

Theories and Practices of Sustainable Development (TPSD)

3rd lecture

11-April-2026

Summary:

3. Dimensions/pillars of sustainable development – 2 versions:

1. The official (Brundtland) version of the three pillars of sustainable development (SD): the economic, social and environmental pillars.

- Trade offs and synergies between dimensions. Social inequality and environmental degradation (synergy). The distributive impact of environmental and SD policies (trade off). The choice of discount rate as a distributive issue.
- The Porter thesis of a new relationship between the environment and competitiveness.

2. A hierarchy among the three dimensions of an economy (Daly): a (*sustainable*) scale, a (*just*) distribution and an (*efficient*) resource allocation.

Growth ***has no set limits*** in terms of population or resource use beyond which lies ecological disaster. Different limits hold for the use of energy, materials, water, and land. Many of these will manifest themselves in the form of rising costs and diminishing returns (***e.g.: growth will be halted by rising food prices and wages – RICARDO SEC XIX***), rather than in the form of any sudden loss of a resource base (***contrary to the OVERSHOOT AND COLAPSE thesis***).

The accumulation of knowledge and the development of technology can enhance the carrying capacity of the resource base.

But ultimate limits there are, and sustainability requires that long before these are reached, the world must ensure equitable access to the constrained resource and reorient technological efforts to relieve the pressure.

(Brundtland report).

That is (as regards the **economic** and **environmental** dimensions):

- There are not set limits to growth
- The substitution between resources shifts those limits beyond what was previously believed
- (market) prices provide the right signals that enable gradual adaptive adjustments in resource use and point the direction for relevant innovations;
- ... and, in particular, technological innovation pushes the limits beyond previous beliefs
- but ultimate limits there are (we just don't know where they lie)

(We don't believe on witches, but that they exist is a fact!)

There is a mix of optimism and realism about the human capacity of pushing limits to growth and the performance of existing institutions (in particular the **MARKET**) to govern sustainability issues.

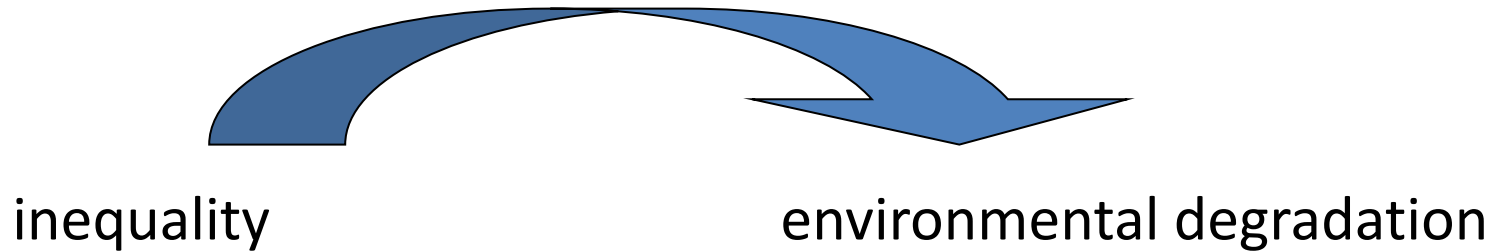
Many problems of resource depletion and environmental stress arise from *disparities in economic and political power*.

An industry may get away with unacceptable levels of air and water pollution because the people who bear the brunt of it are poor and unable to complain effectively.

A forest may be destroyed by excessive felling because the people living there have no alternatives or because timber contractors generally have more influence than forest dwellers.

That is (as regards **social** and **environmental** dimensions):

Economic and political inequality (not poverty or the poor) are a major driver of environmental degradation



As a system approaches ecological limits, **inequalities sharpen**.

Thus when a watershed deteriorates, poor farmers suffer more because they cannot afford the same anti-erosion measures as richer farmers.

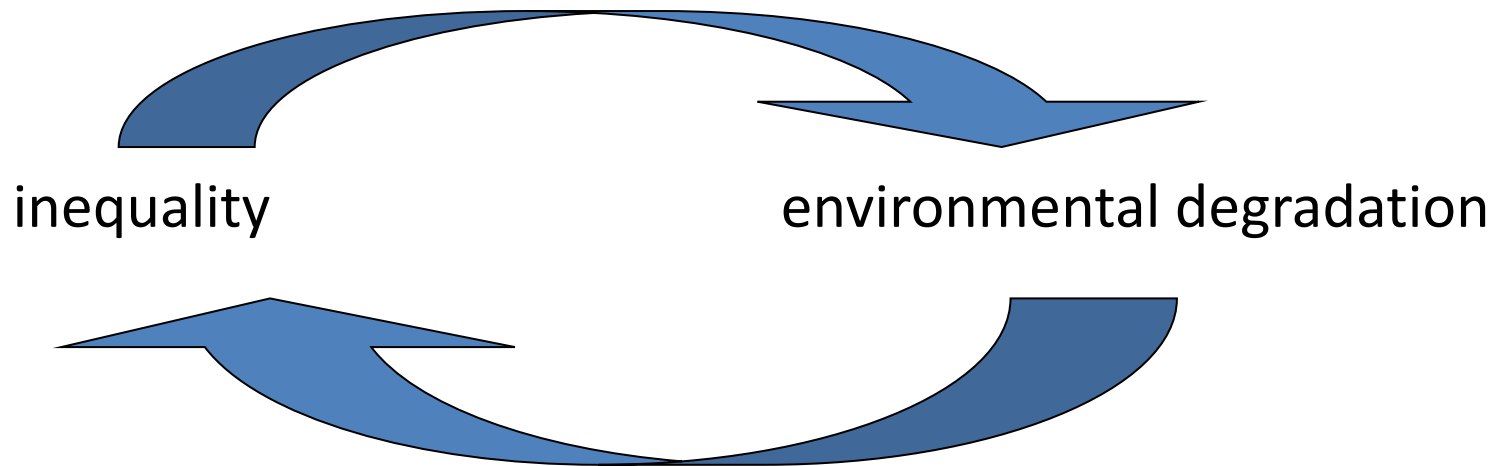
When urban air quality deteriorates, the poor, in their more vulnerable areas, suffer more health damage than the rich, who usually live in more pristine neighbourhoods.

When mineral resources become depleted, late-comers to the industrialization process lose the benefits of low-cost supplies.

Globally, wealthier nations are better placed financially and technologically to cope with the effects of possible climatic change.

That is (as regards **social** and **environmental** dimensions):

The poor are the ones paying the costs of the (ecological) crisis
– environmental degradation amplifies inequality levels



Meeting essential needs depends in part on achieving full growth potential, and **sustainable development clearly requires economic growth** in places where such needs are not being met.

Elsewhere, it can be consistent with economic growth, provided ... [it is sustainable].

The number of years required to bring the poverty ratio down from 50 to 10 per cent ranges from:

- 18-24 years if per capita income grows at 3 per cent,
- 26-36 years if it grown at 2 per cent, and
- 51-70 years if it grows only at 1 per cent.

(the shorter time is associated with the redistribution of 25 per cent of the incremental income of the richest fifth of the population and the longer period with no redistribution.)

That is (as regards the **economic** and **social** dimensions):

(fast) economic growth is required...

... at least where the most basic needs are yet unmet.

Daly's view

- Timbergen's principle for public policy: "... for every independent policy goal (**target**) we must have an independent policy **instrument**."
- 3 separate goals for an economy:
 - An efficient **allocation** of resources among alternative product uses (resources are allocated among uses according to individual preferences as weighted by their WTP)
 - A fair **distribution** of the final goods and services among alternative people (just or fair means the degree of allowed inequality is limited within an acceptable range)
 - A sustainable **scale**, that is a level of throughput of matter-energy from and back to the environment that doesn't erode the environmental carrying capacity over time
(the throughput can be thought of in physical units as population x per capita resource use).

Daly's view

- 3 separate policy tools:
 - relative prices determined by supply and demand in competitive markets (**MARKETS**);
 - taxes and social benefits (**FISCAL and BUDGETARY POLICIES**);
 - tradeable permits for emissions, resource use and births (**DIRECT CONTROLS OF THE OVERALL ENVIRONMENTAL BURDEN**).
- Economists have tried to include a sustainable scale under
 - Allocation, that is: an efficient inter-temporal allocation of stock-type resources, or:
 - distribution, that is a fair distribution of welfare among generations.
- ... so avoiding the need for a third, separate tool for sustainability.

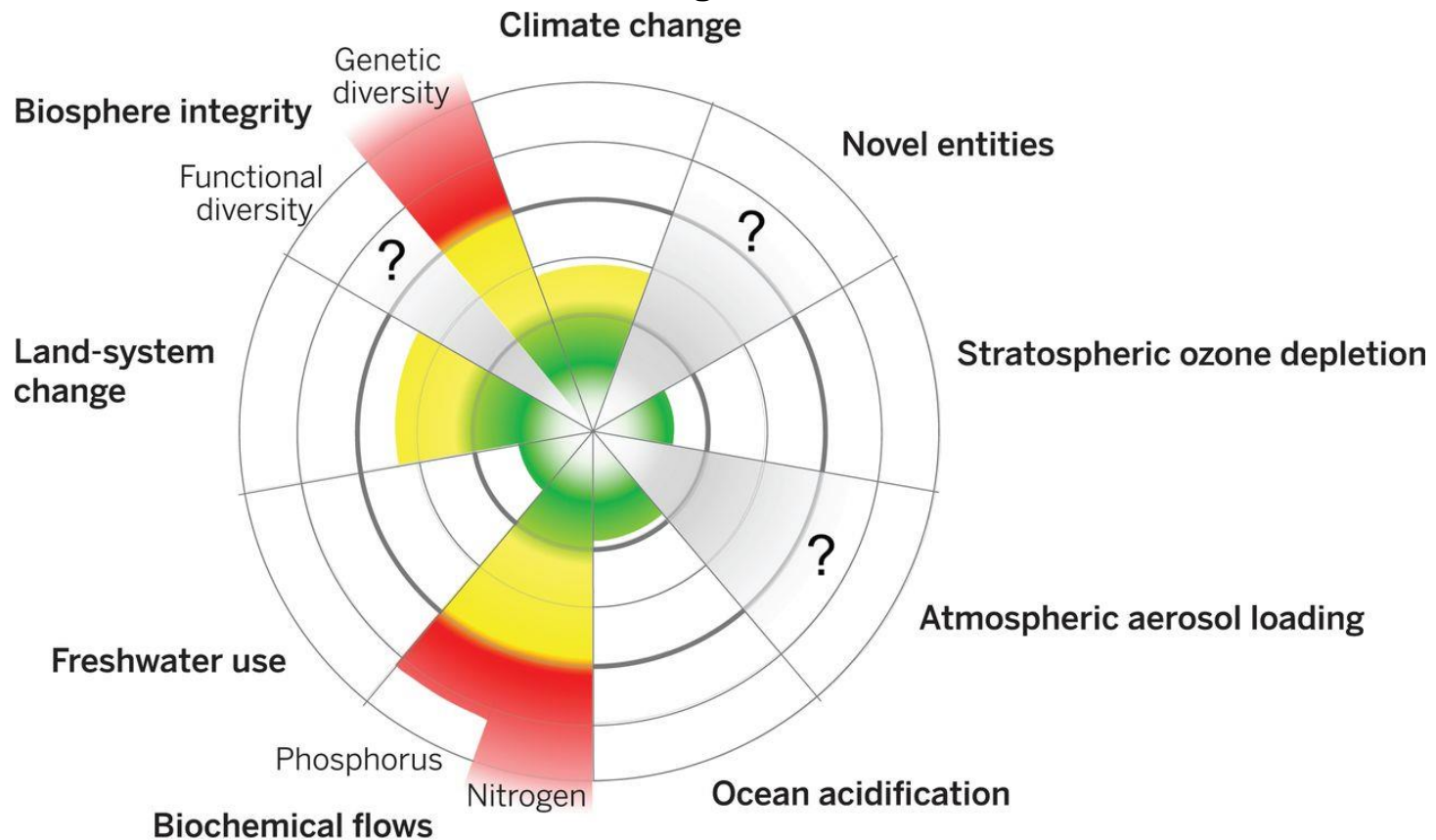
Hierarchy of the three dimensions:

A sustainable scale comes first

A scale that respects Earth's "rules of the game" or is within the "planetary playing field" for the human enterprise

(Planetary Boundaries, 2009/15).

Current status of the control variables for seven of the planetary boundaries. The green zone is the safe operating space, the yellow represents the zone of uncertainty (increasing risk), and the red is a high-risk zone.



Will Steffen et al. *Science* 2015;347:1259855



Daly's view

Dales proposes tradeable pollution permits as a clear example of the independence and proper (sequential) relationship between scale, distribution and allocations:

- First a limit to total pollution (e.g. CO2 eq emissions) must be set; this total must be sustainable, that is within the assimilative capacity of the environment. Then a limited number of rights to pollute is issued.
- Second, this limited number of rights must be initially distributed, in a fair way, to people, firms, ..., for free or through an auction (if they are considered a collective right).
- Only then, after these collective decisions have been made regarding an ecologically sustainable scale and ethically just distribution, can we go on to allow markets to play their goal of getting efficiency through the reallocation of rights among individuals and goals.

*(underline this incomplete nature of cap-and-trade markets: **scale is not determined by prices**).*

Daly's view

A (forced) transition towards a steady-state sustainable economy

1. An institution for stabilizing population (e.g. tradeable birth permits);
2. An institution to stabilize the stock of physical wealth and throughput (e.g. cap and trade resource-use or emission markets);
3. An institution to ensure that stocks and flows are distributed fairly among the population (e.g. property and income tax coupled with budget policy, minimum income policies,...);
4. Competitive markets to get efficient allocations (e.g. competition policies).

Is there a fourth pillar?

- Culture?
- Governance?

Culture **frames, enables and drives** development, either sustainable or not; as related to “actor motivation”, culture is a candidate to substitute for the economic pillar...

Governance is more about how to arrange actors to **implement** sustainable development; we can opt for top-down, bottom-up or decentralized-planning large-scale (e.g. market) arrangements