion

2004 → 6.4 million people



<http://sedac.ciesin.columbia.edu/es/hanpp.html>

Figure 3. *The economy as an open subsystem of the ecosystem*




S = solar energy

H = heat

M = matter

E = energy

 man-made capital

 natural capital

From ***Beyond Growth*** by
Herman Daly Page 48

Serge Latouche



Source: <http://winecountry.it/articles/trade-shows-and-events/1319>

De-Growth <> Décroissance

- From France
 - some acceptance in Italy and Belgium
- “Think globally, *act locally*” – Serge Latouche
- Anti-capitalist, tyranny of growth
- Rebound effects –any gains in efficiency are cancelled by increases in consumption
- “Economic growth is NOT environmentally sustainable” – Joan Martinez-Alier



3 Level of the Economy

- Top level – provides loans, borrowing against the future growth of the economy, produces “virtual wealth”
- Real economy – industry, innovation, technology, manufacturing –subject to leverage by top level –must grow to satisfy debt
- Real-real economy – flow of energy and materials – resource and sink limited

De-Growth <> Décroissance

But degrowth is not just a quantitative question of doing less of the same, it is also and, more fundamentally, about a paradigmatic re-ordering of values, in particular the (re)affirmation of social and ecological values and a (re)politicisation of the economy. It aims to take us out of the economy, of the domain of the calculable and economic rationality, and ask fundamental questions about the nature of wealth, its distribution, its use, and misuse. Thus degrowth is not just a quantitative question of producing and consuming less, but a tool proposed for initiating a more radical break with dominant economic thinking. -- Valerie Fournier in *Escaping from the economy: the politics of degrowth*

La Décroissance,
c'est la joie de vivre.

Conclusion

The current economic growth models will NOT lead to a sustainable planet, we are robbing the future to grow the present at the expense of the poorest among us

Presented 3 competing viewpoints for economic growth within a sustainable development context

- Neoclassic (Keynesian) – dematerialized growth required to eliminate poverty and reduce environmental degradation
- Steady State – economic growth has limits determined by biosphere
- Degrowth – who cares?...its not about growth or economics but about the quality of life

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