



How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?



The Coin

The words ecology and economy share common roots — both originate from the Greek word "oikos", meaning "home". These common origins illustrate the fundamental link between the environment and our economy.



Limitations of GDP

- It ignores several components that do not involve monetary transactions
- It fails to assess changes in human capital, and does not account for the circulation of income among individuals, which can enhance personal and social wellbeing
- It counts every expenditure as positive and does not discriminate welfare-enhancing activity from welfare-reducing activity
- It ignores different visions of the goals of development, such as cultural differences, overlooking inequities.
- It ignores environmental costs, natural resource depletion rates, and, contradictorily; it includes the costs of environmental remediation as valuable production.
- It disregards longer-term negative consequences of short-term exploitation of the ecosystem and of eco-system's services.



Proposed alternatives and supplements to GDP

- Two main approaches :
- 1st approach - uses GDP as foundation to build a complete index:
 - greening GDP
 - Socializing GDP
- 2nd approach – indices are constructed independently of GDP
 - environmentally oriented indicators
 - socially oriented indicators



1st approach greening or socializing GDP

- Limitations:

- the subjectivity in deciding which expenses are valuable and must be added to the total and which are disruptive, and must be subtracted;
- the need for consensus on how to value social and environmental items that are not reported in monetary terms (ecosystems services, natural resources, volunteer labor or illegal activities);
- the need for consensus on how to quantify the costs of natural resources depletion;
- the subjectivity of selecting and classifying the most representative variables and/or indicators that form the basis of the indices.



2nd approach

Efforts to redefine the indicators

- **Environmentally oriented indicators**
 - consider the environmental limits to develop and growth.
 - designed to monitor carrying capacity, instead of measuring societal progress
- **Socially oriented measures**
 - based on the judgments of the survey respondents
 - cultural differences make it complex to compare the results across different ethnic, gender, age, religion, and other cultural boundaries.



2nd approach

Combining social and environmental concerns

- Composite indexes
 - merge different measures into a single number consisting of GDP plus social and environmental concerns
 - uncertainty and methodological approaches are still foremost issues both in constructing the indices as well their use by decision makers.
 - social and environmental development may have opposite directions.
- Set of indicators
 - troublesome to understand by the general public and stakeholders
 - allow incomplete or biased interpretations by groups with particular interests or limited knowledge.



What indicators may be used to evaluate progress?

- All attempts to measure progress have attracted criticism regarding:
 - valuation techniques and methods
 - limitations and scope.



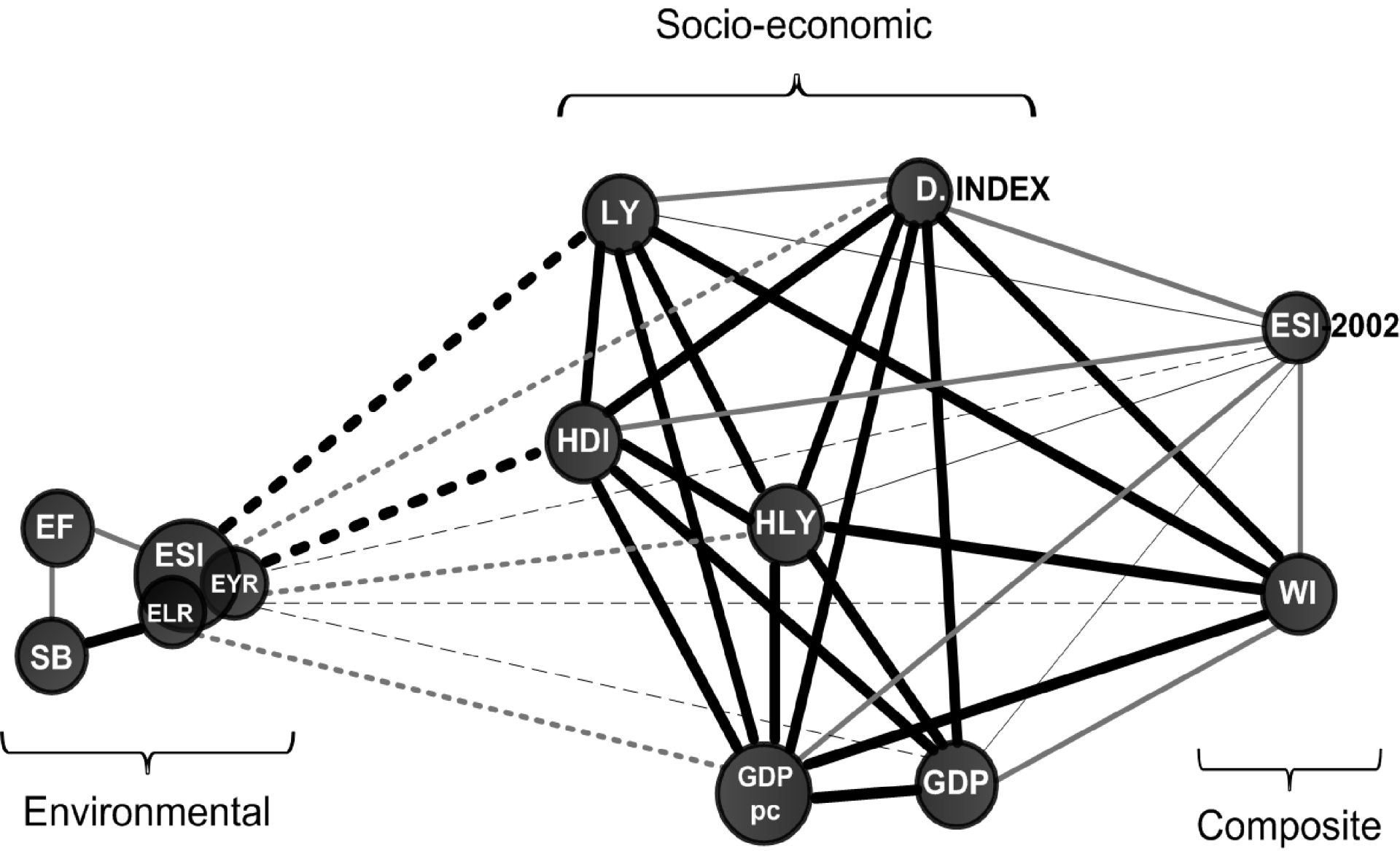
Can measures of well-being and progress help societies to achieve SD?

	GDP	GDPpc	HDI	HLY	LY	D. Index	EF	SB	WI	ESI-2002
R	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
N	0.6	0.2	0.2	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F	0.9	0.5	0.5	0.5	0.5	0.3	-0.4	-0.3	<0.1	<0.1
EYR	-0.2	-0.4	-0.4	-0.3	-0.4	-0.4	0.3	0.5	-0.2	<0.1
ELR	-0.2	-0.3	-0.4	-0.2	-0.4	-0.1	0.2	0.5	<0.1	<0.1
ESI	-0.2	-0.4	-0.4	-0.2	-0.4	-0.2	0.3	0.6	<0.1	<0.1

- R: renewable natural resources; N: non-renewable resources; F: resources from the economy; EYR: Energy Yield Ratio; ELR: Environmental Load Ratio; ESI: Environmental Sustainability Index; GDP: Gross Domestic Product (GDP); GDPpc: Gross Domestic Product (GDPpc), HDI: Human Development Index, HLY: Happy Life Years, LY: life years, EF: Ecological Footprint; SB: Biocapacity Surplus; Democracy Index (D. Index); WI: wellbeing Index, ESI-2002: Environmental Sustainability Index-2002.



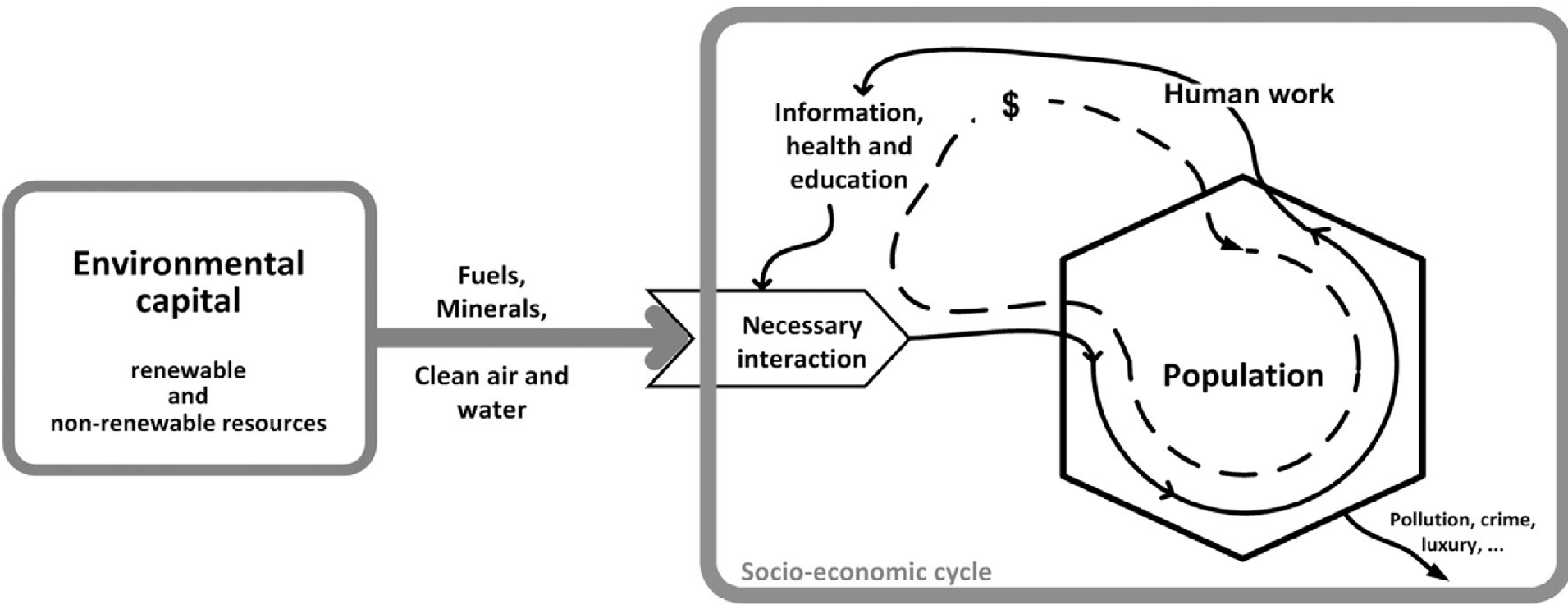
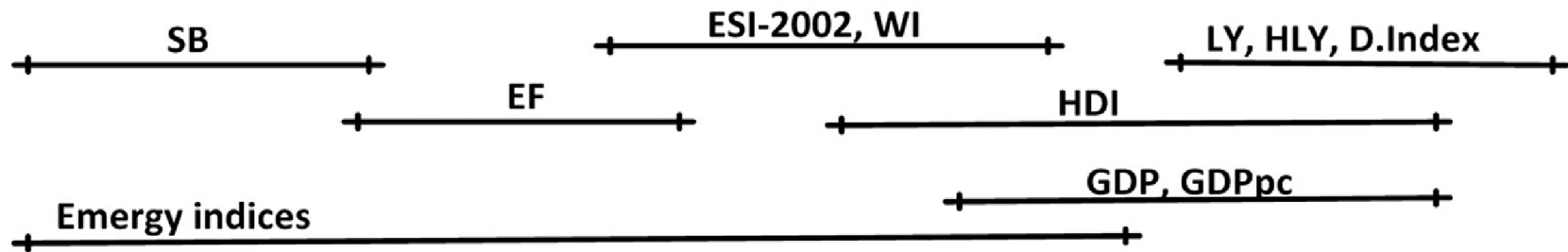
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Can measures of well-being and progress help societies to achieve SD?

Sustainability dimensions





Redundancy		
Socio-economic		
Biophysical		
Complementarity →	GDP	R
	GDPpc	
	HLY	EF
	LY	SB
	D. Index	EYR
	HDI	ELR
	WI	ESI

Where: R: renewable natural resources; N: non-renewable resources; F: resources from the economy; EYR: Emergy Yield Ratio; ELR: Environmental Load Ratio; ESI: Environmental Sustainability Index; GDP: Gross Domestic Product (GDP); GDPpc: Gross Domestic Product (GDPpc); HDI: Human Development Index, HLY: Happy Life Years, LY: life years, EF: Ecological Footprint; SB: Biocapacity Surplus; Democracy Index (D. Index); WI: Wellbeing Index.



All attempts to measure progress have attracted criticism regarding certain valuation techniques, limitations and scope.

Consequently, there is a need for a global dialogue and consensus on these issues, and there are still some questions that need help from the academic, social and political communities to be answered.



- *How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?*
- *What indicators may be used to evaluate progress the Future Post-Fossil Fuel Society?*
- *How will they be measured?*
- *What can be done within the possibility of the existing accounts?*
- *Who will select those indicators for in the Future Post-Fossil Fuel Society?*
- *To whom those indicators are of interest in the Future Post-Fossil Fuel Society?*