The word "sustainable" is unsustainable.

Frequency of use of the word "sustainable" in US English text, as a percentage of all words, by year.

Source: Google Ngrams

2036: "Sustainable" occurs an average of once per page.

2061: "Sustainable" occurs an average of once per sentence.

2109: All sentences are just the word "sustainable" repeated over and over.

The word "sustainable" is unsustainable.
The world is a complex, non-linear, adaptive system, with thresholds, tipping points, and surprises.

From Lenton et. al. 2008
PEAK OIL: THERE ARE FUNDAMENTAL RESOURCE CONSTRAINTS

Net Energy from Oil and Gas Liquids

From Campbell 2004
PLANETARY BOUNDARIES: THERE ARE FUNDAMENTAL ECOLOGICAL CONSTRAINTS


We need a *third* movie...
We need a third movie...

A sustainable and desirable economy-in-society-in-nature
Building a Sustainable and Desirable Economy-in-Society-in-Nature,

by: United Nations Department of Economic and Social Affairs (UNDESA)

This report is a synthesis of ideas about what a new economy-in-society-in-nature might look like and how we might get there. The report argues that now is the right time for the transition to a new economic paradigm. It lays out a vision, objectives and concrete policies that could underpin a new model of the economy based on the worldview and principles of "ecological economics," including sustainable scale, equitable distribution and efficient allocation - a model where GDP growth is not the ultimate goal. The report makes a case for a greatly expanded commons sector of the economy and new common asset institutions to adequately deal with natural and social capital assets.

On 19 July last year, 68 countries joined the Kingdom of Bhutan in co-sponsoring a resolution titled “Happiness: Towards a holistic approach to development,” which was adopted by consensus by the 193-member UN General Assembly.

In follow up to the resolution, the Royal Government of Bhutan is convening a High Level Meeting on “Happiness and Well Being: Defining a New Economic Paradigm” on 2nd April 2012 at the United Nations headquarters in New York.
"Empty World" Vision of the Economy

- Property rights
  - Private
  - Public

- Perfect Substitutability Between Factors
  - Capital (Built)
  - Labor
  - Land

- Building
- Education, Training, Research
- Improvement

- Economic Process

- Investment
- Consumption

- Individual Utility/welfare
- Cultural Norms and Policy

- Goods and Services
- GDP
“Full World” Vision of the Whole System

- Solar Energy
- Natural Capital
- Human Capital
- Social Capital
- Built Capital
- Economic Production Process
- Goods and Services
- Wastes
- Ecological services/amenities
- Well Being (Individual and Community)
- Consumption (based on changing, adapting preferences)
- Investment (decisions about, taxes, community spending, education, science and technology policy, etc., based on complex property rights regimes)
- Built Capital
- Complex property rights regimes
- Negative impacts on all forms of capital
- Materially closed earth system
- Restoration, Conservation, Education, training, research, Institutional rules, norms, etc.
- Building
- GDP
Quality of Life

Opportunities to meet human needs, now and in the future (Built, Human, Social, and Natural Capital and time)

Policy

Envisioning, evolving social norms

Human Needs
- Subsistence
- Reproduction
- Security
- Affection
- Understanding
- Participation
- Leisure
- Spirituality
- Creativity
- Identity
- Freedom

Subjective Well-Being (happiness, utility, welfare) for individuals and/or groups

How Needs are Met

How Need Fulfillment is Perceived
Ecosystem Services: the benefits humans derive from functioning ecosystems.
Welcome to the new ESP website
Several pages and functionalities are still under construction or are being updated. If you have any suggestions please contact ESP Support Team.

ESP Services
- Networking & Outreach
- Case studies & Showcases
- Data & Knowledge sharing
- Training and Education
- Guidelines & Toolkits
- Funding/Cooperation calls

ESP Activities and Networks
- Thematic Working Groups
- Biome Expert Groups
- National ESP Networks

Contact
Support & FAQ
Members & Partners
Become a Member
<table>
<thead>
<tr>
<th>Use of Valuation</th>
<th>Appropriate values</th>
<th>Appropriate spatial scales</th>
<th>Precision Needed</th>
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<td>Total values, macro aggregates</td>
<td>Regional to global</td>
<td>low</td>
</tr>
<tr>
<td>National Income and Well-Being Accounts</td>
<td>Total values by sector and macro aggregates</td>
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<td>medium</td>
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<tr>
<td>Specific Policy Analyses</td>
<td>Changes by policy</td>
<td>Multiple depending on policy</td>
<td>medium to high</td>
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<td>Changes by land use scenario</td>
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<td>low to medium</td>
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<tr>
<td>Payment for Ecosystem Services</td>
<td>Changes by actions due to payment</td>
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<td>Full Cost Accounting</td>
<td>Total values by business, product, or activity and changes by business, product, or activity</td>
<td>Regional to global, given the scale of international corporations</td>
<td>medium to high</td>
</tr>
<tr>
<td>Common Asset Trusts</td>
<td>Totals to assess capital and changes to assess income and loss</td>
<td>Regional to global</td>
<td>medium</td>
</tr>
</tbody>
</table>
What we do

Trucost has been helping companies, investors, governments, academics and thought leaders to understand the economic consequences of natural capital dependency for over 12 years.

Our world leading data and insight enables our clients to identify natural capital dependency across companies, products, supply chains and investments; manage risk from volatile commodity prices and increasing environmental costs; and ultimately build more sustainable business models and brands.

Key to our approach is that we not only quantify natural capital dependency, we also put a price on it, helping our clients understand environmental risk in business terms.

It isn't "all about carbon"; it's about water; land use; waste and pollutants. It's about which raw materials are used and where they are sourced, from energy and water to metals, minerals and agricultural products. And it's about how those materials are extracted, processed and distributed.
# Input-Output Framework for Classifying, Measuring and Valuing Ecosystem Services

## Economic Sectors

- **Direct Inputs to Economic Sectors**
- **Indirect Marketed Ecosystem Services**
- **Direct Non-Market Ecosystem Services**

## Ecosystems

- **Households, Government, Net Exports**
- **Negative Impacts on Ecosystems**

---

### Economic Sectors

- Network of economic sectors indicating flow of goods and services.

### Ecosystems

- Network of ecosystems indicating flow of products and impacts.

---

### Relationships

- Arrows represent the movement of goods and services between economic sectors and ecosystems.
- Blue arrows indicate direct and indirect flows of marketed ecosystem services.
- Red arrows indicate negative impacts on non-marketed ecosystem services.

---

### Key Points

- The framework integrates economic and ecological flows to enhance understanding of ecosystem services.
- It highlights the importance of considering both marketed and non-marketed services in economic analysis.

---

### Further Reading

- **Source Material**: [Input-Output Analysis in Environmental Economics](https://environmental-economics.com/input-output-analysis/)
- **Related Frameworks**: [Circular Economy](https://circulareconomy.com/)

---

**Note:** The diagram is a conceptual representation to illustrate the complexities of ecosystem services within an economic framework.
Citation Report  Topic=\("\text{ecosystem services}\")
Timespan=All Years.

This report reflects citations to source items indexed within All Databases.

Published Items in Each Year

Citations in Each Year

Results found: 7777
Sum of the Times Cited [?] : 78693
Sum of Times Cited without self-citations [?] : 60134
Citing Articles [?] : 45113
Citing Articles without self-citations [?] : 41442
Average Citations per Item [?] : 15.52

h-index [?] : 113

The latest 20 years are displayed.
View a graph with all years.
The value of the world’s ecosystem services and natural capital

Robert Costanza, Ralph d’ Arge, Rudolf de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert V. O’Neill, Jose Paruelo, Robert G. Raskin, Paul Sutton & Marjan van den Belt

The services of ecological systems and the natural capital stocks that produce them are critical to the functioning of the Earth’s life-support system. They contribute to human welfare, both directly and indirectly, and therefore represent part of the total economic value of the planet. We have estimated the current economic value of 17 ecosystem services for 16 biomes, based on published studies and a few original calculations. For the entire biosphere, the value (most of which is outside the market) is estimated to be in the range of US$16–54 trillion ($10^{12}$) per year, with an average of US$33 trillion per year. Because of the nature of the uncertainties, this must be considered a minimum estimate. Global gross national product total is around US$18 trillion per year.
# Summary of global values of annual ecosystem services

(From: Costanza et al. 1997)

<table>
<thead>
<tr>
<th>Biome</th>
<th>Area (e6 ha)</th>
<th>Value per ha ($/ha/yr)</th>
<th>Global Flow Value (e12 $/yr)</th>
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<td>3.8</td>
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<td>0.9</td>
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<td>Cropland</td>
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<tr>
<td><strong>Total</strong></td>
<td>51,625</td>
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<td>33.3</td>
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</table>
Global estimates of the value of ecosystems and their services in monetary units

Rudolf de Groot\textsuperscript{a,}\textsuperscript{*}, Luke Brander\textsuperscript{b,1}, Sander van der Ploeg\textsuperscript{a}, Robert Costanza\textsuperscript{c}, Florence Bernard\textsuperscript{d}, Leon Braat\textsuperscript{e}, Mike Christie\textsuperscript{f}, Neville Crossman\textsuperscript{g,h}, Andrea Ghermandi\textsuperscript{i}, Lars Hein\textsuperscript{a}, Salman Hussain\textsuperscript{j}, Pushpam Kumar\textsuperscript{k}, Alistair McVittie\textsuperscript{j}, Rosimeiry Portela\textsuperscript{l}, Luis C. Rodriguez\textsuperscript{g,h}, Patrick ten Brink\textsuperscript{m}, Pieter van Beukering\textsuperscript{b}
Figure S1. Map of global annual ecosystem services based on 2011 land areas and 2011 unit values

<table>
<thead>
<tr>
<th>LandCover</th>
<th>Flow Value per Hectare per year</th>
<th>Legend</th>
<th>Area (millions of hectares)</th>
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<tr>
<td>Ice/Rock</td>
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<td></td>
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<tr>
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<td>1997</td>
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<td>2007$/ha/yr</td>
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Table 3. Changes in area, unit values and aggregate global flow values from 1997 to 2011 (green are values that have increased, red are values that have decreased)

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<td>1,258</td>
<td>-642</td>
<td>2,769</td>
<td>5,382</td>
<td>2,613</td>
<td>5.3</td>
<td>10.2</td>
<td>3.5</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td>Temperate/Boreal</td>
<td>2,955</td>
<td>3,003</td>
<td>48</td>
<td>417</td>
<td>3,137</td>
<td>2,720</td>
<td>1.2</td>
<td>9.3</td>
<td>1.3</td>
<td>9.4</td>
<td></td>
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<tr>
<td>Grass/Rangelands</td>
<td>3,898</td>
<td>4,418</td>
<td>520</td>
<td>321</td>
<td>4,166</td>
<td>3,845</td>
<td>1.2</td>
<td>16.2</td>
<td>1.4</td>
<td>18.4</td>
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<tr>
<td>Wetlands</td>
<td>330</td>
<td>188</td>
<td>-142</td>
<td>20,404</td>
<td>140,174</td>
<td>119,770</td>
<td>6.7</td>
<td>36.2</td>
<td>3.4</td>
<td>26.4</td>
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<tr>
<td>Tidal Marsh/Mangroves</td>
<td>165</td>
<td>128</td>
<td>-37</td>
<td>13,786</td>
<td>193,843</td>
<td>180,057</td>
<td>2.3</td>
<td>32.0</td>
<td>1.8</td>
<td>24.8</td>
<td></td>
</tr>
<tr>
<td>Swamps/Floodplains</td>
<td>165</td>
<td>60</td>
<td>-105</td>
<td>27,021</td>
<td>25,681</td>
<td>-1,340</td>
<td>4.5</td>
<td>4.2</td>
<td>1.6</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Lakes/Rivers</td>
<td>200</td>
<td>200</td>
<td>0</td>
<td>11,727</td>
<td>12,512</td>
<td>785</td>
<td>2.3</td>
<td>2.5</td>
<td>2.3</td>
<td>2.5</td>
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<tr>
<td>Desert</td>
<td>1,925</td>
<td>2,159</td>
<td>234</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tundra</td>
<td>743</td>
<td>433</td>
<td>-310</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ice/Rock</td>
<td>1,640</td>
<td>1,640</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cropland</td>
<td>1,400</td>
<td>1,672</td>
<td>272</td>
<td>126</td>
<td>5,567</td>
<td>5,441</td>
<td>0.2</td>
<td>7.8</td>
<td>0.2</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>332</td>
<td>352</td>
<td>20</td>
<td>-</td>
<td>6,661</td>
<td>6,661</td>
<td>-</td>
<td>2.2</td>
<td>-</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>51,625</td>
<td>51,625</td>
<td>0</td>
<td>45.9</td>
<td>145.0</td>
<td>41.6</td>
<td>124.8</td>
<td>-4.3</td>
<td>-20.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Degradation of ecosystem services often causes significant harm to human well-being

- The total economic value associated with managing ecosystems more sustainably is often higher than the value associated with conversion.
- Conversion may still occur because private economic benefits are often greater for the converted system.
Economic Reasons for Conserving Wild Nature

**Costs** of expanding and maintaining the current global reserve network to one covering 15% of the terrestrial biosphere and 30% of the marine biosphere

$\text{Benefit} = \$US \ 45 \text{ Billion/yr}

**Benefits** (Net value* of ecosystem services from the global reserve network)

*Net value is the difference between the value of services in a “wild” state and the value in the most likely human-dominated alternative


$\text{Benefit} = \$US \ 4,400-5,200 \text{ Billion/yr}

**Benefit/Cost Ratio = 100:1**

<table>
<thead>
<tr>
<th>Aggregation method</th>
<th>Assumptions/approach</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic value transfer -</td>
<td>assumes values constant over ecosystem types</td>
<td>Costanza et al. 1997, Liu et al. 2010</td>
</tr>
<tr>
<td>2. Expert modified value transfer</td>
<td>adjusts values for local ecosystem conditions using expert opinion surveys</td>
<td>Batker et al. 2010,</td>
</tr>
</tbody>
</table>
Data for Hurricane Bill (2003)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill</td>
<td>2003</td>
<td>5,170,620</td>
<td>6,073,836,979</td>
<td>687,415</td>
<td>16 Million</td>
<td>25.72</td>
</tr>
</tbody>
</table>
The value of coastal wetlands for hurricane protection

\[ \ln \left( \frac{TD_i}{GDP_i} \right) = \alpha + \beta_1 \ln(g_i) + \beta_2 \ln(w_i) + u_i \]  \hspace{1cm} (1)

Where:

\( TD_i \) = total damages from storm \( i \) (in constant 2004 $US);

\( GDP_i \) = Gross Domestic Product in the swath of storm \( i \) (in constant 2004 $US). The swath was considered to be 100 km wide by 100 km inland.

\( g_i \) = maximum wind speed of storm \( i \) (in m/sec)

\( w_i \) = area of herbaceous wetlands in the storm swath (in ha).

\( u_i \) = error

Predicted total damages from storm \( i \)

\[ TD_i = e^\alpha \times g_i^{\beta_1} \times w_i^{\beta_2} \times GDP_i \]

Avoided cost from a change of 1 ha of coastal wetlands for storm \( i \)

\[ \Delta TD_i = e^\alpha \times g_i^{\beta_1} \times \left( (w_i - 1)^{\beta_2} - w_i^{\beta_2} \right) \times GDP_i \]
• A loss of 1 ha of wetland in the model corresponded to an average $33,000 (median = $5,000) increase in storm damage from specific storms.

• Taking into account the annual probability of hits by hurricanes of varying intensities, the annual value of coastal wetlands ranged from $250 to $51,000/ha/yr, with a mean of $8,240/ha/yr (median = $3,230/ha/yr).

• Coastal wetlands in the US were estimated to currently provide $23.2 Billion/yr in storm protection services.

EcoServices Classified According to Rivalness and Excludability

<table>
<thead>
<tr>
<th>Rival</th>
<th>Excludable</th>
<th>Non-Excludable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Goods and Services</td>
<td>Common Pool Resources</td>
</tr>
<tr>
<td></td>
<td>(some provisioning services)</td>
<td>(some provisioning services)</td>
</tr>
<tr>
<td>Congestable</td>
<td>Services</td>
<td>Public Goods and Services</td>
</tr>
<tr>
<td></td>
<td>(some recreation services)</td>
<td>(most regulatory and cultural services)</td>
</tr>
</tbody>
</table>
Integrated History and future Of People on Earth

Reconstruction of Ecosystem Services in the Lower Yangtze basin 1930-2000 from paleo records.

Source: John A. Dearing, Xiangdong Yang, Xuhui Dong, Enlou Zhang, Xu Chen, Peter G. Langdon, Ke Zhang, Weiguo Zhang and Terence P. Dawson. 2012. Extending the timescale and range of ecosystem services through paleoenvironmental analyses: the example of the lower Yangtze basin. *PNAS*
Intelligent Pluralism (Multiple Modeling Approaches), Testing, Cross-Calibration, and Integration

Multi-scale in time, space, and complexity

Can be used as a Consensus Building Tool in an Open, Participatory Process

Acknowledges Uncertainty and Limited Predictability

Acknowledges Values of Stakeholders

Evolutionary Approach Acknowledges History, Limited Optimization, and the Co-Evolution of Human Culture and Biology with the Rest of Nature
GUMBO (Global Unified Model of the BiOsphere)

MIMES
Multi-scale Integrated Models of Ecosystem Services

Biosphere
- Earth Surfaces
  - Nutrient Cycling
  - Biodiversity

Hydrosphere
- Water by Reservoir

Lithosphere
- Geological Carbon
- Ores

Atmosphere
- Earth Energy
- Gasses

Anthroposphere
- Cultures
  - Social Capital
  - Human Capital
  - Built Capital

Location
- Ecosystem Services

Exchanges Between Locations
Growing the ancient Maya social-ecological system from the bottom up

Scott Heckbert, Christian Isendahl, Joel Gunn, Simon Brewer, Vernon Scarborough, Arlen F. Chase, Diane Z. Chase, Robert Costanza, Nicholas Dunning, Timothy Beach, Sheryl Luzzadder-Beach, David Lentz and Paul Sinclair

Figure 4: Spatial model results for the scenario where trade is enabled. Population density, forest condition, and settlement trade strength is shown at time step 200, 400, and 600. Darker colouring shows increased population density (blue) and trade strength (red), and forest condition depicts three states of cleared / cropped cells (yellow), secondary regrowth (light green), and climax forest (dark green).

Figure 6: Real income of all simulated settlements over time by contributions from agriculture, ecosystem services, and trade value. Ecosystem services is eventually superceded by agriculture, and both by trade around time step 350.
Fair distribution is essential to quality of life.

Health and Social Problems are Worse in More Unequal Countries

Index of:
- Life expectancy
- Math & Literacy
- Infant mortality
- Homicides
- Imprisonment
- Teenage births
- Trust
- Obesity
- Mental illness — incl. drug & alcohol addiction
- Social mobility

OUT OF BALANCE

A Harvard business prof and a behavioral economist recently asked more than 5,000 Americans how they thought wealth is distributed in the United States. Most thought that it’s more balanced than it actually is. Asked to choose their ideal distribution of wealth, 92% picked one that was even more equitable.
Life Satisfaction and Per Capita GDP around the World

Source: Deaton, 2008.
Genuine Progress Indicator (or ISEW) by Column

Additions

Column A: Personal Consumption Expenditures
Column B: Income Distribution
Column C: Personal Consumption Adjusted for Income Inequality
Column D: Value of Household Labor
Column E: Value of Volunteer Work
Column F: Services of Household Capital
Column G: Services Highways and Street
Column H: Cost of Crime
Column I: Cost of Family Breakdown
Column J: Loss of Leisure Time
Column K: Cost of Underemployment
Column L: Cost of Consumer Durables
Column M: Cost of Commuting
Column N: Cost of Household Pollution Abatement
Column O: Cost of Automobile Accidents
Column P: Cost of Water Pollution
Column Q: Cost of Air Pollution
Column R: Cost of Noise Pollution
Column S: Loss of Wetlands
Column T: Loss of Farmland
Column U: Depletion of Nonrenewable Resources
Column V: Long-Term Environmental Damage
Column W: Cost of Ozone Depletion
Column X: Loss of Forest Cover
Column Y: Net Capital Investment
Column Z: Net Foreign Lending and Borrowing

Subtractions

Columns: Built Capital, Human Capital, Social Capital, Natural Capital
www.green.maryland.gov/mdgpi/
Maryland GPI Grows More Than 2 Percent Last Year

by kking

GPI updated with 2011 data

Governor Martin O’Malley today announced that the State has updated Maryland’s Genuine Progress Indicator (GPI), the first state government sanctioned tool of its kind, to include 2011 data. According to the new data, Maryland’s GPI – a measure of statewide well-being – grew more than 2 percent since last year; the highest increase since 2005.

“The GPI is one of the best ways to evaluate our progress as a State because it provides a comprehensive look at our economy, natural resources and community,” said Governor O’Malley. “With these results we are able to see where we need to focus our efforts, and create the necessary policies.”
GPI/capita for the 17 countries for which it has been estimated.
Global GPI/capita & GDP/capita

The Sustainable and Desirable “doughnut” (after: K. Raworth. 2012. A safe and just space for humanity: can we live within the doughnut? Oxfam International)
A. Sustainable scale: respecting ecological limits

B. Fair distribution: protecting capabilities for flourishing

C. Efficient allocation: building a sustainable macro-economy
Example Policy Reforms

- Reversing Consumerism
- Expanding the Commons
- Systematic Caps on Natural Resources
- Sharing Work Time
A no-growth disaster

A better low/no-growth positive economy

12 things we need to change to create a better world

1. New meanings and measures of success
12 things we need to change to create a better world

2. Limits on materials, energy, wastes, and land use
12 things we need to change to create a better world

3. More meaningful prices
12 things we need to change to create a better world

4. More durable, repairable products
12 things we need to change to create a better world

5. Fewer status goods
12 things we need to change to create a better world

6. More informative advertising
12 things we need to change to create a better world

7. Better screening of technology
112 things we need to change
to create a better world

8. More efficient capital stock
12 things we need to change to create a better world

9. More local, less global
12 things we need to change to create a better world

10 Reduced inequality
12 things we need to change to create a better world

11 Less work, more leisure
12 things we need to change to create a better world.

12 Education for life, not just work.
CLIMATE SUMMIT

WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.
To create a sustainable and desirable economy-in-society-in-nature requires:

• Breaking our *addiction* to the "growth at all costs" economic paradigm, to fossil fuels, and to over-consumption

• Envisioning a more sustainable and desirable future that focuses on quality of life
Rio+20: The World We Want

Solutions
For a sustainable and desirable future

Rio+20: The World We Want

Bringing Mozart to the Masses: Venezuela’s Music Revolution
by María Páez Víctor

Fight the Status Quo
by Bill McKibben

Sustainable Consumerism in China
by Peggy Liu

After Financial Collapse, A New Green Economy
by Yan Junes

The UK Asks, How Happy Are Its Citizens?
by Christina Asquith

Why Everyone Should Be a Futurist
by William S. Becker

Visions of a Sustainable Future

Why Everyone Should Be a Futurist
by Bill Bao
For Rio+20: A Charter for a New Economy
by James Galbraith, Spiri
Think Like an Ecosystem, See Solutions
by T. Christian Miller
The Way Forward: Survival 2100
by William Liu

The Big Picture

The Next Transition: The Evolution of Humanity’s Role in the Universe
by Max Tegmark, Tucker and Dan Thomas Steinman
It’s Time to Fight the Status Quo
by Bill McKibben
Can We Avoid the Perfect Storm?
by Gaye Tolman
How to Apply Resilience Thinking—In Australia and Beyond
by Brian Walker
Endangered Elements: Conserving the Building Blocks of Life
by Peter Senier

Setting New Goals
Sustainability and Happiness: A Development Philosophy for Bhutan and the World
by King Jigme Thinley, Prime Minister, Royal Government of Bhutan
Flourishing as a Goal of International Policy
by Martin Srinivasan
Green Accounting: Balancing Environmental and Economy
by Peter Boush
Working Less for a Sustainable Future
by Robert Hackett
Millennium Consumption Goals Seek to Protect the Poor and the Planet
by Diana Mascarenhas
Happiness and Psychological Well-being: Building Human Capital to Benefit Individuals and Society
by George Vaillant

Building a New Paradigm
After Financial Collapse, A New Green Economy
by Yan Junes
A World That Works for All
by Peter Drucker
Fighting Poverty by Healing the Environment
by Christine Figueres
Three Steps to a Sustainable Economy
by Oxford Economics
Raising Gross National Happiness through Agroecology
by Patricia Sumarto, Indonesia and Oria Thompson
Building Bridges between Scientists and Policymakers to Reach Sustainability
by Katherine Richter and Uwe Albrecht

Focusing on the Next Generation
Bringing Mozart to the Masses: Venezuela’s Music Revolution
by Maria Páez Víctor
Creating the Schools of the Future: Education for a Sustainable Society
by Peter M. Senge
Values and the Next Generation
by The Kapor
Teaching a University Course in Sustainable Happiness
by Sarah Omaya
Sustainable Consumerism Begins with China
by Peggy Liu

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by Jacqueline McClane

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by Christina Asquith

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Rio+20: Charting the Way to a Green Economy
by Elizabeth Long

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Thank you

cultural creatives share a series of attitudes and concerns: "they like to get a synoptic view [and] see all the parts spread out side by side and trace the interconnections"; they have strong concerns about the well-being of families; they have a well-developed social consciousness and a "guarded optimism for the future"; they are disenchanted with "owning more stuff... materialism... status display and the glaring social inequities of race" and are critical of almost every big institution of modern society, including corporations and government. This cultural group is drawn from all classes, races, education and income levels and social backgrounds and has emerged only during the past 50 years.