

Economics of Sustainability and Environmental Justice

J. Martinez-Alier

(ICTA-UAB, Barcelona)

Rome 16-17 June 2008

INTERNATIONAL SOCIETY FOR ECOLOGICAL ECONOMICS

- “ www.ecoeco.org (founded in 1989 by Herman Daly, Bob Costanza, Dick Norgaard, Charles Perrings... in the steps of Nicholas Georgescu-Roegen, Kenneth Boulding, K.W. Kapp). Appreciation for the Club of Rome among ecological economists, e.g. Denise Meadows's speech at one of early ISEE conferences.
- “ ISEE Tenth Biennial Conference.
Nairobi, 7-11 August 2008 (with UNEP)

The Metabolism of Society

- “ Podolinsky’s study of energy flow in agriculture (1880), the first calculation of the EROI . energy return on energy input.
- “ Lotka’s essential distinction in 1911 between endosomatic use and exosomatic use of energy by humans.
- “ Georgescu-Roegen’s ‘metabolic flow’, in his book *The Entropy Law and the Economic Process*, 1971.
- “ ‘Industrial metabolism’, ‘Industrial ecology’ (R.U.Ayres, 1989).
- “ Hence the idea of characterizing countries and regions in terms of their metabolic profiles, and studying socio-ecological transitions (Fischer-Kowalski, Haberl, 2007).

Why economic growth is not ecologically sustainable

- “ The industrial economy depletes resources and overloads the sinks. EROI is decreasing.
- “ Hubbert's peak oil is approaching, this leads to more use of natural gas but also more coal.
- “ Carbon dioxide concentration in atmosphere increasing 2 ppm per year.
- “ Energy cannot be recycled, and materials are recycled only to a small extent.
- “ Improvements in resource productivity might lead to Jevons's Paradox or rebound effect.

CONFLICTS AT THE COMMODITY FRONTIERS

- “ Search at the commodity frontiers to substitute for dissipated energy and materials, and bring in new supplies.
- “ In resource extraction conflicts, some actors deploy the **language of indigenous environmentalism**, i.e. territorial rights and ethnic resistance. Convention 169 of ILO is used, or in India the protection of adivasi peoples by the Constitution (Fifth Schedule).
- “ The **universal language of human rights is also used since livelihoods are threatened**. These are non-economic languages.

Indicators and indices of (un)sustainability

- “ I take here the perspective of **strong sustainability**.
- “ **Weak sustainability** (economic valuation of environmental services and environmental damages) is also relevant in a market society.
- “ In **strong sustainability** physical indicators/indices: **Material Flows / Energy Flows / HANPP** (human appropriation of net primary production of biomass) are used.

Economic, social and environmental objectives

- “ A modern Prime Minister must be able to speak in different languages.
- “ The GDP has grown 3% in real terms, the country has advanced two positions in the HDI, but HANPP has increased 5%, while the Material Flows have increased pari passu with GDP and so have GHG emissions.
- “ Is the country better off?

Social Metabolism

- “ Ecological economists see the economy as a system open to the entry of energy and materials, and to the exit of waste. E.g. chemical waste sent to Ivory Coast caused a change of government (Poisonous Days, *The Economist*, 16 Sept. 2006).
- “ In volume, carbon dioxide is the biggest waste.

Non-equivalent descriptions of the economy

“ The economy is usually seen as a merry-go-round between consumers and producers. They encounter each other in markets for consumer goods or in markets for the services of production factors. Prices are formed, quantities are exchanged.

This is CHREMATISTICS. Macroeconomic accounts (GDP) aggregate the quantities multiplied by the prices.

“ The economy may be described instead as a system of uni-directional transformations of energy and materials into useful products and services, and finally into waste.

This is BIOECONOMICS / ECOLOGICAL ECONOMICS

N. Georgescu Roegen 1966, 1971, H. Daly 1968, A. Kneese & R. Ayres, 1969, K. Boulding, 1966 : **as old as the Club of Rome.**

NO CIRCULAR ECONOMY

Chinese authors use the words 'circular economy' to express a desire for eco-efficiency. But 'circular economy' is a misleading description. Some energy and materials are taken from Nature out of current production (biomass produced by photosynthesis). Other forms of energy and other materials (the fossil fuels, the metals, and building materials) are taken from stocks formed through ancient biochemical processes.

Stocks of exhaustible resources and also of renewable resources (soils, aquifers, fisheries) are depleted. Waste is produced at rates higher than Nature can resiliently assimilate. Nature is required to grow at the rate of growth of the economy but Nature has its own rhythms of growth.

Environmental Justice, origins of the movement

Waste disposal gave rise to the notion of Environmental Racism in the United States, meaning the disproportionate pollution in areas inhabited mainly by Afro-Americans, Latinos, Native Americans.

Environmental Justice was then defined as the social movement against environmental racism, also in South Africa and in Brazil.

The language of 'fighting racism' is not that of money compensation for externalities.

Macroeconomic assessment

- “ **The economy may be described in terms of economic indicators such as growth of GDP, savings ratio, budget deficit as percentage of GDP, current account balance in the external sector**”
- “ **Social factors may be taken into account, as in demographic and public health statistics, and in the Human Development Index.**”
- “ **The economy may also be described in terms of physical indicators.**”
- “ **Economic, social, and physical indicators are non-equivalent descriptions.**”

Macroeconomic assessment

“ The economy of a country or a region may be described in the following terms: it provides 280 GJ of energy per person/year, its HANPP is 35%, material flow amounts to 18 tons per person/year of which fossil fuels account for 5 tons. Of the material flows, 6 tons are imported, 1 ton is exported. Income per capita is 27,000 €. The country occupies place 10th in the Human Development Index.

Macroeconomic assessment

- “ **Of another economy, we say that it provides only 35 GJ person/year, its materials flow amounts to only 5 tons person/year (mostly biomass), its HANPP is 60% (a heavily populated country relying on biomass with little external trade). Foreign trade is less than 0.3 ton per capita/year of exports or imports. Income per capita is only 1,800 Ö (at PPP). It occupies place 140th of the HDI.**
- “ **Different classes of people in such countries have different metabolic profiles.**

Material Flows

- “ **There has been much progress in the study of Material Flows (in tons). Eurostat (2001) has published results for European Union countries. We separate a) biomass b) fossil fuels, c) other minerals (for metal ores), d) building materials.**
- “ **Is there at least ‘relative dematerialization’? Not yet? Is there an Environmental Kuznets Curve for MF?**

Material Flows

- “ Economies are characterized by such Material Flows. Historic patterns of external trade are analyzed.
- “ Latin America exports six times as many tons as it imports. The EU imports four times as many tons as it exports.
- “ We can understand patterns of social conflicts, e.g. mining or oil conflicts, or international conflicts because of unequal access to carbon dioxide sinks (oceans) or temporary %reservoirs+ (atmosphere). Hence, a %Carbon Debt+.

Externalities as socio-environmental conflicts

- “ By looking at Material Flows, the understanding of the link between Ecological Economics and Political Economy is improved.
- “ Ecological Economics studies the relations between the economy and the environment.
- “ Political Ecology studies ecological distribution conflicts: **conflicts on the access to natural resources and services and on the burdens of pollution that arise because of unequal property rights and inequalities of power and income among humans.**

In K. W. Kapp's steps

- “ Externalities are not so much market failures as cost shifting successes.
- “ Lawrence Summers's Principle is applied in practice.
- “ Conflicts on resource extraction, conflicts on disposal of GHG and also of solid waste (*Clemenceau* sent to Alang in Gujarat), conflicts on transport (*Val di Susa* as a European case).

Energy Flows and HANPP

- “ **To complete the Metabolic Profile of a country or region we need also statistics of Energy use (not all of them included in Material Flows already: nuclear, hydroelectric, apart from biomass, fossil fuels).**
- “ **Also, the Human Appropriation of Net Primary Production (of biomass).**
 - **Relevant in India as LPG substitutes for fuelwood and dung as fuels → more biomass available for other species?**
 - **On the other hand: More agrofuels, higher HANPP, less biodiversity.**

E.g. HANPP and mangroves

- “ The HANPP of one hectare of a mangrove (converted into a shrimp farm) would be calculated as follows. The biomass production of the untouched mangrove is much greater than the actual biomass production of the shrimp farm. Of the shrimp farm production almost all is harvested. The HANPP is here very high.
- “ Conflicts in defense of mangroves (cf. report by Environmental Justice Foundation, London) may be seen as conflicts on the HANPP.

The chrematistics of mangrove destruction

- “ Does it matter that HANPP increases? One could look at mangrove conversion in terms of economic costs and benefits (in a weak+ sustainability framework). Discounted economic benefits and costs (including the loss of human livelihoods and the environmental costs of mangrove destruction) would be compared.
- “ Here we encounter incommensurability of values. Who has the right to simplify complexity by imposing the single language of economic valuation?

Non-equivalent descriptions

- “ Ecological economics includes the economic valuation of ecosystem services and of negative externalities.
- “ However, it goes beyond this, in the perspective of ‘strong sustainability’. Which Physical Indicators or Indices (MF, Energy flows, HANPP) are required?
- “ They are not redundant, they might move differently: Material Flows up, HANPP down?
- “ Since social, economic, physical indicators are non-equivalent descriptions of reality, an integrated assessment cannot be money-reductionist (nor energy-reductionist, for that matter).

One single number?

- “ There are attempts to judge Sustainability by a single index.
- “ In monetary terms, such as Genuine Savings of the World Bank . everything reduced to a single figure in money. Not convincing.
- “ Or a physical index with a single number, such as Ecological Footprint. Useful for communication, but methodologically open to critique.
- “ Instead, we propose a small group of non-redundant, independent indices (Energy / Materials Flows/ HANPP / GDP / Social indicators).

Social relevance of physical indicators

- “ **How to make the indicators of social metabolism relevant? Some of them are already relevant: e.g. carbon dioxide statistics.**
- “ **Sometimes, academic research leads the discussion, e.g. on Material Flows or HANPP. Then statistical offices pick them up.**
- “ **Then, there is a third step: social or political actors will use the physical indicators for policy or for agitation.**
- “ **However, the supply of statistics does not always create the social demand for them.**

INDICATORS OF (UN)SUSTAINABILITY FOR ENVIRONMENTAL JUSTICE ORGANIZATIONS (EJOs)

- “ To repeat: Ecological conflicts arise because of the increased use of materials and energy in the economy, and the increased production of waste (GHG, etc.)
- “ The indicators of (un)sustainability are relevant to the work of the EJOs, the local organizations active worldwide in the environmentalism of the poor. They form international networks (such as Oilwatch).

Ecologically Unequal Trade

- In an ecological-economics theory of unequal exchange, attention is drawn to physical measurements, focusing on the unequal amounts of energy (or exergy, i.e. available energy), or materials (in tons), or land used up.
- Then, “market prices are the means by which world system centres extract exergy from the peripheries” (Hornborg, 1998), helped sometimes by military power.
- Think also of Internal Trade between regions in India, China, Brazil –e.g. exploitation of Orissa giving rise to an “ecological debt”.

ECOLOGICAL DEBT

- “ **There are then claims for repayment of the so-called Ecological Debt from North to South, bringing together the ‘carbon debt’, i.e. damages from rich countries on account of past and present excessive per capita emissions of carbon dioxide, and claims because of biopiracy, and ecologically unequal exchange.**
- “ **The Ecological Debt has both moral and economic aspects.**
- “ **When resource exports are produced by TNCs, local and international demands for Corporate Liability arise, e.g. the court cases under the ATCA legislation (Alien Tort Claims Act) against Chevron-Texaco, Freeport McMoRan, Dow Chemical A**

FROM SOCIAL METABOLISM TO ECOLOGICAL DISTRIBUTION CONFLICTS

<i>Geographic scope</i> ----- <i>Stage</i>	Local	National and Regional	Global
Extraction	Resource conflicts in tribal areas, such as bauxite mining in Orissa, oil extraction in Ecuador.	Mangrove uprooting. Tree planting for export Collapses of fisheries	Worldwide search for minerals and fossil fuels, and bio-piracy by TNCs Regulation of “corporate accountability”/ liability
Transport and Trade	Complaints on urban motorways because of noise, pollution, landscape loss	Inter-basin water transport Oil/gas pipelines (e.g. Burma to Thailand)	Oil spills at sea “Ecologically unequal exchange” in large South to North material flows
Post-consumption Waste and Pollution	Conflicts on incinerators (dioxins) or ozone in urban areas	Acid rain from sulphur dioxide. Nuclear waste, Yucca Mountain, Nevada, USA	CO ₂ , CFC as causes of climate change/ ozone layer destruction POPs even in remote pristine areas Claims for a “carbon debt”

Don't forget the Political Economy of Water

Conflicts on dams (Mc Cully, 1996)

- . Narmada Bachao Andolan, Polavaram in Andhra Pradesh, complaints against the interlinking of the rivers, *atingidos por barragens* (Brazil), water transfer from the Sao Francisco river (www.irn.org).
- . **conflicts on the use and pollution of aquifers, dumping of waste into water**, or the energy required for new **desalination** projects, or the **use and prices** of water.

Virtual water (Hoekstra, A.Y. and P.Q. Hung, 2002).

- . Virtual water trade: a quantification of virtual water flows between nations in relation to international crop trade (www.waterfootprint.org)

In Conclusion

- “ **The physical indicators show that the economy is certainly not dematerializing in absolute terms.**
- “ **Hence, the raw materials and the fossil fuels are taken from the ‘commodity frontiers’, while the waste is dumped there or somewhere else.**
- “ **Therefore, an international movement of Environmental Justice or Environmentalism of the Poor is growing. This could become the strongest force for sustainability.**

In Conclusion

In the last 100 years, three main currents of environmentalism, like branches of the same river:

- “ Í Cult of WildernessÎ (John Muir in USA), c. 1900, nowadays IUCN, WWF. They lose battles and choose wrong allies (corporations instead of Environmental Justice movement).**
- “ Í Gospel of Eco-EfficiencyÎ (Gifford Pinchot in the USA, c.1900, and nowadays ecological modernization, sustainable development, eco-efficiency, Í dematerializationÎ).**
- “ Environmental Justice movement and the Environmentalism of the Poor (came to international notice only in the 1970s and 1980s: Chipko movement in India, Chico Mendes' death in Acre, Brazil, Dec. 1988 fighting deforestation). I focus on this.**

Environmental Justice: a strong force for sustainability

“Complaints against disproportionate pollution (at local and global levels, claims for repayment of the carbon debt) www.deudaecologica.org

“Complaints against waste exports from North to South.

“Complaints against Biopiracy.

“Complaints against *Raubwirtschaft*, i.e. ecologically unequal exchange, destruction of nature and human livelihoods at the commodity frontiers.

“Claims for payment of the socio-environmental liabilities of Transnational Companies.