

How is the planet doing? 2012

Global Status of Provisioning, Regulating, and Cultural Ecosystem Services Evaluated in the Millennium Ecosystem Assessment

First of a Four Part Series for Rio 2012

Trends in Provisioning Services

- Food**
 - ↑ Crops: substantial production increase
 - ↑ Livestock: substantial production increase
 - ↓ Capture Fisheries: declining production due to overfishing
 - ↑ Aquaculture: substantial production increase
 - ↓ Wild Foods: declining production
- Fiber**
 - +/- Timber: forest loss in some regions, growth in others
 - +/- Cotton, Hemp, Silk: declining production of some fibers, growth in others
 - ↓ Wood Fuel: declining production
- Genetic resources**
 - ↓ lost through extinction and crop genetic resource loss
 - Biochemicals, natural medicines, pharmaceuticals
 - ↓ lost through extinction, overharvest
- Fresh water**
 - ↓ unsustainable use for drinking, industry, and irrigation; amount of hydro energy unchanged, but dams increase ability to use that energy

Trends in Cultural Services

- ↓ Spiritual and religious values: rapid decline in sacred groves and species
- ↓ Aesthetic values: decline in quantity and quality of natural lands
- +/- Recreation and ecotourism: more areas accessible but many degraded

Trends in Regulating Services

- Air quality regulation**
 - ↓ decline in ability of atmosphere to cleanse itself
- Climate regulation**
 - ↑ Global: net source of carbon sequestration since mid-century
 - ↓ Regional and local: preponderance of negative impacts
 - +/- Water regulation: varies depending on ecosystem change and location
 - ↓ Erosion regulation: increased soil degradation
 - ↓ Water purification and waste treatment: declining water quality
 - +/- Disease regulation: varies depending on ecosystem change
 - ↓ Pest regulation: natural control degraded through pesticide use
 - ↓ Pollination (low to medium certainty on this trend): apparent global decline in abundance of pollinators
 - ↓ Natural hazard regulation: loss of natural buffers (wetlands, mangroves)

Key to judgements about trends

- ↑ Favorable. More of services and generally better services
- ↓ Declining. Less of services or decreasing quality of services
- +/- Mixed picture. Better some places, worse in others

Three dangerous boundaries crossed and four more rapidly approaching

- Boundary exceeded
- Approaching limit
- Boundary not exceeded
- To be determined

Second of a Four Part Series for Rio 2012

What Dangerous Thresholds of Planetary Boundaries Have We Crossed?

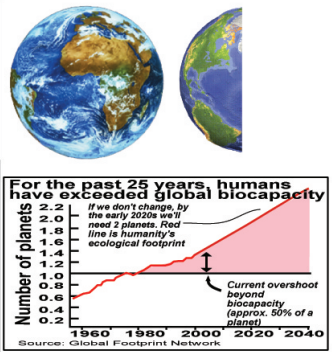
- Earth System Process**
 - Climate change (amount of CO₂ in atmosphere and change in radiative forcing)
 - Rate of biodiversity loss (number of species per million lost per year)
 - Nitrogen cycle (part of a boundary with the phosphorus cycle)
 - Phosphorus cycle (part of a boundary with the nitrogen cycle)
 - Ocean acidification
 - Global freshwater use
 - Change in land-use
 - Stratospheric ozone depletion
 - Atmospheric aerosol loading
 - Chemical pollution

Source: Rockström, J. et al., *A Safe Operating Space for Humanity*, Nature 451: 412-415, 24 September 2008

We'll need two planets by the early 2020s

Third of a Four Part Series for Rio 2012

Global Footprint Network calculates we are using more than 1-1/2 planets of biocapacity



How is civilization doing?

Fourth of a Four Part Series for Rio 2012

ENERGY AND POWER	MOBILITY	MATERIALS	FOREST
<ul style="list-style-type: none"> Energy R&D funded International agreements on climate & energy Carbon price: Cap & trade or carbon tax CCS - Carbon capture and sequestration for power plants Energy subsidies phased out Renewables funded for rapid implementation 	<ul style="list-style-type: none"> Miles per gallon up to 30-40% plus electric & hybrid electric Integrated urban planning, especially in the fast-growing cities Transportation energy efficiency standards harmonized globally (no incentives for new technology) International standards for sustainable biofuels adopted & installed Policy makers and industry partner speed up research & deployment of alternative drivetrains & advanced biofuels Technology rail networks spread 	<ul style="list-style-type: none"> Global business - governments agree on indicators & rules for accounting about resources, energy and materials New landfill legislation sets standards for recycling & reuse CCS - Carbon Capture & Storage for extraction & manufacturing industry Externalties internalized Global price on carbon: Internalize major cost of CO₂ & other emissions Technology transfer for energy & food is successfully implemented 	<ul style="list-style-type: none"> Reducing Emissions from Deforestation & forest Degradation (REDD) report released Commitments to deep carbon reductions by industrialized countries to create demand for REDD - carbon credits Major actions addressed by REDD+ begin to be implemented Shift production from modified natural forest to planted forest. State planted forest plants by 2020 Increase carbon stored in world forests
AGRICULTURE	BUILDINGS	GOVERNANCE	PEOPLE
<ul style="list-style-type: none"> Food, feed, fibre, & fuel increase two-fold Asian, Pacific water efficiency doubles Freer trade in agricultural products Wheat production doubles 	<ul style="list-style-type: none"> Sustainable biofuels for aviation are fully tested and begin to be used Vehicle users adopt more efficient driving behavior Improved energy efficiency in shopping achieved with holistic approaches to transport chain Building energy efficiency improves significantly 	<ul style="list-style-type: none"> Major collection of international agreements on climate and energy More effective G-20 summit of the Major Economies meets quarterly Education of women & improved health of children Reproductive choice, family planning, available safe abortion everywhere 	<ul style="list-style-type: none"> Improved natural literacy to increase knowledge and attention to ecosystem services Increase investment in rural communities in and around protected areas for biodiversity protection Business, NGOs, governments agree on ecosystem valuation including global common Seed banks and botanical gardens preserve most of today's biodiversity Fair pricing of ecosystem services

The dashboard of the World Business Council for Sustainable Development's 40 Must-Haves shows we are seriously behind where we should be for 2050