

# **Environmental Economy**

# Environmental (Green) Economy

- Most of us accept the need for a more sustainable way to live, by reducing carbon emissions, developing renewable technology and increasing energy efficiency.

- But are these efforts to save the planet doomed? A growing band of experts are looking at figures like these and arguing that personal carbon virtue and collective environmentalism are futile as long as our economic system is built on the assumption of growth. *The science tells us that if we are serious about saving Earth, we must reshape our economy.*

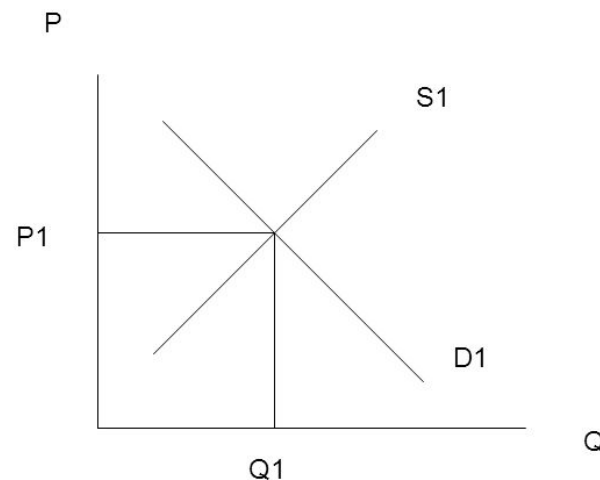
- This, of course, is economic heresy...



# Liberal economy

- main idea: **free market**, capable of self-regulation
- in the market, supply (S) meets demand (D) which the "invisible hand of the market" can return to equilibrium when changing the price (P) or quantity (Q) of goods
- **quantity x price - given by demand**
- based on the utility of the good

## Supply and Demand Graph



In a market for a product with demand D1 and supply S1 we would see P1 as the price and Q1 as the amount traded. This P and Q is where the curves cross.

# Liberal economy

A free (perfect) market assume:

- a large number of equally strong buyers and sellers
- market participants have perfect information, without a time lag
- buyers and sellers compete, and do not enter into collusions
- consumers maximize benefits, producers maximize profits
- **the producer/consumer pays the actual costs - these reflect the final price**



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## Market distortions

- incomplete information
- transaction costs (long chain of merchants)
- artificial stimulation of demand - **advertising**
- tendency to eliminate competition
  - formation of monopolies
- price distortion: **the price does not reflect the value of the goods**



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## Environmentalists' objections

- public goods and the problem of externalities
- consumption of goods vs. carrying capacity of the Earth



**BBC NEWS**



# **Externalities, Public goods, Over-consumption... What to do with it?**





# Greening of the economy

- 1) Internalization of externalities** = polluter pays principle
  - a product is disadvantaged by a higher price on the market = pressure to change technology or to perish



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## **2) Ecological tax system**

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**3) Eco-labels** - people make choices not only by price but also by other value



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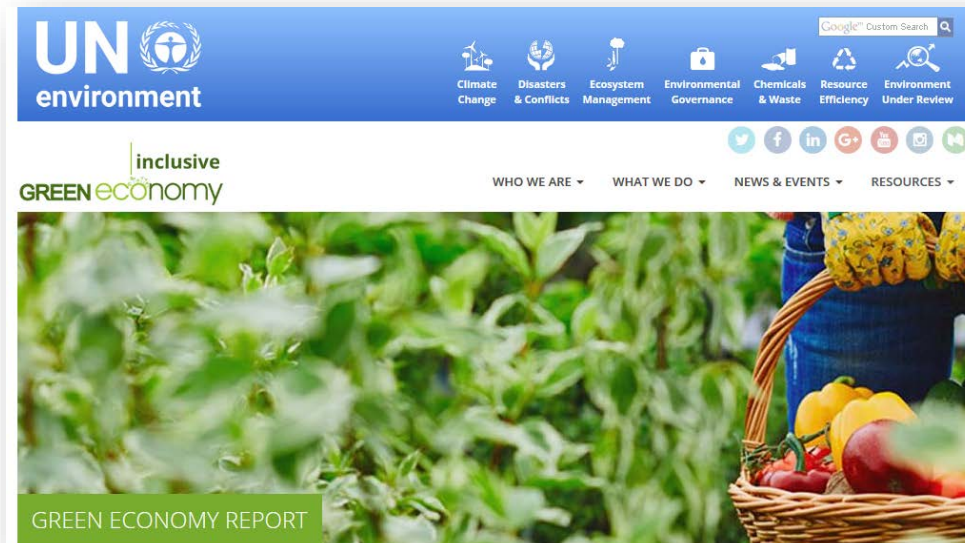
Německo



státy severní  
Evropy

# Greener economy – more radical

- change **economic indicators**
  - GDP is unsatisfactory, better - GPI, HDI or others that better reflect the real development of society



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# Radical Green economy – alternative system

- criticism of the system based on growth of GDP
- efforts to introduce **alternative systems**

*Steady state economics* (H. Daly)

*Sustainable economy* (P. Victor)





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Not everyone agrees. *Peter Victor*, an ecological economist at York University in Toronto, modelled the Canadian economy from 2005 to 2035 under three conditions:

- 1) *business as usual*
- 2) *zeroing out all sources of economic growth*
- 3) *managed transition to a steady state (sustainable option)*.



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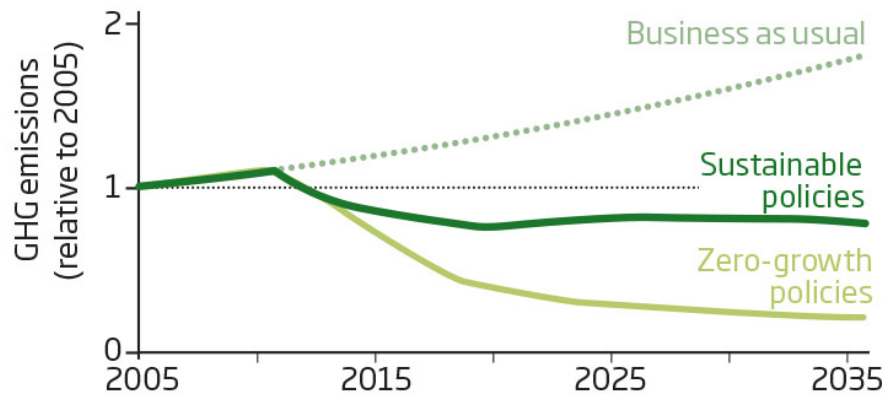
*Business as usual* produced no major surprises. The economy grew, but so did greenhouse gas emissions. Slamming on the economic brakes produced the catastrophe mainstream economists dread – GDP fell while unemployment and poverty soared.



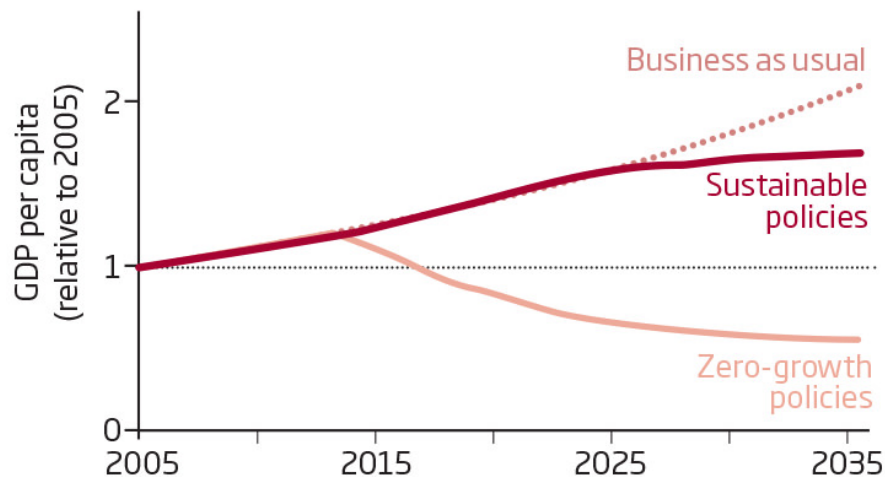
# Green and growing

Ecological economist Peter Victor has modelled the Canadian economy under three economic scenarios

With sustainable policies,  
**greenhouse gas emissions fall...**



...but **GDP continues to rise** - a combination traditionally thought to be impossible



SOURCE: P. VICTOR DOI: 10.1016/J.ECOLECON.2011.04.013

*The third scenario, which phased in a carbon tax, boosted anti-poverty programmes and reduced working hours, yielded results that mainstream economists would never have dreamed of: GDP per person rose and stabilised at about 150 per cent of current levels, while unemployment, poverty and greenhouse gas emissions all fell.*

*“It is possible for people to live well in a society in which economic stability rather than economic growth is the norm, where all its members flourish and social justice is served,” Victor concludes.*

## US green economy has 10 times more jobs than the fossil fuel industry



ENVIRONMENT 15 October 2019

By [Adam Vaughan](#)



A wind farm worker in California  
Billy Hustace/Getty

The [green economy](#) has grown so much in the US that it employs around 10 times as many people as the fossil fuel industry – despite the past decade’s oil and gas boom.

The fossil fuel sector, from coal mines to gas power plants, employed around 900,000 people in the US in 2015-16, government figures show. But Lucien Georgheson and Mark Maslin at University College London found that over the same period this was vastly outweighed by the green economy, which

# Common goods issue

- **common goods** – collective consumer goods, the consumption of which by any individual **reduce** the level of consumption of another individual
- under the influence of active demand and unrestricted access, common goods are often **abused or even looted**
- this pays also for global public goods, the use of which is not regulated by national legislation

	Excludable	Nonexcludable
Rival	<b>Private Goods</b> Food and clothing Car House	<b>Commons Goods</b> Fish in open sea Atmosphere Public waterways
Nonrival	<b>Low-congestion Goods</b> Cable television Satellite radio Online WSJ	<b>Public Goods</b> Tax-based Nuclear umbrella The law Indirect private funding Search engine On the air TV

## The Tragedy of the Commons

The population problem has no technical solution;  
it requires a fundamental extension in morality.

Garrett Hardin

At the end of a thoughtful article on the future of nuclear war, Wiesner and York (1) concluded that: "Both sides in the arms race are . . . confronted by the dilemma of steadily increasing military power and steadily decreasing national security. *It is our considered professional judgment that this dilemma has no technical solution.* If the great powers continue to look for solutions in the area of science and technology only, the result will be to worsen the situation."

I would like to focus your attention not on the subject of the article (national security in a nuclear world) but on the kind of conclusion they reached, namely that there is no technical solution to the problem. An implicit and almost universal assumption of discussions published in professional and semipopular scientific journals is that the problem under discussion has a technical solution. A technical solution

sional judgment. . . ." Whether they were right or not is not the concern of the present article. Rather, the concern here is with the important concept of a class of human problems which can be called "no technical solution problems," and, more specifically, with the identification and discussion of one of these.

It is easy to show that the class is not a null class. Recall the game of tick-tack-toe. Consider the problem, "How can I win the game of tick-tack-toe?" It is well known that I cannot, if I assume (in keeping with the conventions of game theory) that my opponent understands the game perfectly. Put another way, there is no "technical solution" to the problem. I can win only by giving a radical meaning to the word "win." I can hit my opponent over the head; or I can drug him; or I can falsify the records. Every way in which I "win" involves, in some sense, an abandonment of the game, as we intuitively un-

### What Shall We Maximize?

Population, as Malthus said, naturally tends to grow "geometrically," or, as we would now say, exponentially. In a finite world this means that the per capita share of the world's goods must steadily decrease. Is ours a finite world?

A fair defense can be put forward for the view that the world is infinite; or that we do not know that it is not. But, in terms of the practical problems that we must face in the next few generations with the foreseeable technology, it is clear that we will greatly increase human misery if we do not, during the immediate future, assume that the world available to the terrestrial human population is finite. "Space" is no escape (2).

A finite world can support only a finite population; therefore, population growth must eventually equal zero. (The case of perpetual wide fluctuations above and below zero is a trivial variant that need not be discussed.) When this condition is met, what will be the situation of mankind? Specifically, can Bentham's goal of "the greatest good for the greatest number" be realized?

*No*—for two reasons, each sufficient by itself. The first is a theoretical one. It is not mathematically possible to maximize for two (or more) variables at the same time. This was clearly stated by von Neumann and Morgenstern (3), but the principle is implicit in the theory of partial differential equations, dating back at least to D'Alembert (1717–1783).

The second reason springs directly from biological facts. To live, any



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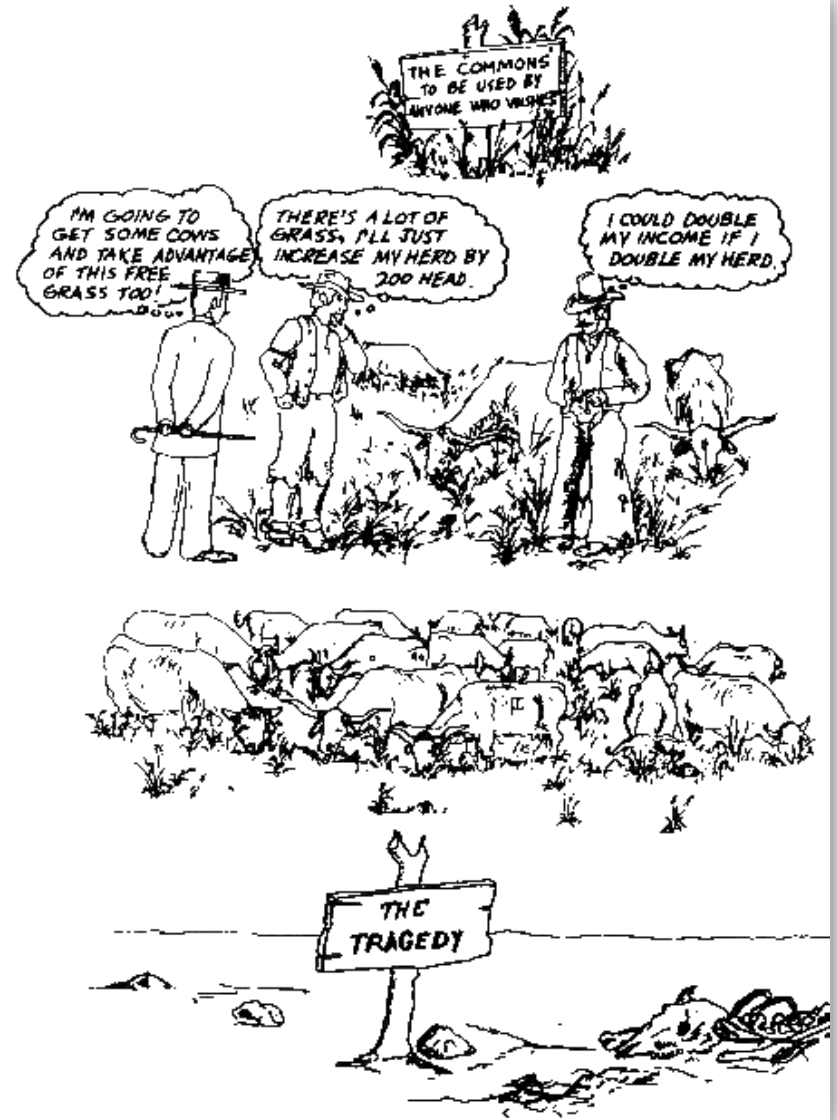
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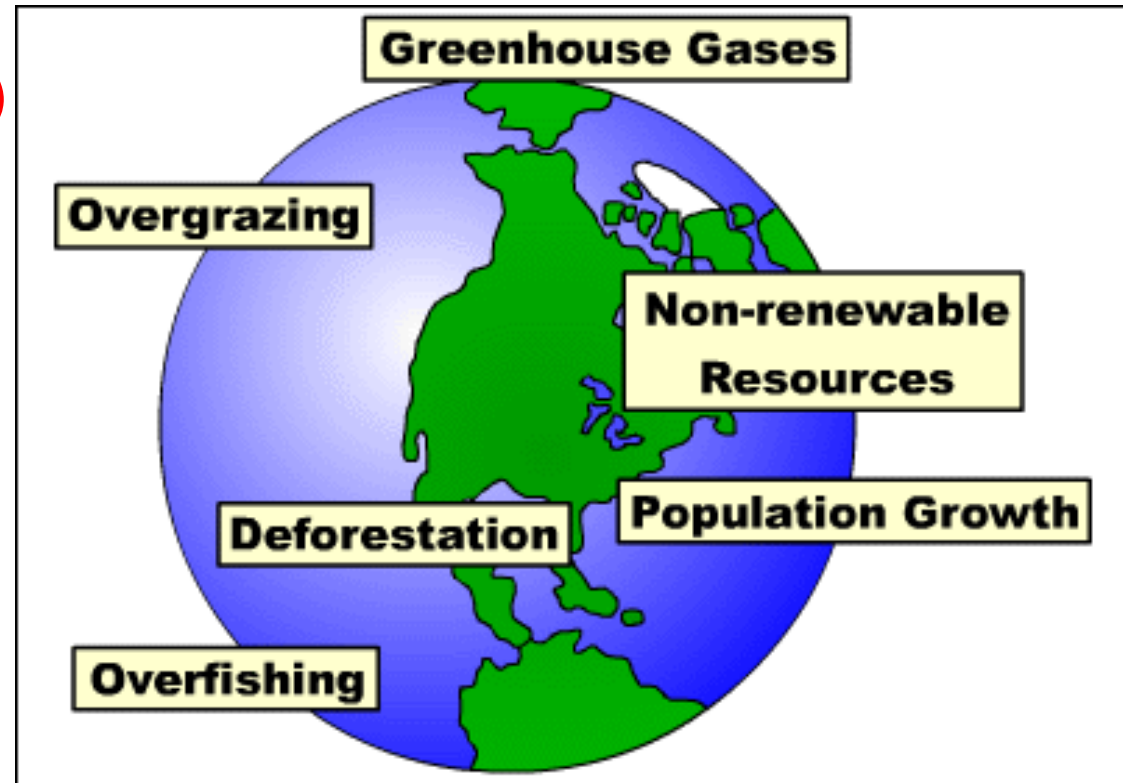


# How to prevent over-exploitation of common goods?

# The Tragedy of the Commons

„The Tragedy of the Commons“  
Garrett Hardin, *Science* (1968)

- two possible solutions:
  - Somali
  - **Tyrranical** (authority)



TRAGEDY OF THE GLOBAL COMMONS



# Price x scarcity

The degree of **scarcity** in economics is expressed by **price**

→ price - the most important source of information in the economy

→ does the **actual price correspond to the scarcity of the goods?** - NO!





# Why the price doesn't reflect a scarcity of the goods?

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## Three reasons

1) the price does not correspond to the **total value** of the goods

→ utility x non-utility value

2) **price distortions**

→ subsidies, regulation, corruption

3) externalization of costs (**externalities**)

→ not counting all costs



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According to economists, there is **no reason for the price of abundant resource**

- e.g. The price of today's forests?

→ real appreciation of natural goods can never be achieved (non-marketed

values, health, heritage, etc.) - but **it is possible to get closer**

→ market mechanisms (alone) do not ensure the maintenance of a **quality**

**of the environment**

# Value of the goods

**Total value** of the goods  
= **utility** + non-utility value

## Utility values

### 1) direct

- marketed values,
- direct benefit from the consumption

### 2) indirect

- non-marketed values,

**Figure 8. ANNUAL FLOW OF BENEFITS FROM FORESTS IN SELECTED COUNTRIES**  
(Adapted from C5 Box 5.2)

In most countries, the marketed values of ecosystems associated with timber and fuelwood production are less than one third of the total economic value, including nonmarketed values such as carbon sequestration, watershed protection, and recreation.

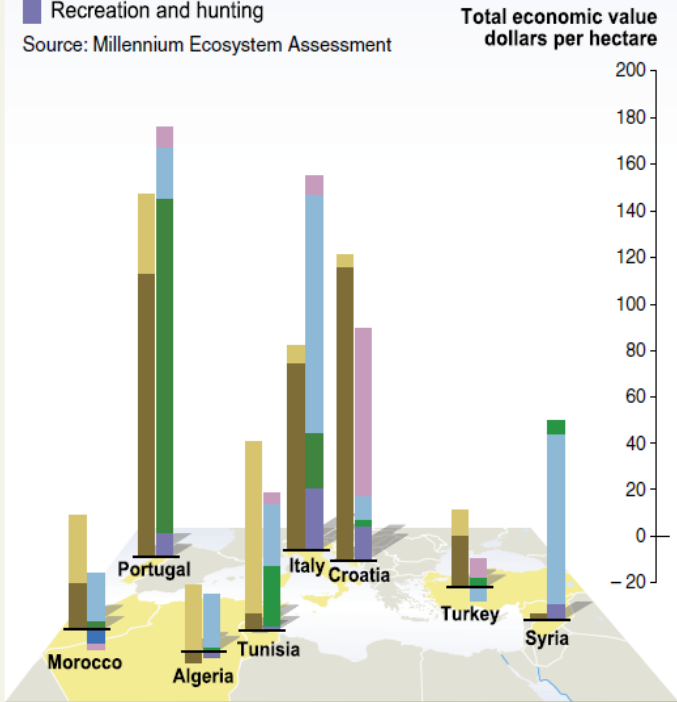
#### Left column: Commonly measured economic values

- Grazing
- Timber and fuelwood

#### Right column: Nonmarketed and other economic values

- Carbon sequestration
- Watershed protection
- Non-timber forest products
- Recreation and hunting

Source: Millennium Ecosystem Assessment





**What can be non-marketed utility values of the goods (e.g. forest)?**

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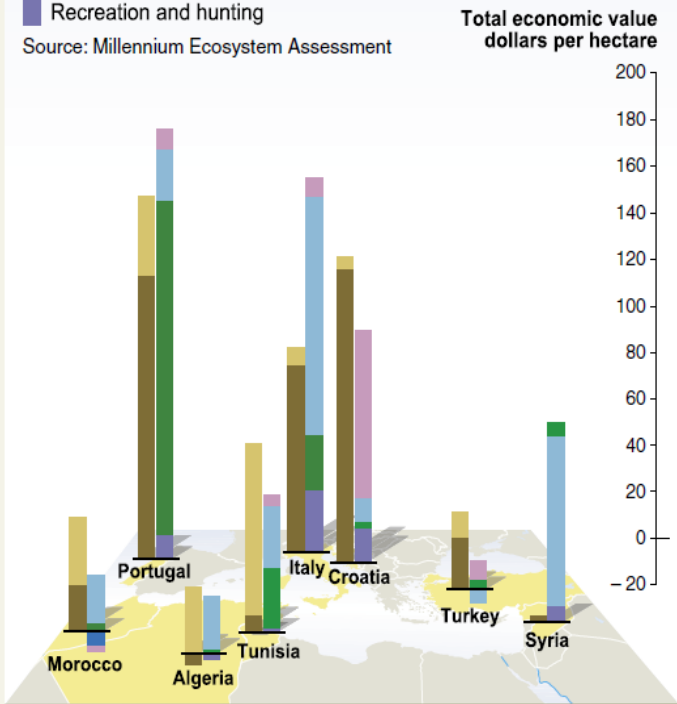
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## **Value of the heritage**

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## **Existential values**

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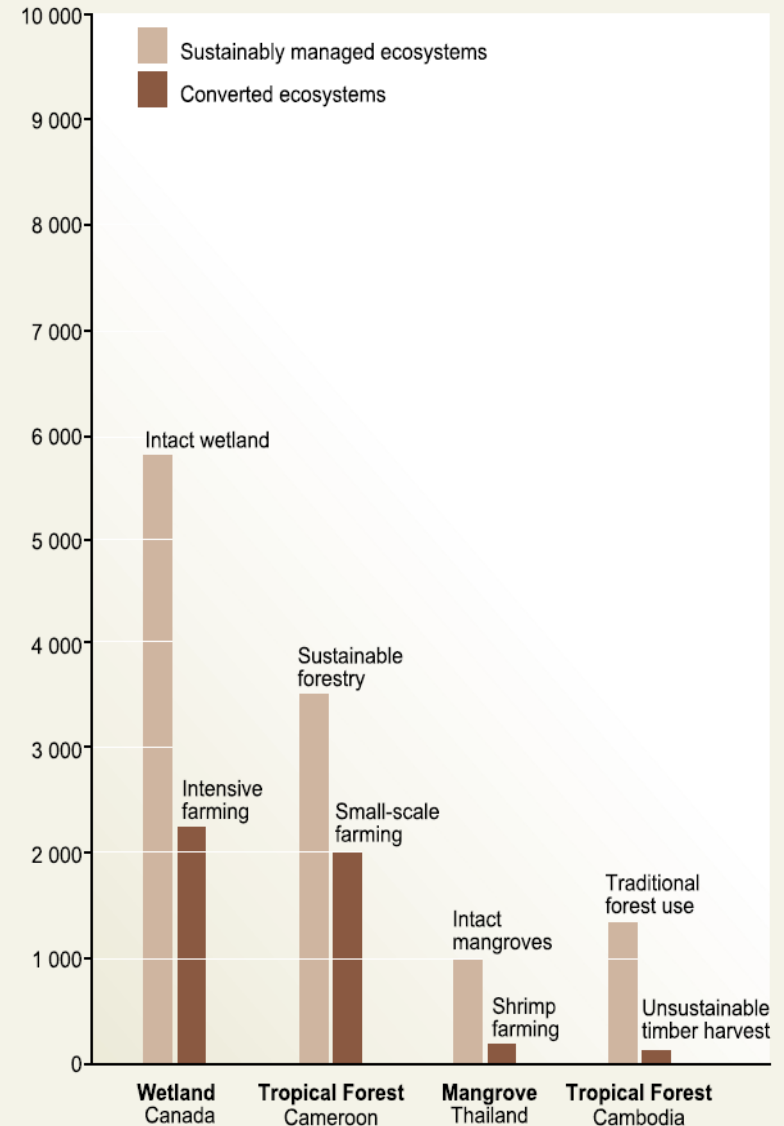
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*Economic benefits of alternative management practices.*

# Increasing of the value

Net Present Value in dollars per hectare



Source: Millennium Ecosystem Assessment

## Mangrove forest planted as tsunami shield

- › 17 December 2014 by [Fred Pearce](#)
- › Magazine issue 3000. [Subscribe and save](#)
- › For similar stories, visit the [Field Notes](#) Topic Guide

THE worst tsunami on record hit South-East Asia on 26 December 10 years ago, killing more than 227,000 people in total. I recently toured villages on the west coast of Aceh, the Indonesian province that bore the brunt of the impact, where 167,000 lost their lives when a 20-metre wave crashed ashore that morning. I also saw the results of heavy mangrove reforestation since the tsunami.

Can replanting mangrove forests on tropical coastlines really protect communities from the immense destruction of a tsunami such as the Indian Ocean killer wave that struck 10 years ago?



*„Coral reefs and mangroves of Belize yield about \$15 mil. in fish, at least \$150 mil. in tourism and about \$150 million in storm protection per year.“*



Life-saving mangroves (Image: Hemis/Alamy)

*„A 100-metre belt of dense mangroves could reduce the destructive energy of a tsunami by as much as 90 per cent.“*

# Price distortions with consequences for ecosystems

## Subsidy

- meaning:



# What is the aim (meaning) of subsidies?

# Price distortions with consequences for ecosystems

## Subsidy

- meaning: to support the desired (social) goals
- industry growth, productivity...

## **Consequences** - Increased pressure on ecos.

- eg. subsidies for pesticides → increase employment in production ↑ agricultural production, but also the overuse of "cheap" pesticides = eco. consequences, negative to the health of peasants, water contam. etc.



# Price distortions with consequences for ecosystems

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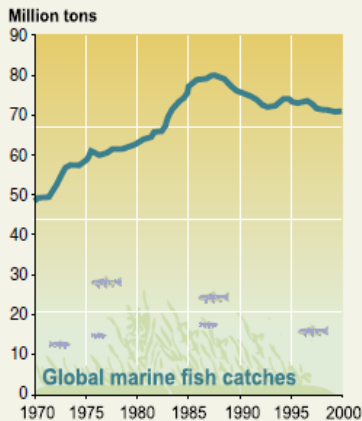
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- eg. subsidies for the **fishing industry**

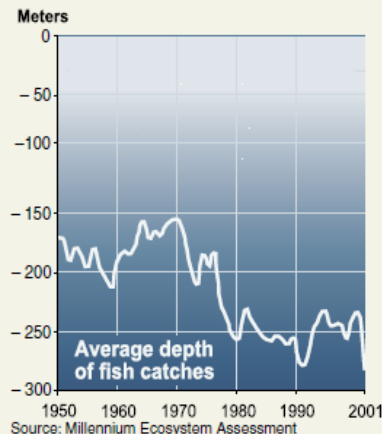
**Figure 5. ESTIMATED GLOBAL MARINE FISH CATCH, 1950–2001 (C18 Fig 18.3)**

In this Figure, the catch reported by governments is in some cases adjusted to correct for likely errors in data.

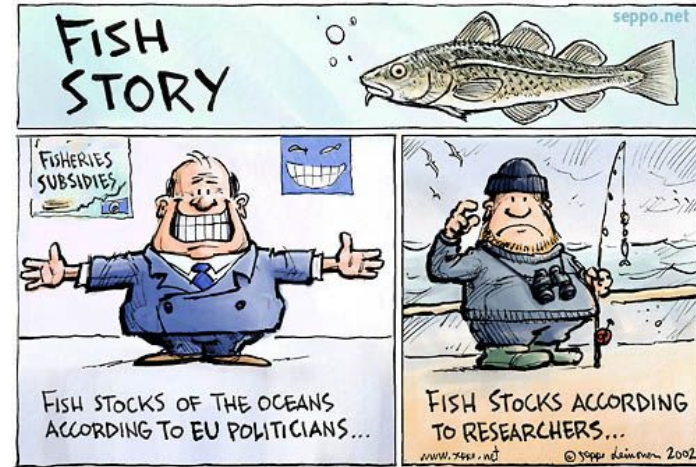


Source: Millennium Ecosystem Assessment

**Figure 7. TREND IN MEAN DEPTH OF CATCH SINCE 1950. FISHERIES CATCHES INCREASINGLY ORIGINATE FROM DEEP AREAS (Data from C18 Fig 18.5)**

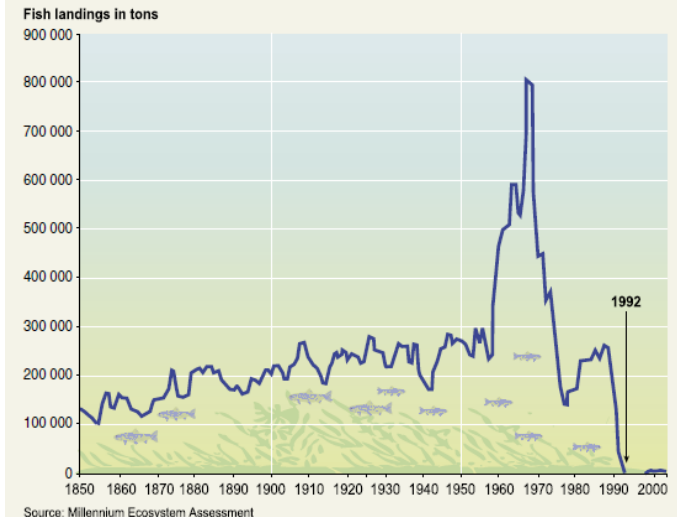


Source: Millennium Ecosystem Assessment



**Figure 11. COLLAPSE OF ATLANTIC COD STOCKS OFF THE EAST COAST OF NEWFOUNDLAND IN 1992 (CF Box 2.4)**

This collapse forced the closure of the fishery after hundreds of years of exploitation. Until the late 1950s, the fishery was exploited by migratory seasonal fleets and resident inshore small-scale fishers. From the late 1950s, offshore bottom trawlers began exploiting the deeper part of the stock, leading to a large catch increase and a strong decline in the underlying biomass. Internationally agreed quotas in the early 1970s and, following the declaration by Canada of an Exclusive Fishing Zone in 1977, national quota systems ultimately failed to arrest and reverse the decline. The stock collapsed to extremely low levels in the late 1980s and early 1990s, and a moratorium on commercial fishing was declared in June 1992. A small commercial inshore fishery was reintroduced in 1998, but catch rates declined and the fishery was closed indefinitely in 2003.



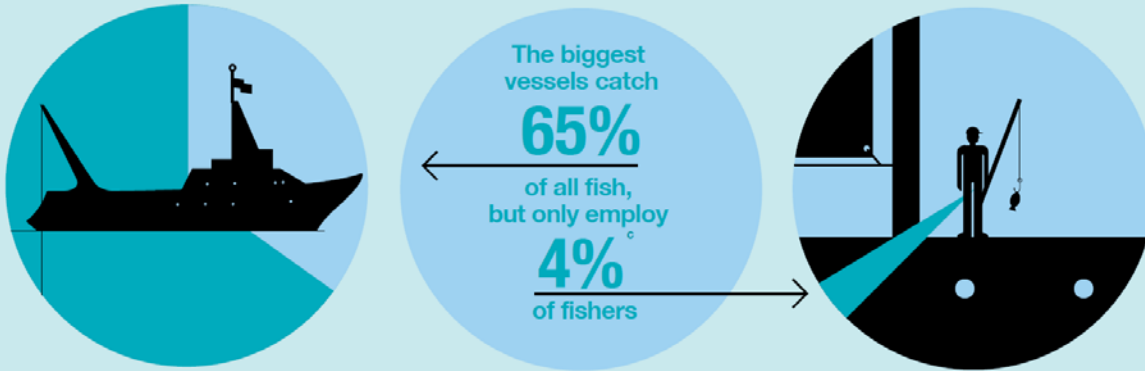
Source: Millennium Ecosystem Assessment



# Why is this important?

Overcapacity can be described as 'too many boats trying to catch too few fish'. The world's fleet is currently 2.5 times larger than is necessary to sustainably catch global fish stocks. This leads to the dangerous depletion of fish stocks. It deprives many of the world's poorest people of a crucial food source.

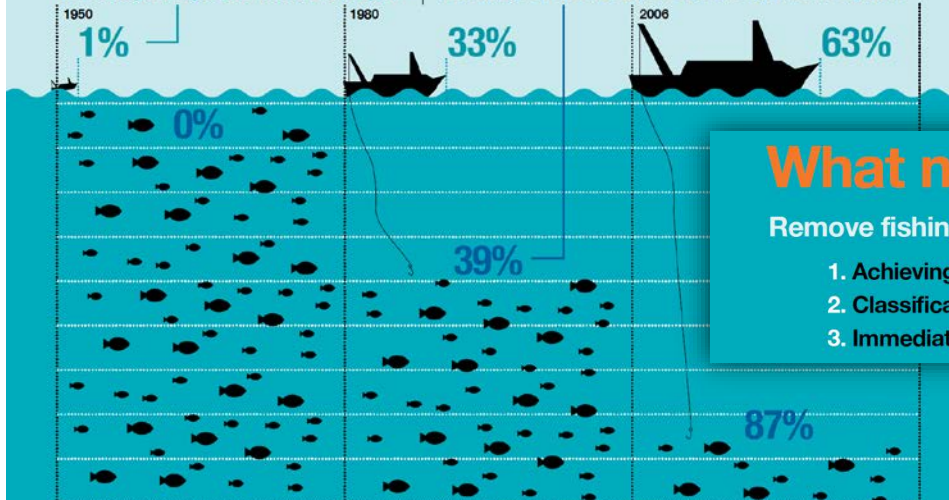
There are more and bigger fishing vessels than ever before



But productivity — the amount of fish they catch per ship — has never been lower

## There are fewer fish in the sea than ever before

Percentage of high seas fished in each year | Percentage of species exploited, overexploited or collapsed

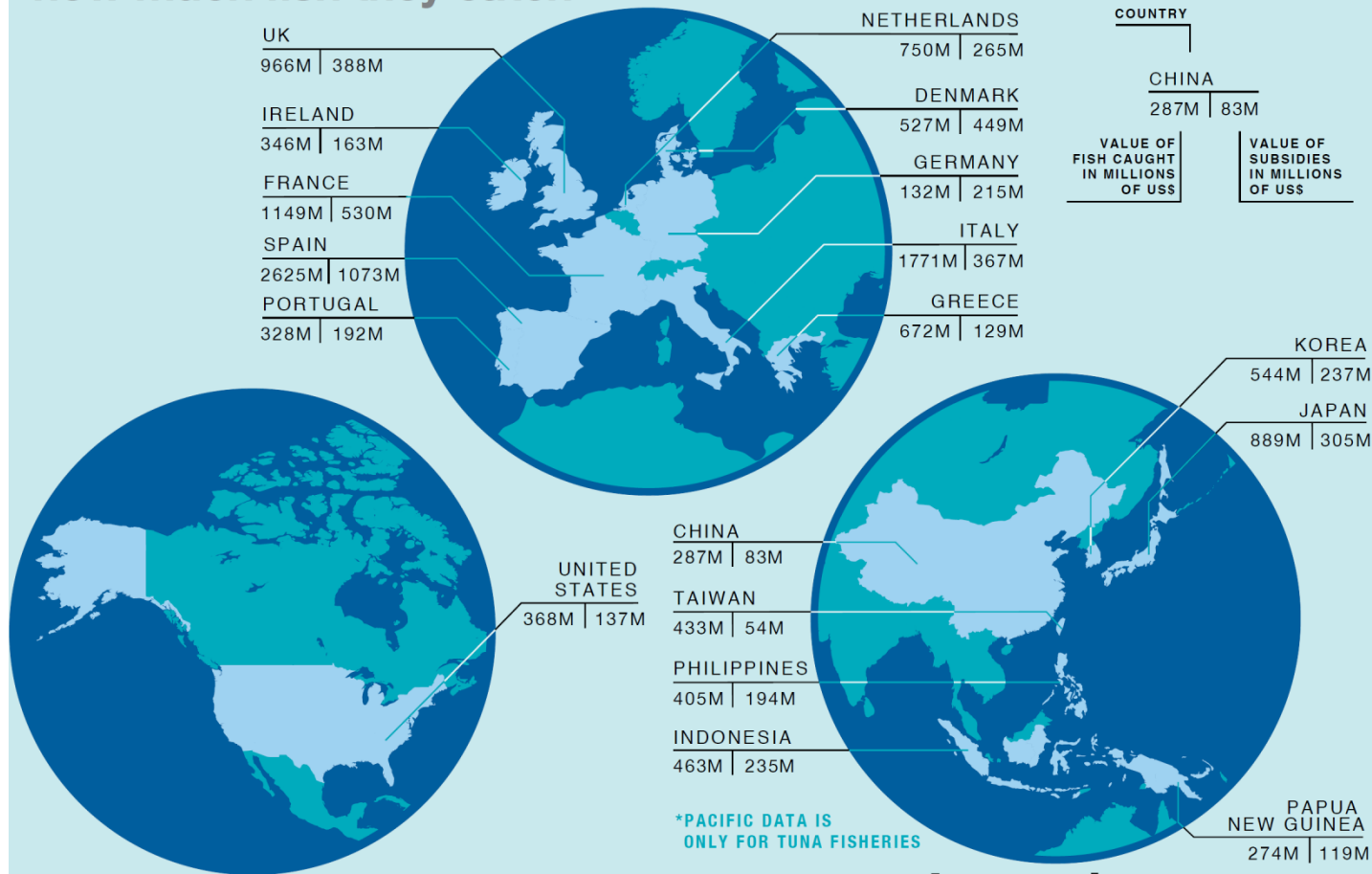


## What needs to be done?

Remove fishing vessel overcapacity by:

1. Achieving full transparency (disclosure) of fisheries subsidies.
2. Classification of fisheries subsidies in order to identify and distinguish those that are harmful.
3. Immediately capping and then phasing out high seas fishing fuel subsidies within five years.

# Where the subsidies come from and how much fish they catch<sup>a, b</sup>



\*\*THIS GRAPHIC IS INDICATIVE OF THE SUBSIDIES PROBLEM. FIGURES FOR EU COUNTRIES ARE TOTAL FISHERIES SUBSIDIES, WHEREAS FIGURES FOR OTHER COUNTRIES ONLY RELATE TO TUNA FISHERIES FLEET SUBSIDIES. THIS IS DUE TO LACK OF AVAILABLE DATA.

High seas bottom trawl fleets in 2000 (US\$):

**\$60** million  
PROFIT

**\$150** million  
SUBSIDIES

**\$600** million  
REVENUES



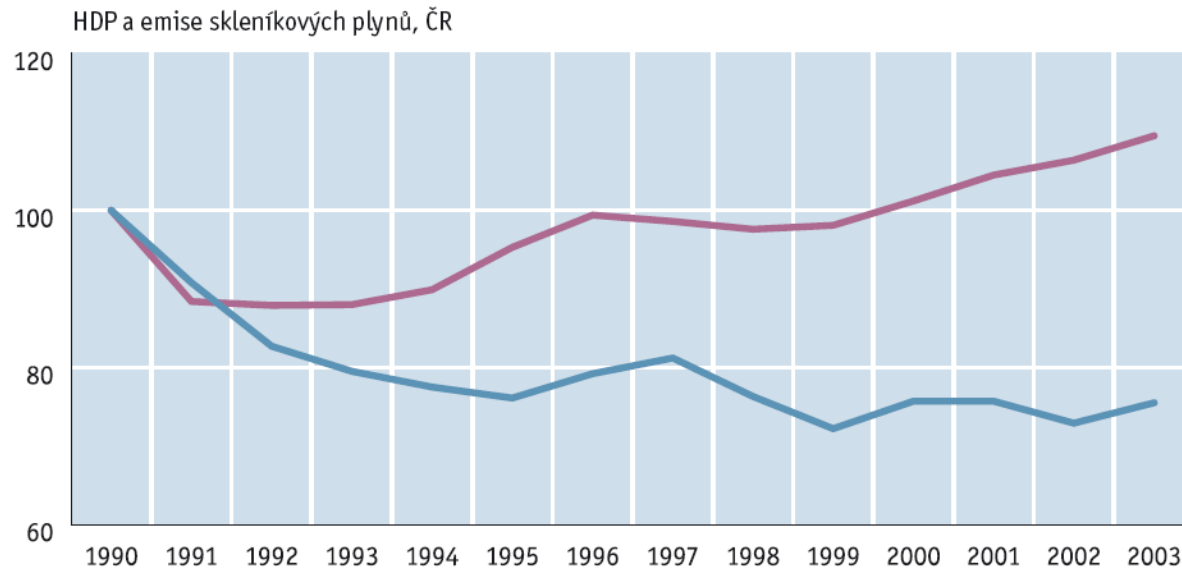
Without subsidies, the high seas fleets wouldn't make a profit. Citizens of countries providing subsidies to their high seas fleets pay twice for their fish: as tax payers and as consumers/shoppers.

# Price distortions with consequences for ecosystems

## Regulation

- a "grow now, clean up later" approach
- consequence - in China, for example, in 1998, the cost of environmental damage and pollution was 14% of GDP!

Vztah HDP a znečišťování životního prostředí (decoupling), rok 1990 = 100

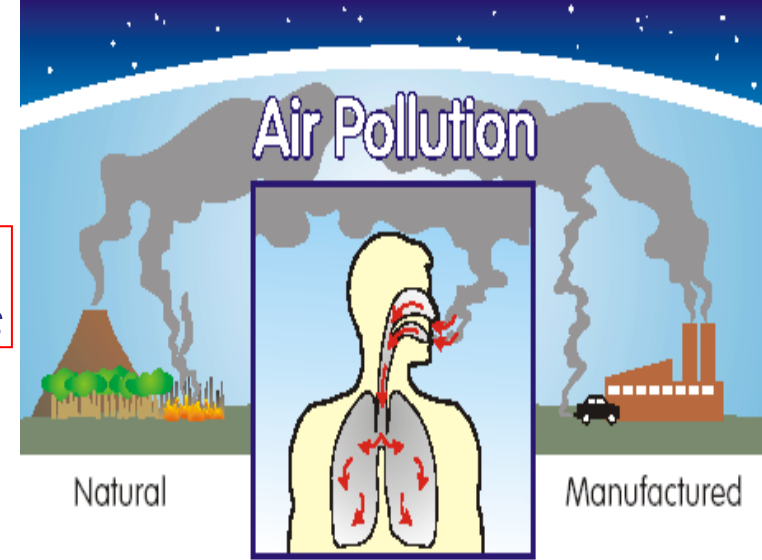


## Corruption

- embezzlement and theft of public goods with the „approval" of leaders
- price increase (due to lost profits) with a consequent increase in mining

# Externalities

*"Unintended effects of economic activity which are not reflected in market transactions"*

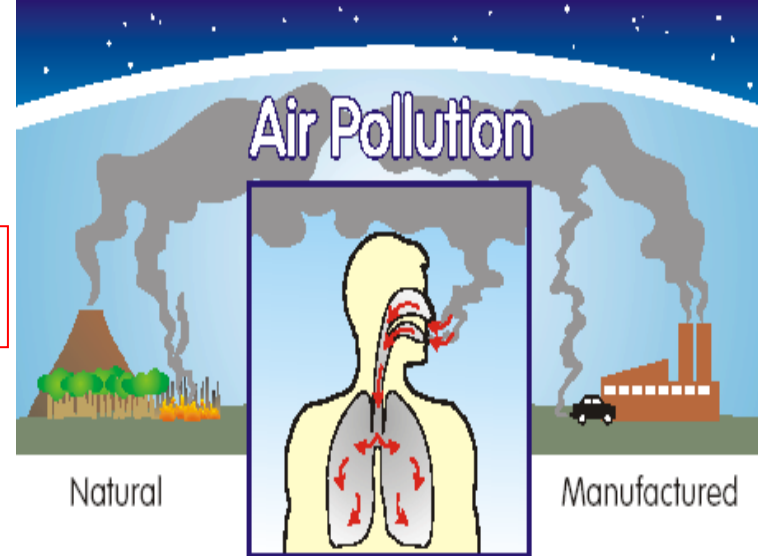


# Externalities

*"Unintended effects of economic activity which are not reflected in market transactions"*

## Positive x negative externalities

- not counting total production costs, use and disposal of products / services
- **transfer of these costs** to other market participants **spatially** (elsewhere) or **temporally** (other times)





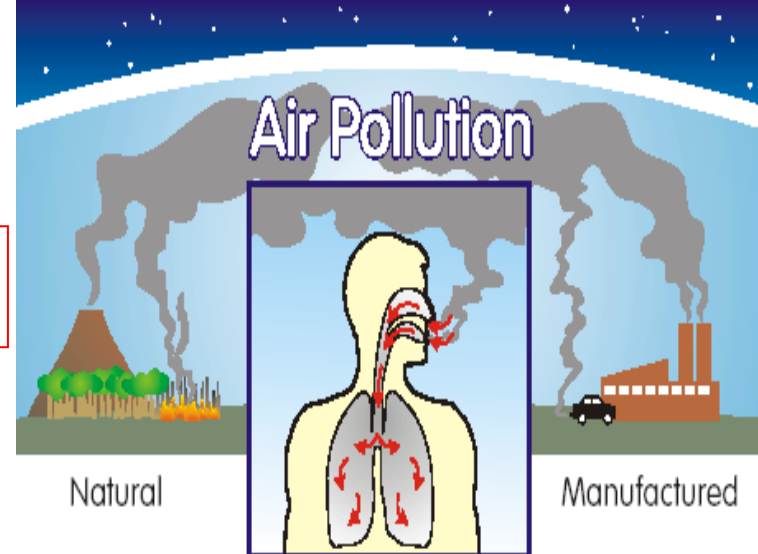
**Can you mention any specific type of positive or negative externality?**

# Externalities

*"Unintended effects of economic activity which are **not reflected** in market transactions"*

## Positive x negative externalities

- not counting total production costs, use and disposal of products / services
- **transfer of these costs** to other market participants **spatially** (elsewhere) or **temporally** (other times)
- **market damage**
- the entrepreneur does not receive the correct signal about the effectiveness of his activity
- the buyer does not receive the correct signal about the scarcity of the purchased goods (underestimation of the price of the goods)



*„Indeed, everywhere we look, we see **products whose prices don't reflect the true environmental costs** of their production.“*

T.H.Dixon, We must green the market

# My New Scientist

[Home](#) | [News](#)

## Don't ignore nature's bottom line

› 17 May 1997 by [Bob Holmes](#)  
› Magazine issue [2082](#). [Subscribe and save](#)

### Santa Cruz

---

NATURE provides the world's people with gifts worth nearly twice the value of all human economic activity each year, according to the first-ever attempt at quantifying its global value.

The economic value to people of natural processes such as climate regulation and soil formation rarely enters into the calculations of mainstream economists. But some experts have now begun to wonder whether these "ecosystem services" should be included in the balance when using economic data to analyse policy decisions.

The value of insect pollinators on world agricultural production, which accounts for their role in producing better quality and quantity of harvests, was estimated at **\$208 billion in 2005**.

That figure does not even include the retail value of what honeybees pollinate — everything from apples and cherries to broccoli and pumpkins — or the honey that bees produce. **In the United Kingdom alone, where honeybees contribute an added crop value of about \$413 million, the estimated retail value is north of \$1 billion.**




# Internalization of externalities

„Polluter pays" → burdening the polluter with extra-market costs that are otherwise involuntarily payed by the public and future generations

- including negative externalities in the price of the product

→ price increase → product not for sale → producer forced to change production to reduce negative externalities



**Can you imagine any practical issue of the  
internalisation of externalities  
(e.g. polluter pays principle)?**

# Internalization of externalities

- „Polluter pays“ → burdening the polluter with extra-market costs that are otherwise involuntarily payed by the public and future generations
- including negative externalities in the price of the product
    - price increase → product not for sale → producer forced to change production to reduce negative externalities

## Problems associated with internalization

### I) the free market model does not work in practice

- prices determine monopolies and multinational companies → risk of relocation of production to countries with ↓ costs

### II) distance of environmental impacts in time and space

- the problem of quantifying permanent externalities
- nature complex system → impacts complex, nonlinear, with long latency

### III) often lacks a clear causality of the injuring-injured

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- ### IV) nature provides its goods and services for free – common goods
- the problem of determining the price of natural services, resources and the value of nature, human health, life, and just pay for the damage at all?

# Possibilities and methods of env. valuation

- the price is formed on the relevant markets
  - for many goods there are no markets (common goods) → **underestimation**
  - valuation of the environment (natural resources) → determining the demand for the quality of nature's goods and evaluating the benefits they provide
    - assigning a certain value or price: **a necessary precondition for adequate internalisation of externalities**

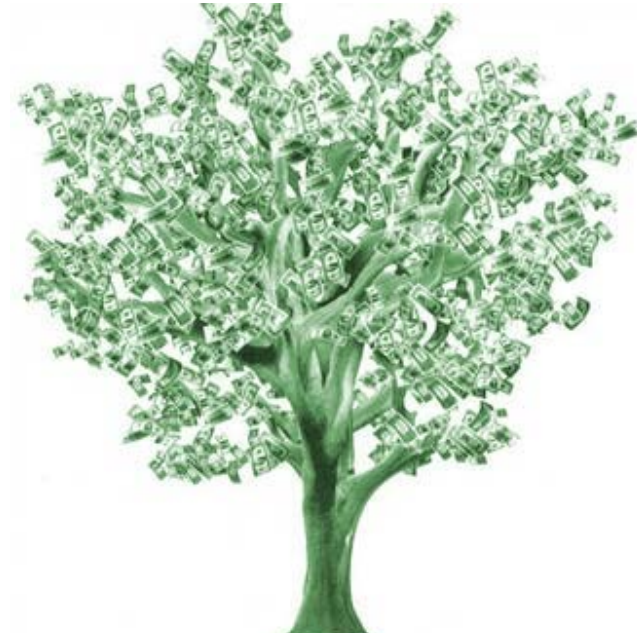
## Valuing the „real“ value of natural resources

### I) market / off-market mechanisms

- microeconomic level

### II) techniques at the macroeconomic level

### III) regulatory mechanisms (state)



# I) Market / off-market mechanisms - microecon. level

## (A) methods based on direct markets

- creation of markets for environmental goods and services - **privatization**
- the premise here is the opinion that the owner manages his private property better ...



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## (A) methods based on direct markets

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- the premise here is the opinion that the owner manages his private property better ...

## (B) methods based on proxy markets

- the methods used to find and analyze certain representative markets



**Can you suggest any proxy market for valuation of a pristine environment?**



# I) Market / off-market mechanisms - microecon. level

## (A) methods based on direct markets

- creation of markets for environmental goods and services - **privatization**
- the premise here is the opinion that the owner manages his private property better ...

## (B) methods based on proxy markets

- the methods used to find and analyze certain representative markets

## I) hedonic evaluation method

- is based on the analysis of real markets, how positive or negative changes in the quality of the environment are reflected in the price of real estate
- the price is therefore sought in the representative (real) real estate market and the difference in price corresponds to the financial value of the environment where the real estate stands

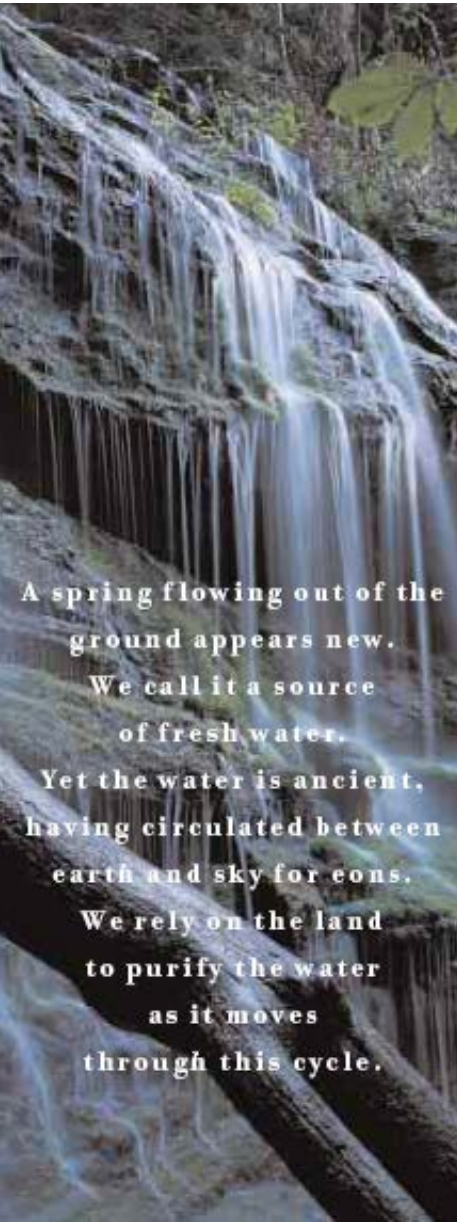
## II) travel cost method

- finds out the amounts that people spend in order to visit the recreation area → such is its "value"
- criticism: a hidden assumption - the value of a territory is determined by market behavior



# Valuation of ecosystem services

- **ecosystem** → production engines of the planet = life



A spring flowing out of the ground appears new. We call it a source of fresh water. Yet the water is ancient, having circulated between earth and sky for eons. We rely on the land to purify the water as it moves through this cycle.

## The Costs of Clean Water

Here are some global and local indicators of our dependence on the water filtration and purification services that ecosystems provide. The human and economic costs of trying to replace them can be high.

- **Percentage of the world's population that lacks access to clean drinking water:**  
28 percent, or as many as 1.7 billion people (UNICEF 2000)
- **Number of people who die each year because of polluted drinking water, poor sanitation, and domestic hygiene:**  
*5 million. Additionally, waterborne diseases such as diarrhea, ascariasis, dracunculiasis, hookworm, schistosomiasis, and trachoma cause illness in perhaps half the population of the developing world each year (WHO 1996).*
- **Percentage of urban sewage in the developing world that is discharged into rivers, lakes, and coastal waters without any treatment:**  
*90 percent (WRI et al. 1996:21)*
- **Amount spent on bottled water worldwide in 1997:**  
\$42 billion (Beverage Industry 1999)
- **Amount U.S. consumers spent on home water filtration systems in 1996:**  
\$1.4 billion (Trust for Public Land 1997:24)
- **Cost incurred by households in Jakarta that must buy kerosene to boil the city's public water before use:**  
*Rp 96 billion or US\$52 million a year (1987 prices) (Bhatia and Falkenmark 1993:9)*
- **Replacement cost of the water that would be lost if thirteen of Venezuela's National Parks that provide critical protection for urban water supplies were deforested:**  
\$103 million to \$206 million (net present value) (Reid forthcoming:6)
- **Typical cost to desalinate seawater:**  
*\$1.00–\$1.50 per cubic meter (UNEP 1999:166)*
- **Amount of open space and critical recharge area paved over every day in the United States:**  
*11.7 km<sup>2</sup> (TPL 1997:3)*
- **Estimated annual value of water quality improvement provided by wetlands along a 5.5-km stretch of the Alchovy River in Georgia, USA**  
\$3 million (Lerner and Poole 1999:41)
- **Cost to construct wetlands to help process and recycle sewage produced by the 15,000 residents of Arcata, California:**  
\$514,600 for a 40-ha system (Marinelli 1990). The city's alternative was to build a larger wastewater treatment plant at a cost of \$25 million (Neander n.d.).

# I) Market / off-market mechanisms - microecon. level

## III) methods of so-called off-market (non-market) evaluation

- eg the method of conditional (contingent) evaluation

finding a willingness to pay (for the preservation of a certain property) or a willingness to accept compensation (for damage to a certain property)

→ finding out the preferences of individuals (consumers)

*Willingness to pay*  
*Willingness to accept*

# I) Market / off-market mechanisms - microecon. level

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*Willingness to pay*  
*Willingness to accept*

*E.g. Conditional valuation of a certain area - to protect it?*

*A questionnaire survey finds out how much an individual would be willing to pay for a visit to the newly proposed protected area, and how many times he visited it.*

*E.g. 1st visit = 25 CZK, 2nd visit = 20 CZK, 3rd visit = 15 CZK etc.*

*From these values, you can construct a pseudo-demand curve. The area under the curve then corresponds to the individual's willingness to pay.*



Criticism: hidden assumption - people are consumers with a priority of personal interest

## ad II) Macroeconomic level

- efforts to assess the environmental damages objectively (eg damage to forests caused by acid rains)
- efforts to count externalities from the scientific data

### 1) Cost-benefit analysis – analysis of pros and cons

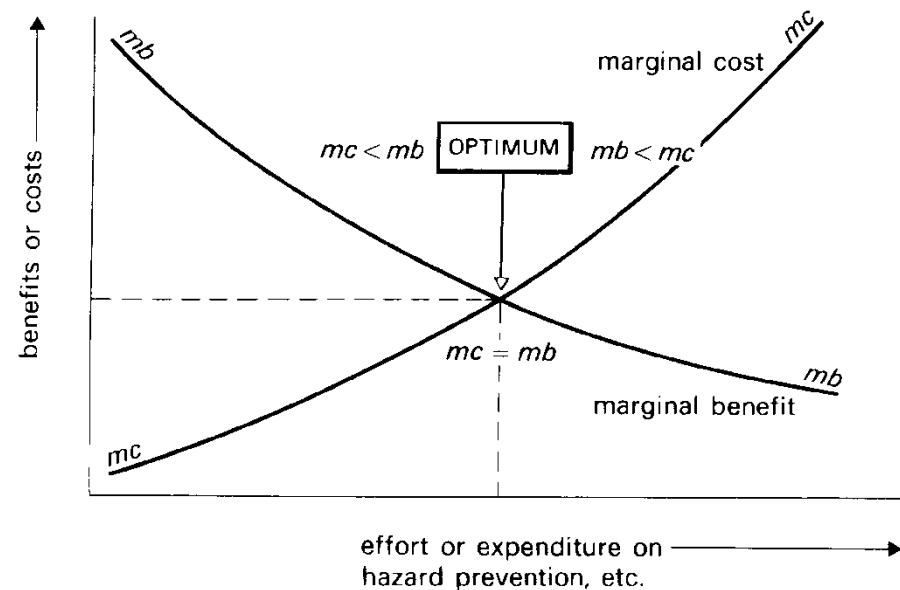
**process:** identification of **positives** (profits, benefits) + identification of **negative impacts** (losses, costs) → expression in cash → sum of all monetary values of benefits, from which the costs for the given year are deducted → project implementation only if the result is **positive**

#### criticism:

- Lots of costs and benefits are hard to express in money (difficult monetization of ecosystems)

### 2) Life cycle analysis (LCA)

- Evaluation of externalities that originates in the whole life cycle of a product or service





## Environmental Costs of Freshwater Eutrophication in England and Wales

Jules N. Pretty,<sup>\*†</sup> Christopher F. Mason,<sup>‡</sup> David B. Nedwell,<sup>‡</sup> Rachel E. Hine,<sup>‡</sup> Simon Leaf,<sup>§</sup> and Rachael Dils<sup>§</sup>

Centre for Environment and Society and Department of Biological Sciences, University of Essex, Colchester CO4 3SQ, U.K., and the Environment Agency, Wallingford, Evenlode House, Howberry Park, Wallingford, OX10 8BD, U.K.

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### Abstract

Eutrophication has many known consequences, but there are few data on the environmental and health costs. We developed a new framework of cost categories that assess both social and ecological damage costs and policy response costs. These findings indicate the severe effects of nutrient enrichment and eutrophication on many sectors of the economy. We estimate the damage costs of freshwater eutrophication in England and Wales to be \$105–160 million yr<sup>-1</sup> (£75.0–114.3 m). The policy response costs are a measure of how much is being spent to address this damage, and these amount to \$77 million yr<sup>-1</sup> (£54.8 m). The damage costs are dominated by seven items each with costs of \$15 million yr<sup>-1</sup> or more: reduced value of waterfront dwellings, drinking water treatment costs for nitrogen removal, reduced recreational and amenity value of water bodies, drinking water treatment costs for removal of algal toxins and decomposition products, reduced value of nonpolluted atmosphere, negative ecological effects on biota, and net economic losses from the tourist industry. In common with other environmental problems, it would represent net value (or cost reduction) if damage was prevented at source. A variety of effective economic, regulatory, and administrative policy instruments are available for internalizing these costs.

# Economic tools of environmental policy

- indirect influencing of entities damaging the environment
- does not operate on the basis of direct power but economic motivation

## 1) Negative stimulation

**fees** → mostly income of the SFŽP and the state budget:

- for environmental pollution (emissions to air, water, landfills)
- for the use of natural resources (water, wood, minerals)
- user fees (freons, dog fee ...)

## **taxes**

- for environmental protection (road tax, tolls, consumption tax on coal fuels)
- ecological tax reform

## **penalty payments**

- fines, surcharges – eg. for electronics





# Economic tools of environmental policy

## 2) Positive stimulation

**tax relief** (within VAT, income taxes, road taxes, real estate taxes)

**financial support** (grants, subsidies, loans)

**deposit-refund systems**

- beer bottles

**EU ETS – emission trading system**

**environmental insurance**

- environmental liability insurance - usually does not cover damage to the environment itself, to biodiversity and does not include remediation costs
- transport insurance - covers accidents during transport. substances



# Consumer intervention

## Ecolabelling

### Eco-labels



# GDP - criticism and alternatives

- the monetary value of goods and services created per year in a territory
- a macroeconomic indicator for determining the performance of national economies

## **GDP calculation**

- eg expenditure method

→ GDP = sum of following expenditures:

- personal consumption expenditure (durable goods, short-term goods, services)
- gross private domestic investment (fixed investment by companies, changes in inventories, fixed investment in housing)
- government expenditure on the purchase of goods and services

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## Criticism

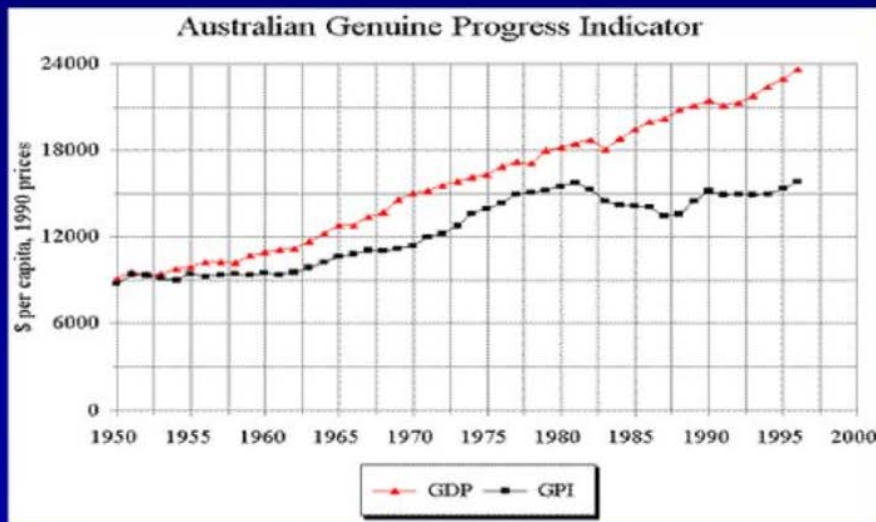
- GDP does **not include** services that people do outside the official market
  - garden work, cooking, counter-work...
  - illegal production - eg production and sale of drugs, prostitution...
- GDP **includes** the costs of liquidation of environmental damage, the fight against crime...

# GPI – Genuine Progress Indicator

- an indicator trying to better describe the quality of life in the territory
- based on GDP, from which subtracts items associated with deterioration of the environment or society, and adds new items

Cost/Benefit	Value (billions of 1996 dollars)
<b>The GPI's starting point</b>	
Personal consumption	6,258
<b>Costs ignored by GDP that are subtracted</b>	
Automobile accidents and commuting	-613
Crime and family breakdown	-93
Loss of leisure time and underemployment	-451
Air, water, and noise pollution	-108
Loss of wetlands and farmlands	-583
Depletion of nonrenewable resources	-1,497
Long-term environmental damage	-1,179
Other environmental costs	-417
Adjustment for unequal income distribution	-959
Net foreign lending or borrowing	-324
Cost of consumer durables	-896
<b>Benefits ignored by GDP that are added</b>	
Value of housework and parenting	2,079
Value of volunteer work	97
Services of consumer durables	744
Services of highways and streets	96
Net capital investment	476
<b>Genuine Progress Indicator</b>	<b>2,630</b>
Source: Cobb et al., 2001.	

# GPI – Genuine Progress Indicator





# GDP growth x happiness

- assumption of the consumer society -  $\uparrow$  consumption =  $\uparrow$  happiness
- What makes people happy?



# GDP growth x happiness

- assumption of the consumer society -  $\uparrow$  consumption =  $\uparrow$  happiness
- **What makes people happy?**

- GDP per capita in the USA has tripled since 1950, the percentage of the population claiming to be very happy has not increased since the mid-1970s.

- In Japan, the number of happy people has not changed in the last few decades

- In the UK, the percentage of very happy people fell from 52% (1957) to 36% (2006).

## DENMARK

These young men leap from a 16-foot-high diving platform into Copenhagen's harbor. A built environment that invites physical activity helps explain why Danes have among the... [Read More](#)

PHOTOGRAPH BY CORY RICHARDS

| MAGAZINE |

# These Are the World's Happiest Places

What do Denmark, Costa Rica, and Singapore have in common? Their people feel secure, have a sense of purpose, and enjoy lives that minimize stress and maximize joy. Here's how they do it.

BY DAN BUETTNER

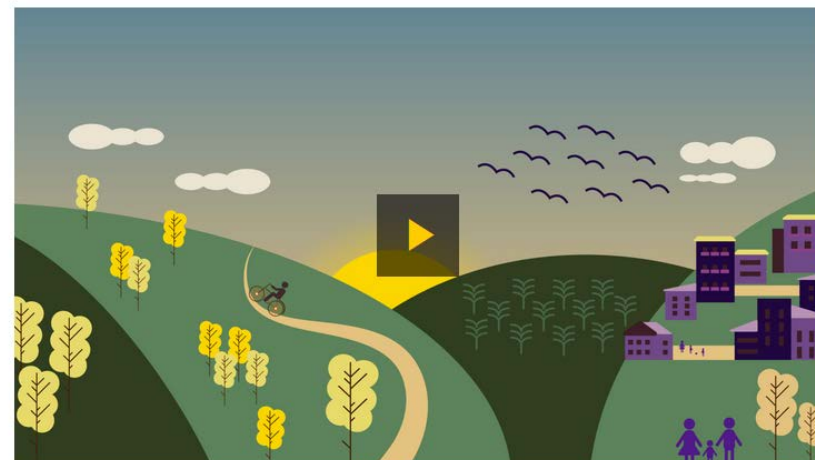
PHOTOGRAPHS BY CORY RICHARDS AND [MATTHIEU PALEY](#)

18 MINUTE READ



This story appears in the [November 2017](#) issue of *National Geographi*

WHO IS THE world's happiest person?



## HOW TO MEASURE HAPPINESS AROUND THE WORLD

Happiness is something that everyone feels in a different way. If you had to measure happiness, what would you do?





# What makes people happy?

# GDP growth x happiness

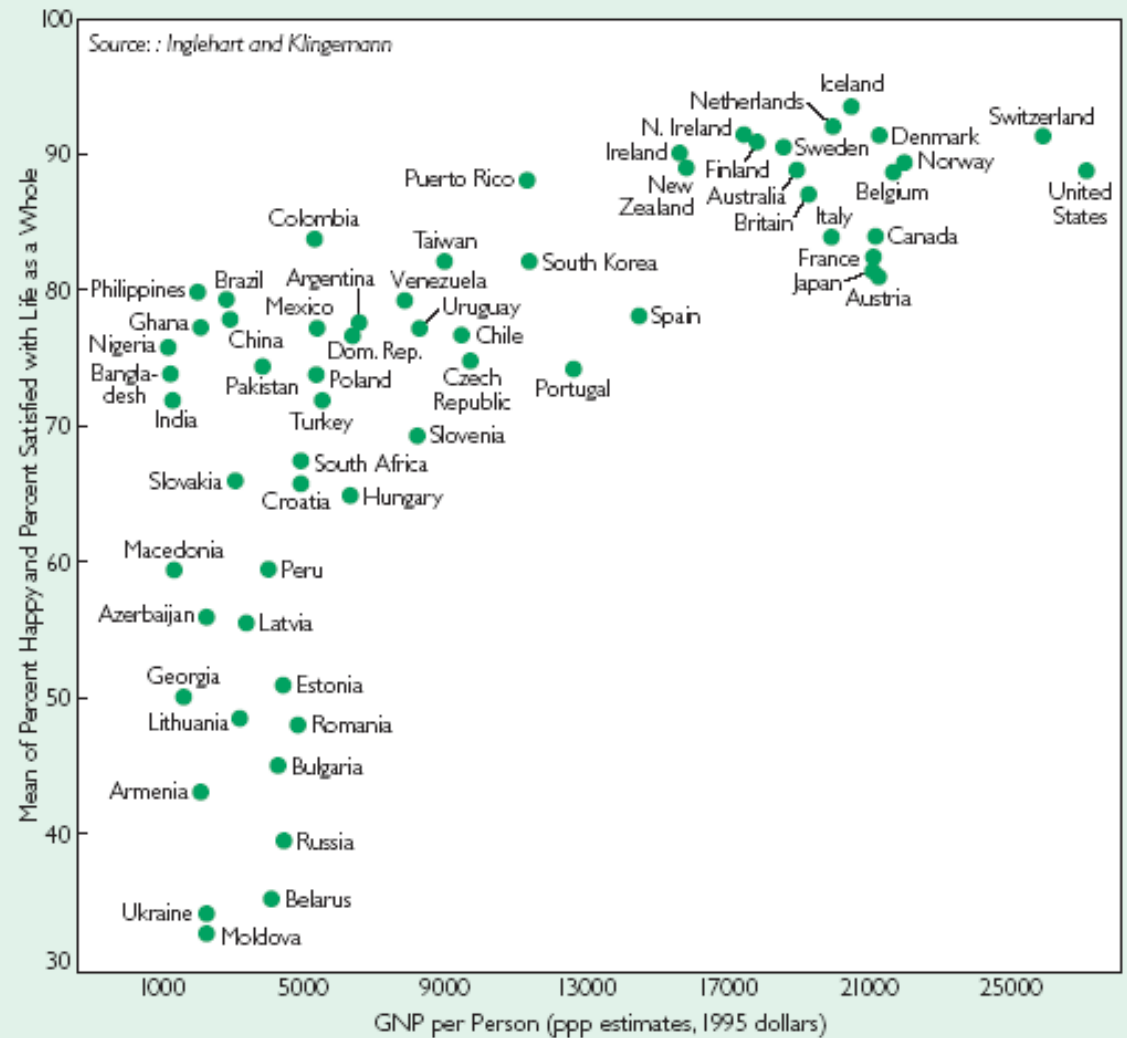
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Figure 4-2. Subjective Well-being and Per Capita Income, 2000



# HDP x HPI (Happy Planet Index)





# Fair Trade

- alternative to conv. international trade
- emphasis on the social and environmental dimension of production and trade





# FAIRTRADE IN THE WORLD

- Fairtrade Producer countries
- Countries where Fairtrade products are sold

SHOPPERS SPENT **€5.5** BILLION ON FAIRTRADE PRODUCTS IN 2013



MORE THAN **1.4** MILLION FARMERS AND WORKERS IN **74** COUNTRIES



OVER **80%** ARE SMALLHOLDERS

**23%** OF FAIRTRADE PRODUCERS ARE WOMEN



OVER **30,000** FAIRTRADE PRODUCTS ON SALE WORLDWIDE



NEARLY **6 IN 10** CONSUMERS HAVE SEEN THE FAIRTRADE MARK. OF THOSE, **9 IN 10** TRUST IT.



\* According to a 2013 GlobalTrust survey carried out in 17 countries

AVERAGE FARM SIZE IS JUST **1.6**

HECTARES FOR FAIRTRADE SMALLHOLDERS



**€86** MILLION ESTIMATED FAIRTRADE PREMIUM PAID IN 2013





# Fair Trade

- alternative to conv. international trade
- emphasis on the social and environmental dimension of production and trade

**Objective:** sustainable development of producers, mainly in the "South" countries - Africa, Latin America and South and South-East Asia

- providing fair business conditions
- about 3,000 Fair Trade shops in Europe
- about 70% are food (mostly coffee, cocoa, bananas, tea), 30% handicrafts
- Fair Trade coffee - 2-3% of the European coffee market
- largest market share - 50% of bananas in Switzerland
- total retail sales turnover 6 billion euros (2014)



**ALL BANANAS ARE NOT  
CREATED  
EQUAL**  
WHY THIS IS A BETTER BANANA

Fair Trade standards support environmentally-friendly farming practices.

Growers are ensured a fair and stable price.

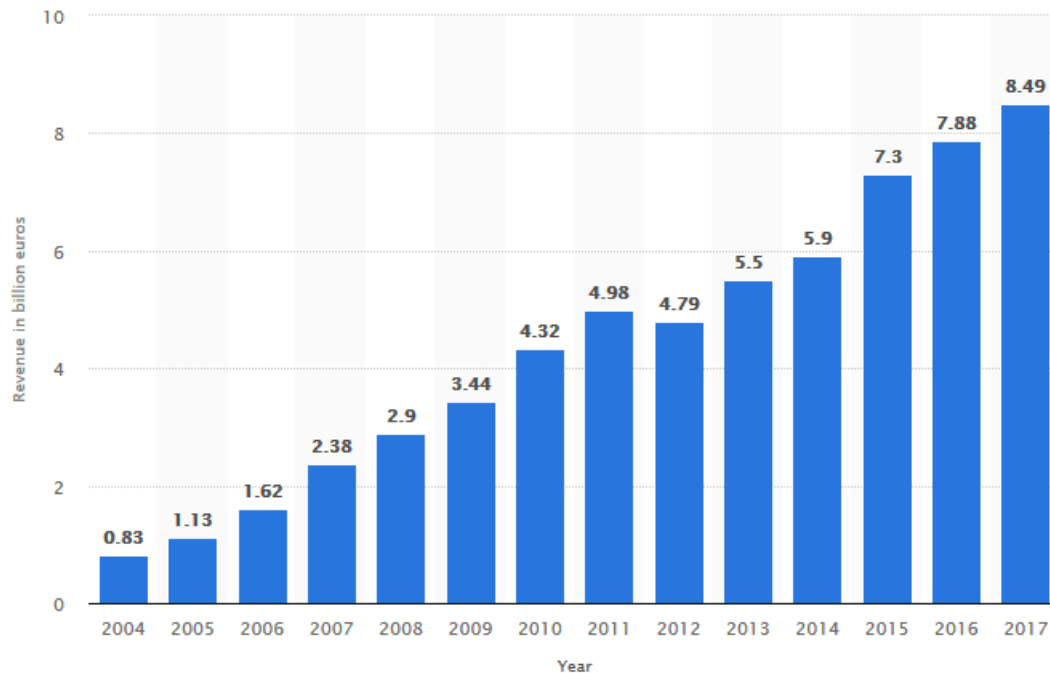


**STABILITY  
SUSTAINABILITY  
COMMUNITY**





Farmer-owned cooperatives invest in community health programs and build roads and schools.

Retail & Trade > Food & Beverage > Revenue of Fairtrade International products worldwide 2004-2017

# Revenue of Fairtrade International products worldwide from 2004 to 2017 (in billion euros)\*



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 PNG +   
  PDF +   
  XLS +   
  PPT +

DESCRIPTION    SOURCE    MORE INFORMATION

This statistic shows the revenue of Fairtrade International products worldwide from 2004 to 2017. In 2017, the revenue generated from Fairtrade International products worldwide amounted to about 8.5 billion euros. When it comes to sustainable development, trade can be the best of servants, but the worst of masters. This is why Fairtrade works within the market, to change the market. Since its beginning, Fairtrade has grown to represent over 1.65 million of these farmers and workers, most recently embracing those who work in the tough conditions of artisanal mining. [Producers](#) now co-own the Fairtrade system, shaping global strategy and running

[About this statistic](#)

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# Fair trade - principles

## It offers to the manufacturers:

- adequate and stable prices for products
- possibility of pre-financing (up to 50% of the order)
- interest-free or low-interest investment loans
- long-term business partnership and supply security
- investments from the common fund in local infrastructure, social development and environmental protection projects - consulting (marketing, management, organic farming, etc.)

## It offers to the employees

- social security and working conditions in accordance with the ILO

## It offers to consumers

- quality products (organic?) at a reasonable price
- a guarantee of the origin of goods
- a choice





# Fair trade – reality

- certification costs (repeated) high - not everyone can pay for it
- repeated personal checks by Commissioners
- sometimes guaranteed too low purchase prices (x quality)
- however, **certainty of guaranteed prices and consumption, and a feeling of self-sufficiency, very important, so farmers are mostly satisfied with FT**

