



**Δρ. Χάρης Δημητριάδης**

## Sustainable, sustainability...

- Sustainable, sustainability, sustained...
- In 18th and 19th century forestry and fishery
  - sustainable yield
  - learning to live off the *interest* of the available natural capital, not of the capital itself
  - resource is not exhausted and its use can continue (can be sustained) indefinitely



## Sustainable, sustainability

Physical sustainability	→ Durable
Operational sustainability	→ Reliable, efficient, acceptable
Overall sustainability	→ Rational, preferable

## Historical background

- In the end of 1960s birth of *environmentalism*
- Not a totally new phenomenon
  - local environmental problems, e.g. water pollution
  - conservation of nature, wilderness (national parks and conservation areas have been set up all over the world since the beginning of 19th century)
- Environmentalism was a more holistic approach
  - environmental problems were no longer perceived as separate controllable/manageable issues
  - it was seen that there was a total crisis between society and environment
  - fears that the conditions for human existence were being jeopardised

## Wake-up calls

- Rachel Carson (1962): *Silent Spring*
  - chemicalization of environment, particularly use of pesticides in agriculture
  - humans are part of the food chain
  - also exposed to pesticides and other chemicals in environment
- The Club of Rome (1972): *The Limits to Growth*
  - population growth, exploitation of natural resources
  - warning of reaching limits → collapse of society
- Nuclear weapons
  - fear of radioactive pollution



## Wake-up call: Torrey Canyon 1967



Source: <http://toxipedia.org/display/toxipedia/Torrey+Canyon>



Source: [http://news.bbc.co.uk/onthisday/hi/dates/stories/march/18/newsid\\_4242000/4242709.stm](http://news.bbc.co.uk/onthisday/hi/dates/stories/march/18/newsid_4242000/4242709.stm)



estimated 25–36 million gallons (94–164 million litres) of crude oil

## Wake-up call: Torrey Canyon 1967



Source: <http://toxicpedia.org/display/toxicpedia/Torrey+Canyon>



Source: [http://news.bbc.co.uk/onthisday/hi/dates/stories/march/18/newsid\\_4242000/4242709.stm](http://news.bbc.co.uk/onthisday/hi/dates/stories/march/18/newsid_4242000/4242709.stm)



Attempts to mitigate the damage included the bombing of the wreck by aircraft from the Royal Navy and Royal Air Force, causing a potential international incident, as the ship was not British, and was in international waters. Hundreds of miles of coastline in Britain, France, Guernsey, and Spain were affected by the oil and other substances used in an effort to mitigate damage.

Around 15,000 sea birds were killed, along with huge numbers of marine organisms, before the 270 square miles (700 km<sup>2</sup>) slick dispersed

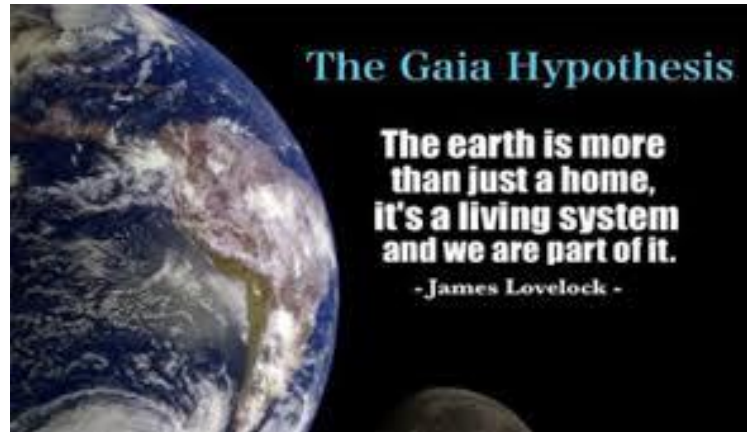
## **GAI**A-hypothesis

- Formulated by James Lovelock in the 1960s
- all organisms and their inorganic surroundings on Earth are closely integrated to form a single and self-regulating complex system, maintaining the conditions for life on the planet
  - temperature
  - chemical composition
- “Living earth”



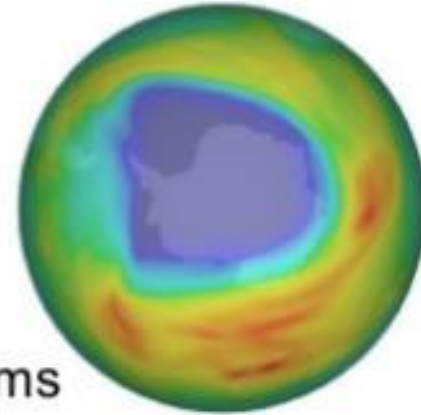


Η θεωρία της Γαίας ανήκει μια κατηγορία επιστημονικών μοντέλων της γεωβιόσφαιρας σύμφωνα με τα οποία η ζωή υποθάλπει και διατηρεί τις κατάλληλες συνθήκες για τον εαυτό της βοηθώντας στη δημιουργία ενός περιβάλλοντος στην Γη κατάλληλου για την διατήρηση και τη συνέχεια της.



Η βιόσφαιρα της Γης δρα ουσιαστικά σαν να είναι ένα αυτοοργανούμενο σύστημα, που λειτουργεί κατά τρόπο ώστε να διατηρεί τα υποσυστήματά του σε κάποιο είδος (δυναμικής) μετα-ισορροπίας που είναι ευρέως δεκτική για τη ζωή. Η ιστορία της εξέλιξης, της οικολογίας και του κλίματος δείχνουν ωστόσο ότι τα ακριβή χαρακτηριστικά αυτής της ισορροπίας έχουν κατά διαστήματα υποστεί γοργές μεταβολές, που πιστεύεται ότι έχουν οδηγήσει είδη σε εξαφάνιση και καταστρέψει πολιτισμούς

## Global environmental problems



- In the 1980s **global** environmental problems
- Ozone depletion (*hole*)
  - first research results presented in the 1970s (Sherwood Roland and Mario Molina)
  - in 1985 the ozone hole above Antarctica was discovered  
→ issue taken seriously
  - 1987 Montreal Protocol to limit the use of CFCs
- Climate change
  - long periods of warm weather and drought

## Industrial society

- Industrial society as **Future** (1800-1920)
  - promises, expectations, fears
- Industrial society as **Wealth** (1920-1975)
  - unquestionable belief for everlasting growth
  - subordination of nature and the resources was legitimated by industrialization as the right course of the history
  - industrial society became as a standard of social and national development

## Questioning development

- In the 1960s and 1970s development discourse was questioned
  - environmental problems
  - problems in developing countries: poverty, famine, wars
- 1973 oil crisis → everlasting growth not possible?
- Industrial society as **Crisis** 1975-



## History of “sustainable development”

- Assembly of the World Council of Churches (1975) sustainable development → three dimensions: cultural, social and environmental economics
- The International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF) and United Nations Environment Programme (UNEP) 1980: *World Conservation Strategy – Living Resource Conservation for Sustainable Development*



## ***The World Commission on Environment and Development***



Source:  
[http://upload.wikimedia.org/wikipedia/commons/e/e9/Gro\\_Harlem\\_Brundtland\\_2009.jpg](http://upload.wikimedia.org/wikipedia/commons/e/e9/Gro_Harlem_Brundtland_2009.jpg)

- In 1983 the General Assembly of the United Nations set the *World Commission on Environment and Development* (“ the Brundtland Commission”)
  - to create a global agenda for change
  - to propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond
- Led by Gro Harlem Brundtland



## ***Our Common Future***

- Report of the Commission *Our Common Future* was published in 1987
- Combined environment and development
- *“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”*

*“It contains within it two key concepts:*

- *the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and*
- *the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.”*



## Milestones of international politics on sustainable development

- The UN Conference on Environment and Development (Earth Summit) in Rio de Janeiro, 1992
  - based on *Our Common Future*
  - the idea of sustainable development was acknowledged on a high political level for the first time
  - Rio declaration and Agenda 21
- The World Summit on Sustainable Development, Johannesburg 2002
  - Rio + 10 → follow-up on Agenda 21
  - Declaration and Plan of implementation
  - emphasis on the three dimensions of sustainable development



## United Nations Conference on Sustainable Development 2012, Rio de Janeiro



**RIO+20**  
United Nations  
Conference on  
Sustainable  
Development

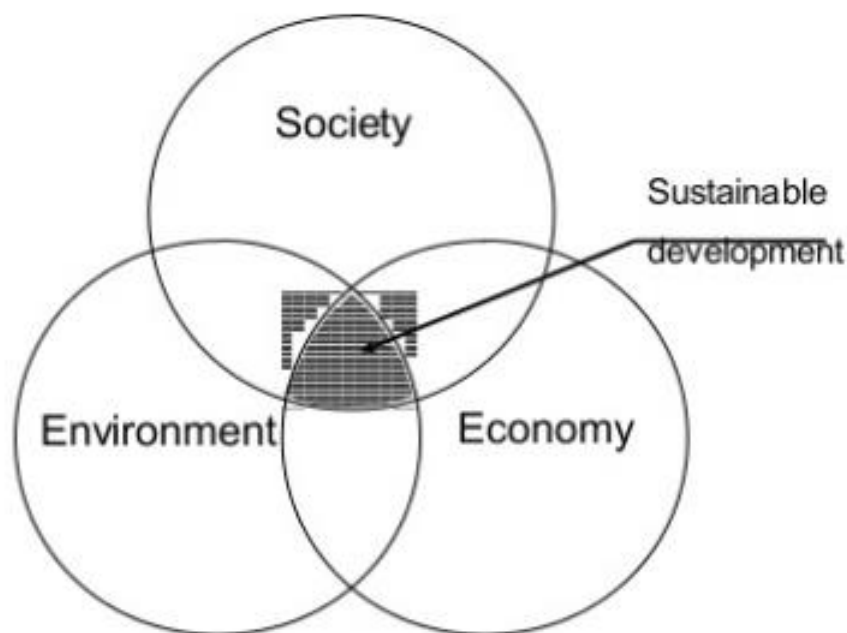
<http://www.uncsd2012.org/rio20/>

<http://www.bbc.co.uk/news/science-environment-18566734>

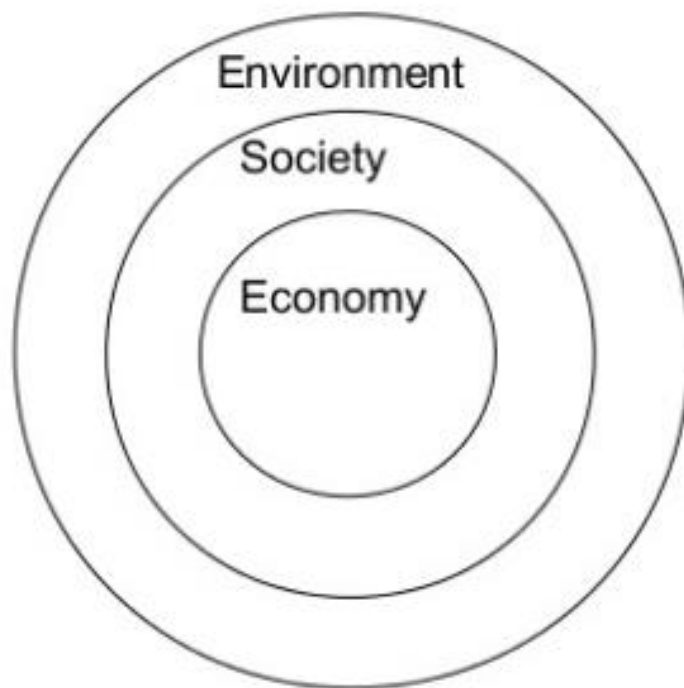
- Rio + 20
- 20.–22.6.2012
- Main themes:
  - green economy in the context of sustainable development and poverty eradication
  - the institutional framework for sustainable development
- End result: New declaration (*The Future We Want*), but no binding agreements or commitments

## **Different perspectives on sustainable development**

## The traditional representation?



## Another representation...



Jurola &  
Karppinen  
2003; Sterling  
2001

## **Finnish interpretation of the three dimensions**

([www.environment.fi/sustainabledevelopment](http://www.environment.fi/sustainabledevelopment))

- Ecological sustainability
  - functioning ecosystems and biodiversity form the basis of human well-being in the long-run
  - carrying capacity
  - cautionary principle
- Social and cultural sustainability
  - guaranteeing prerequisites of well-being also for future generations
  - challenges: population growth, poverty, food security, health care, inequality, lack of education...
- Economic sustainability
  - balanced growth not based on debt or depletion of resources

## Strong vs. weak sustainability

- Strong sustainability: emphasis on environment and social justice. Utilisation of natural resources is necessary but economic growth should not be of intrinsic value
- Weak sustainability: Nature is seen merely as a “resource base” for human beings. Markets are seen to guide development in best possible (most sustainable) way.
- Compare Econcentrism (biocentrism) vs. anthropocentrism

## **Sustainable development from the point of view of capital**

- Human capital (e.g. competencies, science, research...)
- Physical capital (e.g. machinery, infrastructure, buildings...)
- Social capital (e.g. institutions, legislation, governance, social networks, trust...)
- Natural capital (e.g. ecosystem services, renewable and non-renewable natural resources, biodiversity...)
- Are different forms of capital interchangeable? Weak vs. Strong interpretation?



# Gracias!

**Charalampos Dimitriadis**  
**[xdimitriadis@marine.aegean.gr](mailto:xdimitriadis@marine.aegean.gr)**