Rethinking human security in the Anthropocene - the age of man
Definition

- **Anthropocene**: is an informal geologic chronological term that serves to mark the evidence and extent of human activities that have had a significant global impact on the Earth's ecosystems.

Paul Creutzen
Geological time spiral - Holocene

Source: www.cr.nps.gov
Earth system science

• Earth system science provides a physical basis for understanding the world in which we live and upon which humankind seeks to achieve sustainability.

• The Earth system science was inspired by Gaia theory, that proposes that organisms interact with their inorganic surroundings on Earth to form a self-regulating, complex system that contributes to maintaining the conditions for life on the planet.
Human pressure on environment

- **Environment**: the complex of physical, chemical, and biotic factors (as climate, soil, and living things) that act upon an organism or an ecological community and ultimately determine its form and survival.

- Humankind joined with the other environmental forces in shaping the planet.
The new epoch

• The Anthropocene could be said to have started in the late eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane.

• Crutzen proposed the Industrial Revolution as the start of Anthropocene.
Biosphere of Anthropocene

Source: J. Aronson et al. 2006. natural capital - the limiting factor.pdf
Planet under pressure

- **Human pressure** on the planet is reaching a saturation point which, if exceeded, may undermine social and economic development.

- The main reasons for the growth human pressure on the planet earth is **population growth** – there are already more than six billion of us, and on present trends the UN says we shall probably number about 8.9 billion by 2050. The UN also forecasts that today's urban population of 3.2 billion will rise to nearly 5 billion by 2030, when three out of five people will live in cities.
Growth in Megacities

*Cities containing more than 10 million inhabitants.

Source: National Geographic Society and United Nations
Planet under pressure

- Population growth means something else, too: urban growth although the proportion of people living in poverty is continuing to fall, the absolute number goes on rising, because fecundity outstrips our efforts to improve their lives. Poverty matters because it leaves many people no choice but to exploit the environment, and it fuels frustration.

Six areas where the risk is the largest for our planet:

- **Food**: An estimated 1 in 6 people suffer from hunger and malnutrition while attempts to grow food are damaging swathes of productive land.
- **Water**: By 2025, two-thirds of the world’s people are likely to be living in areas of acute water stress.
- **Energy**: Oil production could peak and supplies start to decline by 2010.
- **Climate change**: The world’s greatest environmental challenge, according to the UK prime minister Tony Blair, with increased storms, floods, drought and species losses predicted.
- **Biodiversity**: Many scientists think the Earth is now entering its sixth great extinction phase.
- **Pollution**: Hazardous chemicals are now found in the bodies of all new-born babies, and an estimated one in four people worldwide are exposed to unhealthy concentrations of air pollutants.

All six problems are linked and urgent.
Light pollution

Source: http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightpollution/abstract.asp
CO2 emission (per capita)

Growth of CO2 emission causes global and continental temperature change.

Changes in biodiversity

The Living Planet Index is an indicator of the state of the world's biodiversity: it measures trends in populations of vertebrate species living in terrestrial, freshwater, and marine ecosystems.

Source: WWF, UNEP-WCMC
What can we do to reduce the Earth damage caused by human kind?

The path to solutions:

• Agreements between countries
  (CITES, BERN Convention, Kyoto Protocol, CBD, Rio + 20…)

• Alternatives energies (renewables resources)
  New Technologies

• Environmental protection
  (Rio + 20, Recycling, Afforestation, Sustainable Development)
Kyoto Protocol

- The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.

- Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

RIO +20

- The United Nations Conference on Sustainable Development (UNCSD), also known as Rio 2012, Rio+20 (Portuguese pronunciation, or Earth Summit 2012 was the third international conference on sustainable development aimed at reconciling the economic and environmental goals of the global community. Hosted by Brazil in Rio de Janeiro from 13 to 22 June 2012, Rio+20 was a 20-year follow-up to the 1992 Earth Summit / United Nations Conference on Environment and Development (UNCED) held in the same city.

Sources: [http://unfccc.int/kyoto_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)  
Alternatives Energies:

- It's a term used for energy sources that is an alternative to using fossil fuels. Generally, it indicates energies that are non-traditional and have low environmental impact. The term alternative is used to contrast with fossil fuels according to some sources. By most definitions alternatives energy doesn’t harm the environment, a distinction which separates from renewable energy which may or may not have significant environmental impact.

The 6 primary types of Renewable Energy:

I. Wind
II. Solar
III. Biomass
IV. Geothermal
V. Hydro Power
VI. Biofuels

Sources: [http://extension.psu.edu/natural-resources/energy/about/terms](http://extension.psu.edu/natural-resources/energy/about/terms)
o The ultimate goal is to reduce the human modification of the global environment to avoid dangerous or difficult to control levels and rates of change, and ultimately to allow the Earth Systems to function in a pre Anthropocene way.

o There are further technological opportunities. Worldwide energy use is equivalent to only 0.05% of the solar radiation reaching the continents, for example.

o Although improved technology is essential for mitigating global change, it may not be enough on its own. Changes in societal values and individual behaviour will likely be necessary.

Sources: The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature
Will Steffen; Paul J Crutzen; John R McNeill
Ambio; Dec 2007: 36,8: Sciences Module
Thanks for the attention!

Source: www.absolutebodo.com
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