

There is no industry in the world that **conforms less** to the **principles of capitalism** than banking does.

No industry other than **banking** has its creditors **reimbursed by the government** if it is unable to do so.

No other industry has the **monopoly privilege** of issuing the **money** that everyone else must use in order to trade and do business.

www.PositiveMoney.org

Environmental Ecological Green

Table 1.1 Symptoms of environmental unsustainability and their causes

<i>Problem</i>	<i>Principal agents</i>
Pollution	
Greenhouse effect/climate change (global)	Emissions of CO ₂ , N ₂ O, CH ₄ , CFCs (and HFCs), O ₃ (low level), PFCs, SF ₆
Ozone depletion (global)	Emission of CFCs
Acidification (continental)	Emission of SO ₂ , NO _x , NH ₃ , O ₃ (low level)
Toxic contamination (continental)	SO ₂ , NO _x , O ₃ , particulates, heavy metals, hydrocarbons, carbon monoxide, agrochemicals, organo-chlorides, eutrophiers, radiation, noise
Renewable resource depletion	
Species extinction (global)	Land-use changes (e.g. development, deforestation), population pressure, unsustainable harvest (e.g. overgrazing, poaching), climate change, ozone depletion (in future)
Deforestation (global, regional)	Land-use changes, population pressure, unsustainable harvest (e.g. hardwoods), climate change (in future)
Land degradation/loss of soil fertility ((bio)regional, national)	Population pressure, unsustainable agriculture, urbanization, unsustainable development, climate change (in future)
Fishery destruction (regional, national)	Overfishing, destructive technologies, pollution, habitat destruction
Water depletion ((bio)regional, national)	Unsustainable use, climate change (in future)
Landscape loss	Land use changes (e.g. development), changes in agriculture, population pressure
Non-renewable resource depletion	
Depletion of various resources	Extraction and use of fossil fuels, minerals
Other environmental problems	
Congestion (national)	Waste disposal, traffic

Source: Ekins (2000)

Table 1.2 Examples of economic processes that give rise to the problems identified in Table 1.1

<i>Problem</i>	<i>Economic cause</i>
Pollution	
Greenhouse effect/climate change (global)	Massive expansion of productive processes that emit greenhouse gases; increasing use of fossil fuels
Ozone depletion (global)	Emission of CFCs by manufacturers of aerosols and refrigerants
Acidification (continental)	Emissions from fossil-fuel electricity-generating plants; rapid expansion of personalized transport
Toxic contamination (continental)	A huge range of industrial productive processes
Renewable resource depletion	
Species extinction (global)	Loss of habitat caused by displacement of subsistence farmers; pressure on land caused by population increase
Deforestation (global, regional)	Corporate pressure to use previously forested land for cattle grazing or biofuel production
Land degradation/loss of soil fertility ((bio)regional, national)	Loss of traditional systems of agriculture due to population displacement and movement away from subsistence agriculture
Fishery destruction (regional, national)	Excessively intensive fishing and industrial pollution
Water depletion ((bio)regional, national)	Expansion of demand due to changing lifestyle and expanded industrial production
Landscape loss	Population pressure and removal of subsistence farmers from land
Non-renewable resource depletion	
Depletion of various resources	Needed as inputs to productive processes
Other environmental problems	
Congestion (national)	Excessive material consumption

Economic concepts:

- Efficiency - Efficiency in relation to opportunity BUT financial versus environmental
- Optimality – optimal for all – no net loss if others benefit
- Sustainability

1968 Club of Rome – gave rise to “***The Limits to Growth***” which highlighted problems of exponential growth in a number of different areas (*exponential growth leads to big numbers quickly*)

1968 Paul Ehrlich – *The Population Bomb*

Reminiscent of Thomas Malthus

$$I = P \times A \times T$$

Impact = Population X Affluence X Technology

Environmental impact of economic activity is a combination of population size, consumption level and the efficiency of technological process.

1981 Julian Simon – *The Ultimate Resource*

Argued that resources of the earth are plentiful and that human ingenuity would produce innovative technologies (became known as 'cornucopian' – horn of plenty bourn by Amalthea in Greek mythology)

Economic concepts:

E. F. Schumacher – *Small is Beautiful*, (1973) (derived from his teacher Leopold Kohr)

Was concerned with ever-increasing scales of production (economics of giantism) – believed in development outside cities to create 'agro-industrial structure' – shared scepticism of role of technology..

H. T. Odum – 'Energy Systems Language' – based on idea that nearly all energy available to fuel natural and human activity begins as heat and light from the sun; this solar energy must be transformed by natural systems (e.g. photosynthesis) and human technologies (e.g. solar PV) and stored in various forms (biomass, batteries). This “energy” could provide a kind of 'universal currency' – need to understand **embodied energy**.

***Environment, Power and Society*, (1971)** - “industrial man....eats potatoes largely made of oil”

***A Prosperous Way Down*, (2001) – 'energy descent'** – human transition to society based upon use of **renewable** rather than fossil-fuel energy.

Odum was a pioneer of attempts to put 'price' on value of ecosystem goods and services. His work provided inspiration for ecological economists such as R. Costanza and the grassroots eco-social design movement of Permaculture

Economic concepts:

M. Bookchin – 'Prophet of Localization' – warned of the dangers of the 'greenhouse effect' as early as 1964 – radical solutions.

Our Synthetic Environment, (1962) and essay *Ecology and Revolutionary Thought*, (1964)

“to maintain a large city requires immense quantities of coal and petroleum. By contrast, solar, wind, and tidal energy can reach us mainly in small packets.....To use solar, wind and tidal power effectively, the megalopolis must be decentralized A new type of community, carefully tailored to the characteristics and resources of a region, must replace the sprawling urban belts that are emerging today.” (Bookchin, 1971:74-5).

Further, in 1977 he goes on to say:

“A small or moderately-sized community using multi-purpose machines could satisfy many of its limited industrial needs without being burdened with underused industrial facilities.....The community's economy would be more compact and versatile, more rounded and self-contained, than anything we find in the communities of industrially advanced countries.” (Bookchin, 1997:25)

Came to the conclusion that concern for the environmental and social consequences of the modern industrialized economy and such recognition forms a nexus which should be tackled **holistically** before we can build a truly sustainable economy

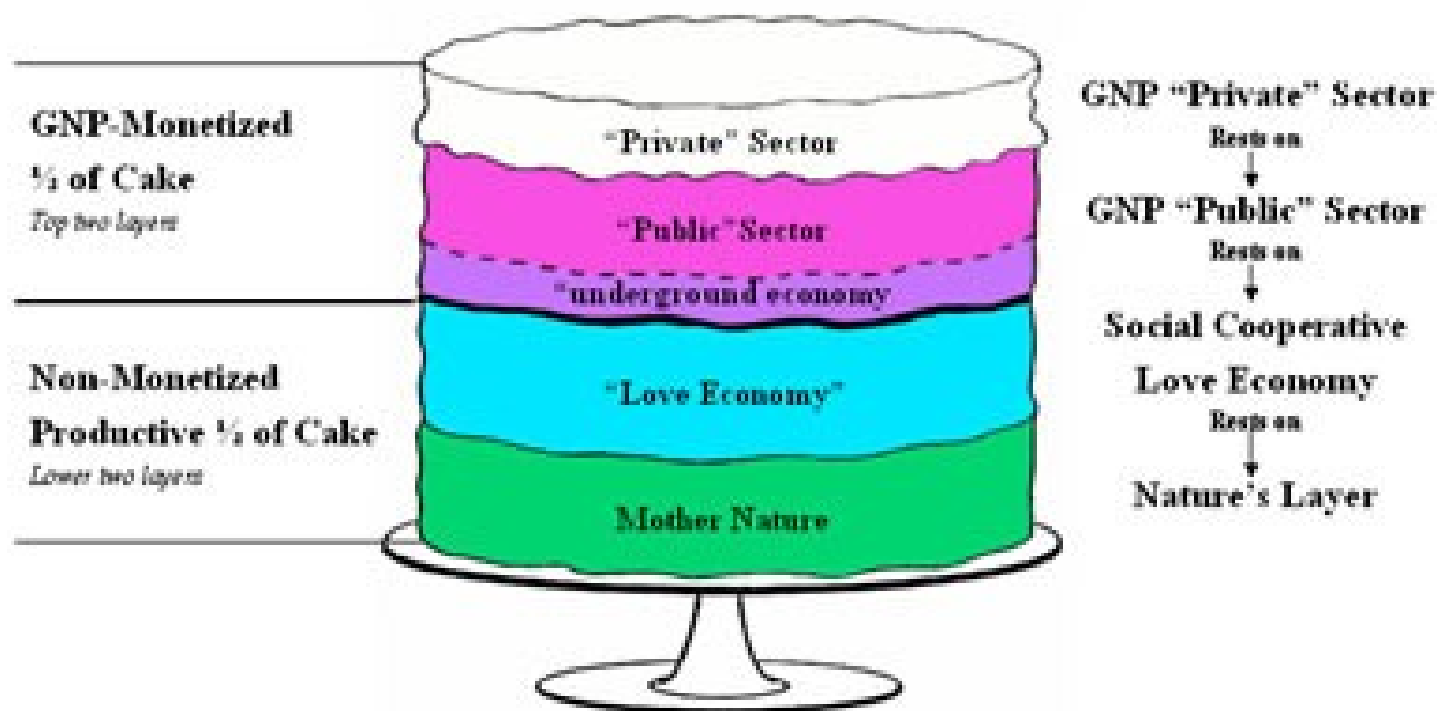
Economic concepts:

H. Henderson – *Three hundred years of snake oil: defrocking the economics priesthood* (1982)

Critical of 'free market system' drawn from Polanyi – called laissez-faire market a system of social relationships. Karl Polanyi is remembered today as the originator of substantivism, a cultural approach to economics, which emphasized the way economies are embedded in society and culture. This view ran counter to mainstream economics but was popular in anthropology, economic history, economic sociology and political science. Author of ***Origins of Our Time: The Great Transformation* (1945)** From 1924 to 1933 he was employed as a senior editor of the prestigious *Der Oesterreichische Volkswirt* ('The Austrian Economist'). It was at this time that he first began criticizing the **Austrian School of economists**, who he felt created abstract models which lost sight of the organic, interrelated reality of economic processes.

Henderson's view of a sustainable economy is one where power is stripped away from global corporations, and reinstated again in enterprises owned and controlled by their own workers based in strong, mutually orientated communities: 'worker-owned self-managed enterprises, and of bartering, sharing, self-help and mutual aid' (Henderson, 1988: 101).

Total Productive System of an Industrial Society (Layer Cake With Icing)



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Schools of Economics:

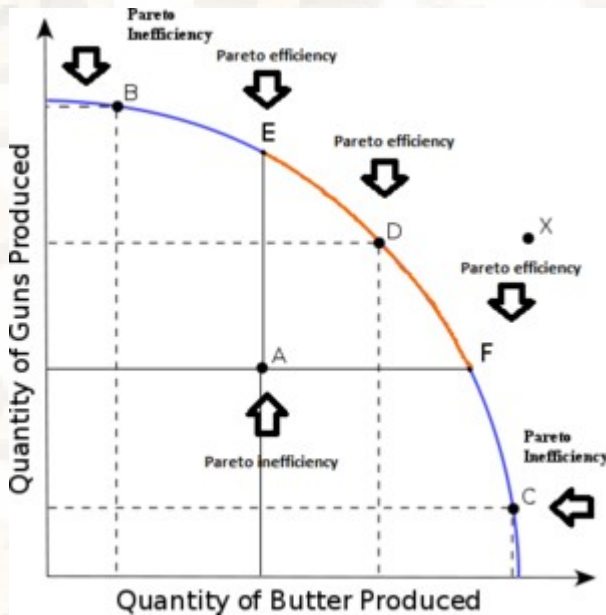
1. **Neoclassical** – mainstream approach. It is a market system which is efficient with the 'invisible hand' of the market ensuring an optimal outcome where both or all parties maximise benefit (Pareto efficient).

Environmental problems are '**externalities**' – i.e. '**market-failure**'.

The market will allocate goods efficiently and resource scarcity will be reflected by **price** which in turn will be addressed by the market i.e. the '**price discovery mechanism**' will protect scarce resources.

Definition of 'Pareto Efficiency'

An economic state where resources are allocated in the most efficient manner. Pareto efficiency is obtained when a distribution strategy exists where one party's situation cannot be improved without making another party's situation worse. Pareto efficiency does not imply equality or fairness.



<http://www.investopedia.com/terms/p/pareto-efficiency.asp#ixzz2JqMGcBHt>

Investopedia explains 'Pareto Efficiency'

Pareto efficiency has broad implications in economics, particularly in game theory. Unlike the predicted logical outcome of a prisoner's dilemma (participants choose selfishly and do not achieve the best possible outcome), if an economic state is Pareto efficient, individuals are maximizing their utility. The final allocation decision cannot be improved upon, given a limited amount of resources, without causing harm to one of the participants.

<http://www.investopedia.com/terms/p/pareto-efficiency.asp#ixzz2JqMQLwB>

Solow, (1993:74) (quoted in Gowdy and Hubacek, 2000) asserts that it is easy to substitute other factors for natural resources.....etc. In other words the neoclassical economists are not concerned about the depletion of natural resources since they believe that human ingenuity will resolve this problem by finding substitutes.

Within the neoclassical school it is sufficient to perform a **COST BENEFIT ANALYSIS**:

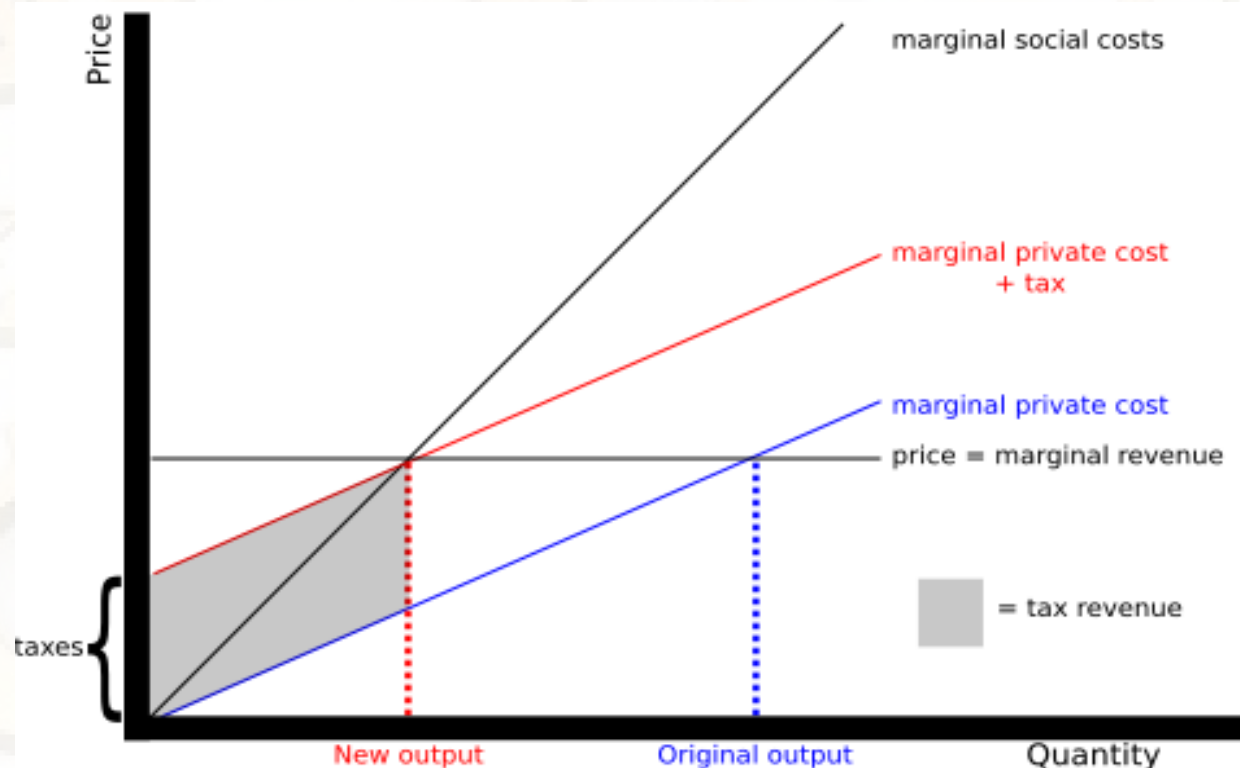
$$PV(B) = B_T / (1-r)^T$$

PV is present value of **B**enefit (or **C**ost) over Time. Time spreads the cost – but this might not be realistic e.g. Tar sands Q: over what time period might the environmental devastation be acceptable to future generations?

NOTE: This model requires that there is ever increasing growth – else if we take from future generations this may increase present worth and drive more present consumption – e.g. 'economics of extinction'

Arthur Pigou was one of the first economists to consider pollution and argued an early version of **polluter-pays principle** and proposed using taxes to deal with this **externality** to achieve efficiency of the market (**intervention**)

Pigovian tax



Schools of Economics:

2. Environmental Economics

1. Economic and Environmental systems are determined simultaneously
2. People make decisions in response to incentives and to maximise utility
3. Environmental resources are scarce
4. Markets are best way of allocating a vast range of resources
5. Environmental problems arise from 'market failure'
6. Government intervention can exacerbate the situation
7. Environmental protection costs money
8. When managing renewable resources, choosing the maximum sustainable yield is rarely optimal
9. Economic growth is not a panacea, but has vastly improved the quality of life for most people
10. Environmental problems are global, and negotiating solutions through agreement will be hard

Pearce (1998) developed concept of **Total Economic Value** (TEV) which is made up of 3 economic functions ('values'):

- 1) **Direct** – resources that can be physically extracted from the ecosystem
- 2) **Indirect** – other ecosystem services e.g. carbon sinks and pollution cleaning plants
- 3) **Option** – money that people are prepared to pay to protect the environment to derive direct or indirect benefit now or in the future
- 4) **Existence** – the intrinsic value (in monetary terms) accorded to the survival of ecosystem(s) in its own right

Total Economic Value of a rainforest

Direct Value (1)	Indirect Value (2)	Option Value (3)	Existence Value (4)
Sustainable timber	Watershed protection	Future uses under (1) and (2)	Forests as a source of spiritual value
Non-timber products	Nutrient cycling		Cultural and heritage value
Recreation	Climate change mitigation		Inheritance to future generations
Medicine	Micro-climate		Existence of species who rely on the ecosystem(s)
Plant genetics			
Human habitat			

When will be rich enough to save the planet?

The Environmental Kuznets Curve (EKC) suggests that as countries become more affluent, concern about the environment increases, leading to policies that protect it. At the same time, preferences shift away from the most environmentally damaging goods and services.

Figure 1.5 A simple interpretation of the environmental Kuznets curve



“Environmental economics may be criticized for economizing the environment rather than ecologising economics”

(Barry, 2007:240)

Schools of Economics:

3. Ecological Economics

Schools of Economics:

4. Green Economics

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