

Global Sustainability Science

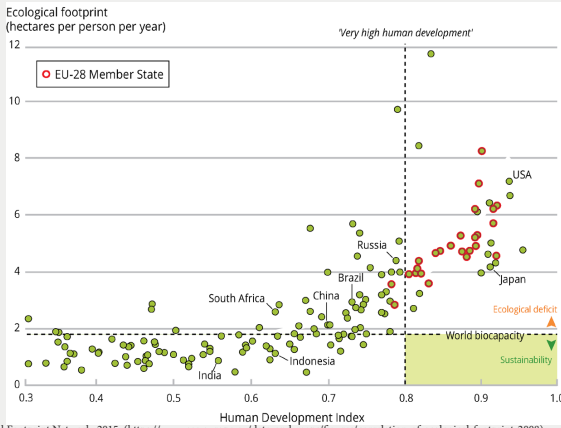
Overcoming presentism



Presentism explained

Presentism is discrimination against future generations by not taking into account their interests. This means that due to short-sightedness people fail to look at the future and take the interests of their own children and grandchildren into account. Especially in the face of the current climate crisis, this is problematic at best and lethal at worst. Therefore, the interests of future generations should be considered with every decision.

The myth of sustainable development



Up until now, every country in the world's ecological footprint is simply too large, which in turn is contributing to the depletion of the world's biocapacity: World Overshoot Day 2020 was on 22 August! The graph shows that none of the developed countries are sustainable. There are no countries which are both developed according to the Human Development Index and sustainable as measured by their ecological footprint. Hence, sustainable development is a myth.

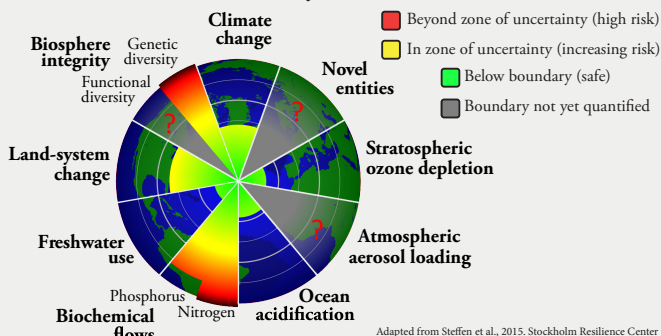
Sustainable Development Goals



Visseren-Hamakers, 2020. Earth System Governance

The world is connected; everything depends on everything else. When trying to reach one goal, people also have to take other goals into consideration. Social, natural, governance, and economic aspects are all indispensable. Unfortunately, there is one thing that this framework fails to take into account, namely the interests of non-human animals (which have been added as the 18th SDG (Visseren-Hamakers (2020))).

Planetary boundaries

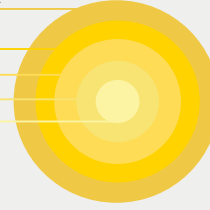


Since the Industrial Revolution humanity has impacted the natural systems in an incredibly destructive manner. Biodiversity, nutrient input, land-use change and climate change have already gone beyond the 'safe zone' boundary, indicating an increased risk of unavoidable, destructive and irreversible changes.

The expanding moral circle

Nature, ecosystems, the planet

Sentient beings
Future generations
Other people
Me



Is sustainability good for me? And what effect do my actions have on other people? Do I want a habitable planet for my children? Are my actions harming other sentient beings, closeby or far away? To avoid a climate catastrophe, we have to expand our moral circle.

Attitudes to nature

Despot

Short-term (egoistic) self-interest. Denying environmental problems.

Enlightened despot

Believing that technology will fix all problems.

Steward

Religious: taking care of the earth for God.
Secular: taking care of our planet for future generations.

Partner

Being an equal partner with nature, conserving nature.

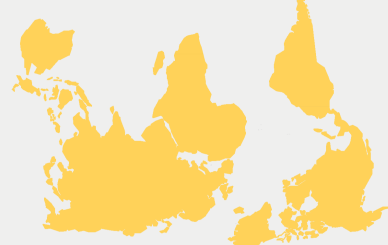
Participant

Having the lowest possible harmful impact on the planet.
Treading softly on the earth: preserving nature.

Unio mystica

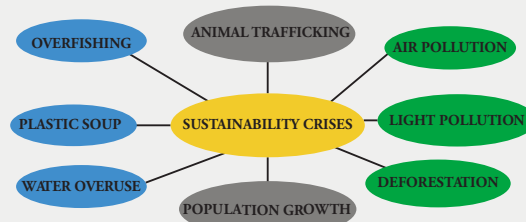
Being in a state of selfless harmony with nature.

Global North vs. Global South



The root of our problems lies in the Global North, whereas the expressions of these problems are most visible in the Global South. This is aggravated by the location and research of most knowledge institutes, which are in -and mostly focused on- the Global North. However, inclusion of the Global South is indispensable in solving the world's problems in the future.

The tragedies of the commons



There are many more crises than the climate crisis. Unsurprisingly, some of these crises are linked. Common goods, such as the air, the oceans, and the rainforests, are used by everyone but not managed appropriately. In other words, it is economically beneficial to use as much of each resource as possible, without taking into account that this will have a negative impact on the availability of the resource (and thus one's own benefit) in the longer term. This term was coined by Garrett Hardin in *The Tragedy of the Commons* (1968).

Classics of GSS

A historical overview

Walden
Henry David Thoreau, 1854

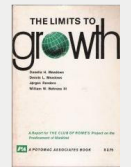
A Sand County Almanac
Aldo Leopold, 1949



Silent Spring
Rachel Carson, 1962

The Historical Roots of our Ecological Crisis
Lynn White, 1967

The Population Bomb
Paul Ehrlich, 1968



The Limits to Growth
Club of Rome, 1972

Small is Beautiful
E.F. Schumacher, 1973

The Shallow and the Deep
Arne Næss, 1973



The Tragedy of the Commons
Garrett Hardin, 1974

Man's Responsibility for Nature
John Passmore, 1974

Should Trees have Moral Standing?
Christopher Stone, 1974

Ecotopia
Ernest Callenbach, 1975

Gaia: A New Look at Life on Earth
James Lovelock, 1974

Respect for Nature
Paul Taylor, 1986



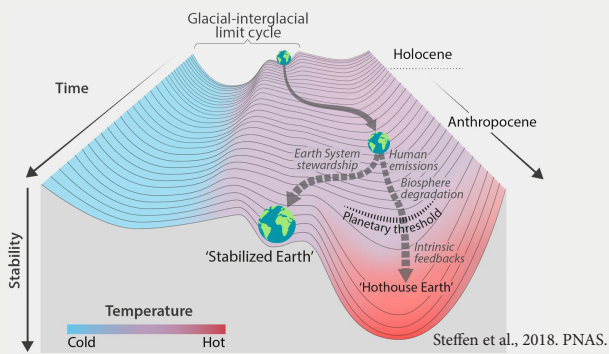
Our Common Future
Brundtland Commission, 1987



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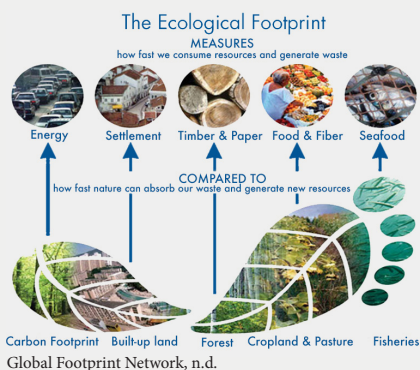
Overcoming presentism

Tipping points ahead



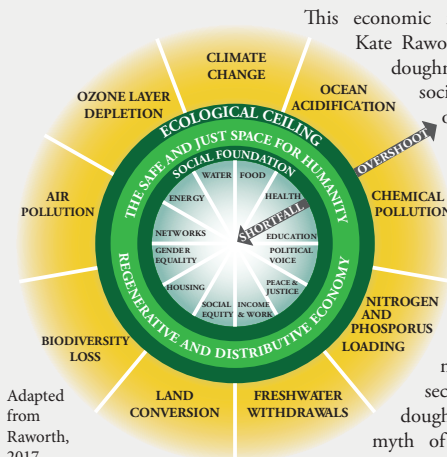
The more anthropogenic greenhouse gas emissions (GHG emissions) are spewed into the atmosphere, the more damage is done to other natural systems, and thus the more likely it is that the Earth System will pass a critical threshold. Consequently, 'hothouse Earth' is unavoidable, leading to severe and irreversible damages to society and ecosystems. To mitigate this, GHG emissions need to be reduced as quickly as possible. Everyone has a moral obligation to be part of the solution, and not to be part of the problem.

The ecological footprint



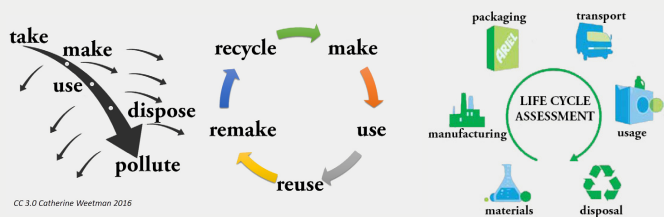
Calculating someone's or something's ecological footprint is not easy; it comprises more than just greenhouse gas emissions. For example, land use, waste generation and water use are all part of it. Simply put, consuming less and more environmentally friendly is always better. Being conscious about your behaviour and then acting on it, will help a lot. For example, shift to a plant-based diet.

The Doughnut Economy



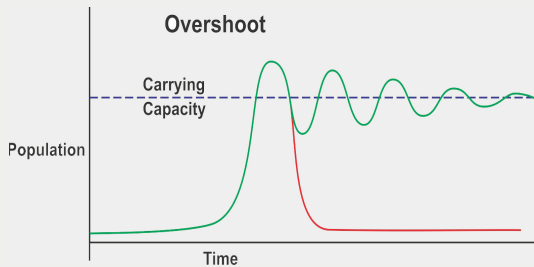
This economic model was developed by Kate Raworth. The inner ring of the doughnut represents the minimum social needs, whereas the outer ring represents the planetary boundaries. Once we stay in between both boundaries, our economy will be able to thrive without the requirement of eternal growth. It supports the idea of a circular economy, in which resources are not being depleted (see section Linear vs. circular). A doughnut economy will end the myth of sustainable development.

Linear vs. circular



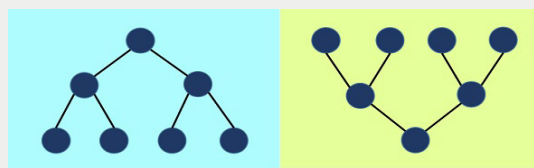
The true sustainability of a product is complex. Sourcing of the materials, production, usage and ultimately disposal: all stages need to be taken into account. Life cycle assessment is a popular and comprehensive tool to assess the sustainability of a production process.

Equilibrium or collapse?



When something is growing exponentially, it will either stabilize when crossing the carrying capacity of the system or plummet and crash the system. Currently, most systems are still growing and it does not seem that they will stop any time soon. This is very worrying: Are we about to crash planet Earth? Sneak preview: the science is unequivocal, and we are definitely going in the wrong direction.

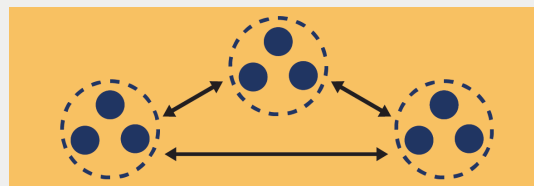
Modes of governance



Top-down Approach Vs Bottom-up Approach

Political action originates from a governmental body and its consequences trickle down. This is very effective for short-term measures. Public support is not strictly necessary.

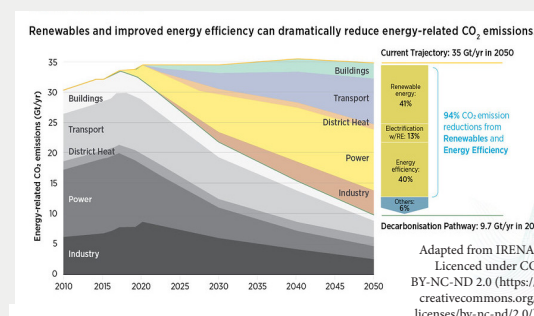
The public demand political action fed by a deep societal frustration, hence governmental bodies are forced to respond. Long-lasting transformative change is created but is slow.



Interactive Governance Approach

An increasingly popular approach which combines aspects from the top-down and bottom-up approaches. Stakeholder groups such as citizens, private businesses, and government interact to create new ways of governing the increasingly complex societal dynamics. The system is focused on the applicability of agreements and occurs on multiple societal scales and with overlapping, cross-cutting power structures and responsibilities. As such, this approach stimulates engagement of all stakeholders at all levels of society, and this strengthens democratic governance (Kooiman et al., 2008).

The energy transition



Energy is comprised of much more than just electricity. Heating and cooling, industrial processes and transport all require massive amounts of energy, most often still in the form of fossil fuels. Fortunately, renewable energy like solar and wind power has massive potential to transform the energy sector. Centralised systems will be replaced by decentralised grids.

Classics of GSS

A historical overview



Governing the Commons
Eleanor Ostrom, 1990

Steady-state economics
Daly Herman, 1992

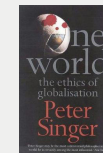
Agenda 21
United Nations, 1992



Participating with Nature
Wim Zweers, 1992

Ecological Feminism
Karen Warren, 1994

Earth Chapter
Brundtland Commission, 2000



One World
Peter Singer, 2002

Earth democracy: Justice, sustainability and Peace
Vindana Shiva, 2005

A Safe Operating Space for Humanity
Rockström et al., 2009

Eradicating Ecocide
Polly Higgins, 2010



Doughnut Economics
Kate Raworth, 2012

Requiem for a Species
Clive Hamilton, 2015

Half-Earth: Our Planet's Fight for Life
E.O. Wilson, 2016



Global Warming of 1.5°C
IPCC, 2018

No One is Too Small to Make a Difference
Greta Thunberg, 2019

