



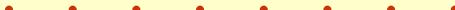
Ecological vs Environmental Economics



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Ecological Economics (EE)

- **Institutionalised:** ISEE, regional societies.
 - **Publications:** Journal, books.
 - **Criticism on mainstream (environmental and resource) economics (ERE).**
 - **Multidisciplinary forum.**
 - **Methodological pluralism.**
 - **Intellectual antecedents:** Boulding, Daly, Georgescu-Roegen, Holling, Odum.
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EE vs. ERE

Ecological Economics	Traditional Environmental and Resource Economics
1. Optimal scale	1. Optimal allocation and externalities
2. Priority to sustainability	2. Priority to efficiency
3. Needs fulfilled and equitable distribution	3. Optimal welfare or Pareto efficiency
4. Sustainable development, globally and North/South	4. Sustainable growth in abstract models
5. Growth pessimism and difficult choices	5. Growth optimism and “win-win” options
6. Unpredictable co-evolution	6. Deterministic optimisation of intertemporal welfare
7. Long-term focus	7. Short to medium term focus
8. Complete, integrative and descriptive	8. Partial, monodisciplinary and analytical
9. Concrete and specific	9. Abstract and general
10. Physical and biological indicators	10. Monetary indicators
11. Systems analysis	11. External costs and economic valuation
12. Multidimensional evaluation	12. Cost-benefit analysis
13. Integrated models with cause-effect relationships	13. Applied general equilibrium models with external costs
14. Bounded individual rationality and uncertainty	14. Maximisation of utility or profit
15. Local communities	15. Global market and isolated individuals
16. Environmental ethics	16. Utilitarianism and functionalism

Ecological economics in more detail

- 1 **Sustainable development.**
- 2 **Growth debate.**
- 3 **International trade.**
- 4 **Economy-environment interactions.**
- 5 **Multilevel dynamics.**
- 6 **Behaviour and policy.**

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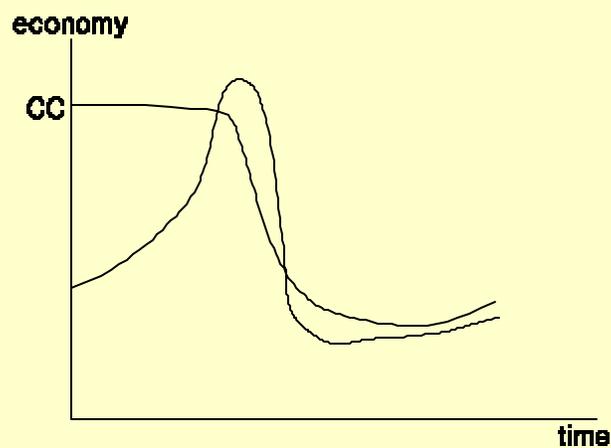
1. Sustainable development

- **Strong vs. weak sustainability:** complements vs. substitutes.
- **Ecosystem level vs. aggregate, macroeconomic level:** resilience vs. deterministic aggregate trends.
- **Optimal physical scale of economy and population:** steady state (Daly).
- **Sustainable growth?**

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Variabele draagkracht (CC)



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2. Growth debate continues

- **Is growth desirable?**
- **Is growth feasible?**
- **Can growth be controlled or steered?**

- **Perspectives:** immaterialist, pessimist, technocrat, opportunist, optimist.
- **Focus:** question, time horizon.

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Indicator: GDP and GDP growth

- **GDP no welfare indicator:** costs, no benefits.
- **GDP and developing countries:** large informal economy.
- **GDP growth:** shift from informal to formal economy.
- **Goal of 3-4% growth:** no theoretical support.
- **Environment, resources, nature and human health:** costs of damage, compensation of damage avoidance shown as GDP additions.
- *Discussion about GDP growth useless?*

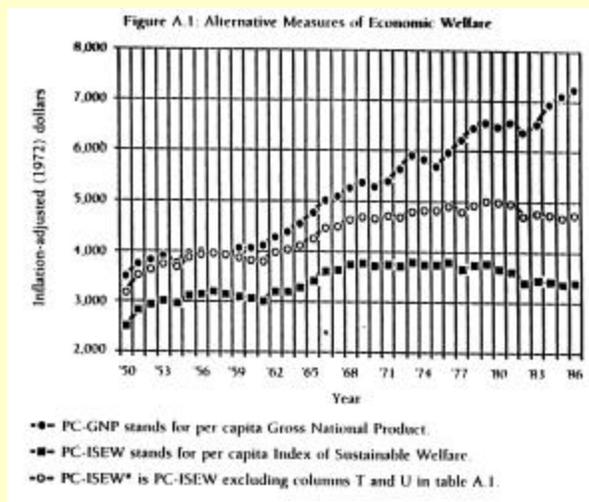
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ISEW, GPI and Hueting sust. inc.

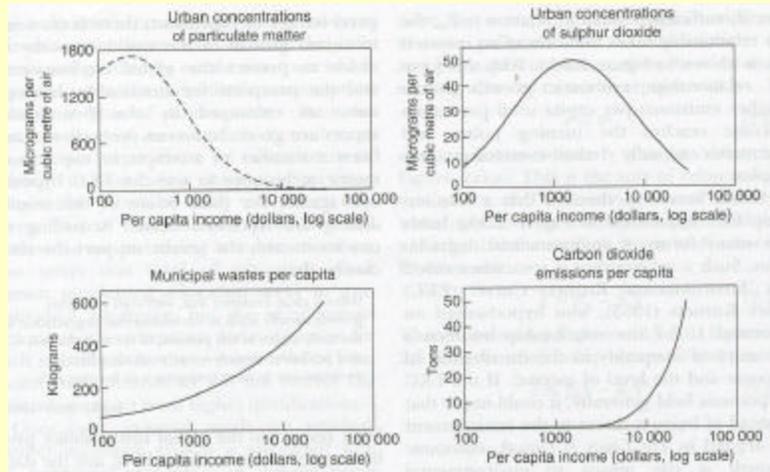
Corrections:

- **Pollution & degradation.**
- **Depletion natural resources.**
- **Defensive expenditures.**
- **Restoration expenditures (incl. health care).**
- **Income distribution.**
- **Informal sector (house and voluntary work).**
- **Costs of criminality and divorce.**

GDP vs. ISEW for The US, 1950-1987



Environmental Kuznets curve?



EKC tests

- **Empirical findings mixed.**
- **Temporal and spatial discounting:** e.g., no EKC for household waste & CO₂ emissions.
- **Feedback pollution-health strong:** de-linking found (sewage system, drinking water).
- **Studies can be criticized:** partial environmental indicators, cross-section data, relocation effects missed.
- **De-linking temporary or 're-linking':** N-shaped curve.

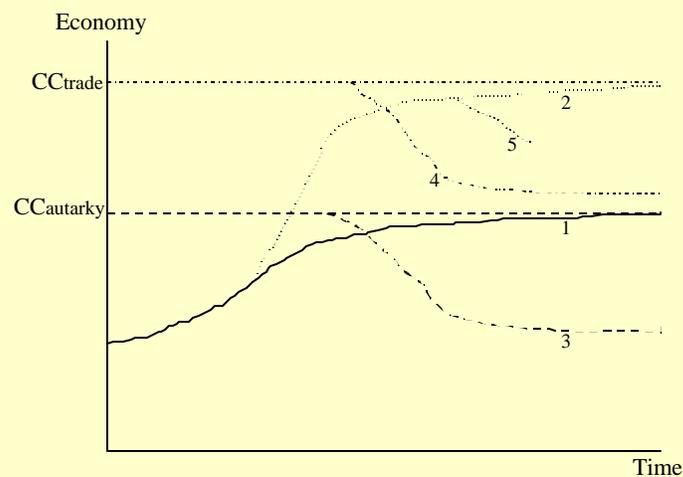
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3. International trade

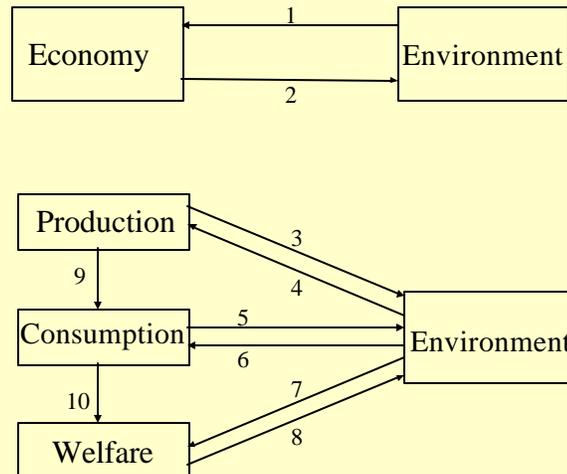
- **Free mobility of capital and multinationals:** absolute advantages, environmental damage.
- **Autarky and regional sustainability.**
- **Ecological footprint:** strong sustainability indicator.
- **Globalization:** loss of cultural diversity.
- **Mix of economic, ecological, social-cultural and political insights needed.**

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Two variable carrying capacities



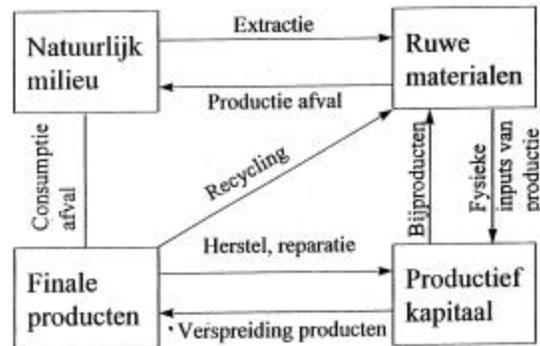
4. Economy-environm. interactions



Extensions by EE

- **Disaggregation/detail:** sectors (dirty/clean, resource-based), resources ((non)renewable, air/water/soil, ecosystems).
- **Adding temporal dimension:** accumulation of pollution, resource exhaustion/degradation, delayed effects, population growth, investments, technical change.
- **Adding spatial dimension:** land use, transport, trade, location choice, dispersion, diffuse pollution.
- **Adding material/energy dimensions.**

Materials in economy-environment



Figuur 1. Fysieke stromen in de economie, en tussen het milieu en de economie, volgens de analogie van "industriële metabolisme" (naar Ayres, 1998).

5. Multilevel dynamics

- **Populatiodynamics.**
- **Ecosystem succession - climax.**
- **Fluctuations:** disturbance, stability and resilience.
- **Cyclical patterns:** Holling 4-box model.
- **Evolution:** natural, human-induced (agriculture).
- **Co-evolution:** populations, economy-ecosystems, spatial arrangements.

Hierarchy of processes

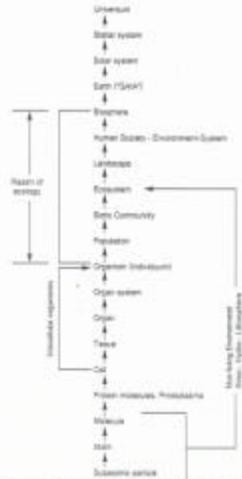
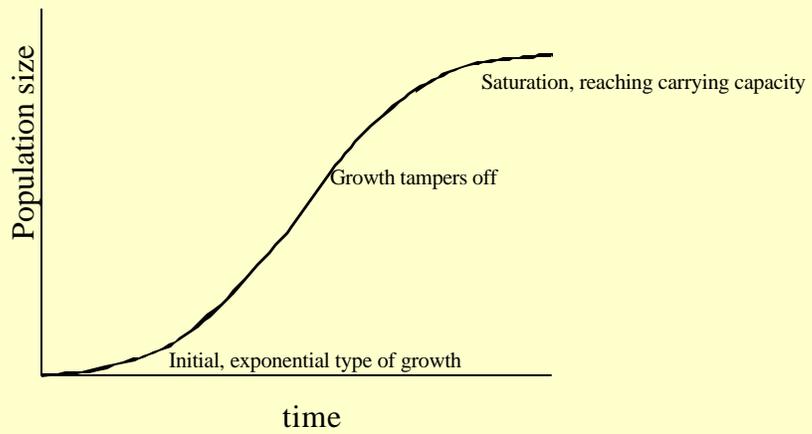
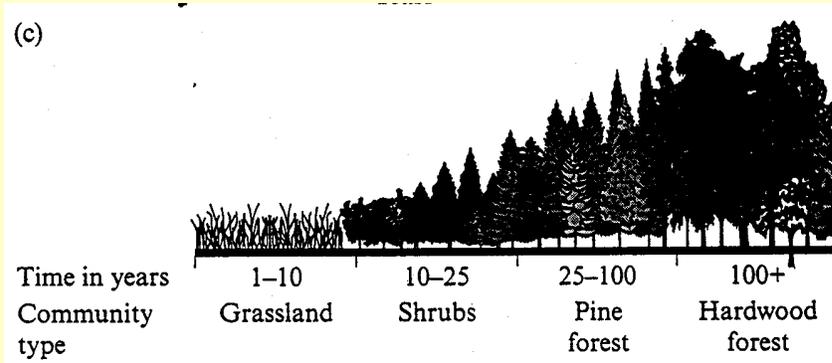


Figure 2.1 Hierarchy of levels of organization of living and living system (from Khan)

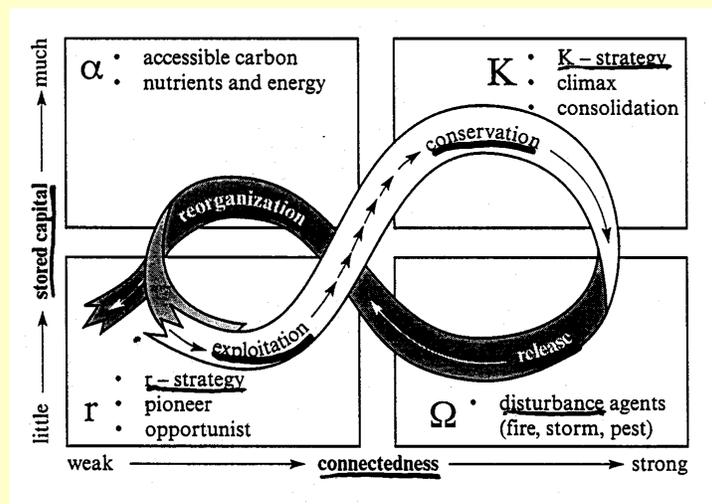
Logistic growth



Ecosystem succession



Cyclical: Holling 4-box model



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6. Behaviour and policy

- **Alternative models of behaviour:** satisficing, lexicographic. preferences, habits/routines, imitation (social context), relative income/welfare, changing/endogenous preferences.
- **Price instruments less effective.**
- **Preferences can be influenced.**
- **Precautionary principle:** “Safe minimum standards”, “Environmental bonds”.

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Differences EE/ERE summarized

- **Scale / Allocation.**
- **Precautionary principle / Efficiency.**
- **Sustainable Development / Growth.**
- **Physical / Value dimensions.**
- **Integrated modelling / Externalities.**
- **Bounded rationality/ Rational *Homo economicus*.**



Conclusions

- **No simple opposition between EE & ERE:** various subtle differences in starting points as well as approaches.
- **Pluralism in EE is essential for pluralism in policy debates:** often missing now.



Literature

- **Survey papers with different perspectives:** Turner-Perrings-Folke, Martinez-Alier, Turner, Norgaard, Spash, & van den Bergh.
- **Paper on which this lecture is based:** J.C.J.M. van den Bergh, 2001. Ecological economics: themes, approaches, and differences with environmental economics. *Regional Environmental Change*, vol. 2, pp. 13-23 (<http://www.springer.de> or [...//link.springer.de](http://link.springer.de)).

