



Keeping Up with a Moving Target Environmental Terminology

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Martina Burkert, CT English > German
German Life Science Translation

www.lifescitrans.com

mburkert@lifescitrans.com

INTRODUCTION

Martina Burkert

English to German Translator / ATA certified for EN>GER

BACKGROUND

- Formal education in Agricultural and Environmental Sciences, equivalent to MS from Justus Liebig University Gießen, Germany
- Worked in Waste Management Department of German County as evaluator for environmental risks of abandoned waste deposit sites
- Agricultural Consultant and Orchard Manager in California, USA
- Full time Translator since 1998
- Co-Manager of small organic orchard certified by CCOF (California Certified Organic Farmers)

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Session Overview

History of Environmental Awareness

Disciplines within Environmental Science

Glossaries

What needs protection?

- Biomes and Natural Ecosystems
- Natural Resources
- Climate

Session Overview cont.

Human activity

- Use of Natural Resources
- Emissions and Waste
- Agriculture, Forestry, Fishing, Hunting
- Energy Production
- Industry and Transport

History of Environmental Awareness

- Deforestation in the Mediterranean during Phoenician, Greek and Roman times
- Smog (smoke and fog) incidents, mostly caused by coal burning, documented as early as 1306 in London
- 1943 sudden smog in Los Angeles; 1948 major incident in Pennsylvania; 1952 Great Smog of London (killed 4,000 Londoners); 1966 New York City (at least 169 dead)
- After World War II: Concern about radiation from nuclear energy
- 1960's increasing awareness of toxicity of chemicals like agricultural synthetic pesticides (e.g. DDT) and PCBs (polychlorinated biphenyls) which are extremely persistent in the environment. In the US manufacturing of PCBs was banned in 1979
- 1960's to 1970's first major oil incidents, acid rain widely observed and studied, dead zones in oceans and lakes
- 1970's to 1980's incidents in chemical plants: dioxin (TCDD) release in Seveso, Italy 1976; release of methyl isocyanate in Bhopal, India 1984
- Nuclear incidents: Three Mile Island near nuclear disaster in Harrisburg, Pennsylvania 1979; Chernobyl, 1986

Over time regulations to protect the environment and human health were introduced worldwide.

Example: Wikipedia's [Timeline of major U.S. environmental and occupational health regulation](#) outlines a developing focus from more to less obvious issues and from local to global concerns:

- Air, water, waste
- Occupational safety, toxic substances, transport
- Hazardous waste, chemical and oil spills
- Pesticides
- Drinking water
- Conservation of resources, land and wildlife
- Ozone depletion, greenhouse gases, climate change



Significant improvements have been made

Problems persist in some parts of the world

New sets of problems are emerging

- April 2010: Deepwater Horizon oil spill in the Gulf of Mexico
- March 2011: Fukushima nuclear accidents in Japan
- October 2012: Hurricane Sandy caused a ConEdison power plant to explode
- April 2013: Fertilizer plant explosion in West, Texas; at least 14 people were killed
- July 2013: Lac-Mégantic, Quebec Canada. Derailment of an oil shipment train
- September 2016: Gazipur, Bangladesh. Boiler explosion in a packaging industry led to the death of 23 workers
- November 2016 Great Smog of Delhi
- March 2017 in Addis Ababa, Ethiopia. Landfill collapse killed more than 100 people
- Smog pollution is still a regular problem in Southeast Asia
- Smog incidents frequent in Beijing

Challenges attributed to climate change

- Increasing damage from extreme weather events
- More wildfires
- Droughts more common
- Sea level rise
- Shifts in agricultural production
- More stress on aging environmental infrastructure, e.g.
 - Flood control
 - Dams
 - Slope reinforcements

Disciplines within Environmental Science

- ecology, biology, zoology
- microbiology, biotechnology
- chemistry
- soil science, mineralogy
- oceanology, limnology
- geology, earth science
- atmospheric science
- anthropology, sociology
- economics, business
- technology, engineering
- legislation, regulations
- others

Glossaries and Sources

US EPA - U.S. Environmental Protection Agency

<https://19january2017snapshot.epa.gov/> or

<https://www.epa.gov/> current site, doesn't include information about climate change

- Glossary (English): https://19january2017snapshot.epa.gov/environmental-topics/z-index_.html or <https://www.epa.gov/environmental-topics/z-index>

EEA – European Environment Agency

<https://www.eea.europa.eu/>

- Glossary (English) with definitions from several sources, documents search https://www.eea.europa.eu/help/glossary#co=all&c4=10&b_start=o

Part of EEA:

Eionet - European Environment Information and Observation Network
with

- GEMET - GEneral Multilingual Environmental Thesaurus (up to 39 languages)
<http://www.eionet.europa.eu/gemet/en/themes/>

short definition, translation of term into up to 39 languages, related terms links to other glossaries etc.

Glossaries and Sources cont.

OECD (Organisation for Economic Co-operation and Development)

- Glossary of statistical terms with definition and related terms, very informative (English)

<https://stats.oecd.org/glossary/index.htm>

EuroVoc

- Multilingual Thesaurus of the European Union (23 European languages: (Bulgarian, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish and Swedish), plus in three languages of countries which are candidate for EU accession: македонски (mk), shqip (sq) and српски (sr)); translation of terms, related concepts, links to other glossaries

<http://eurovoc.europa.eu/drupal/>

UNBIS (United Nations Bibliographic Information System)

- Thesaurus in the official languages of the United Nations: Arabic, Chinese, English, French, Russian and Spanish; translation of terms, related terms

[https://lib-thesaurus.un.org/LIB/DHLUNBISThesaurus.nsf/\\$\\$searche?OpenForm](https://lib-thesaurus.un.org/LIB/DHLUNBISThesaurus.nsf/$$searche?OpenForm)

Glossaries and Sources cont.

FAO (Food and Agriculture Organization)

- AgroVoc covering all areas of interest of the FAO of the United Nations – (23 languages: Arabic, Chinese, Czech, English, French, German, Hindi, Hungarian, Italian, Japanese, Korean, Lao, Malay, Persian, Polish, Portuguese, Russian, Slovak, Spanish, Telugu, Thai, Turkish and Ukrainian); not always reliable

<http://artemide.art.uniroma2.it:8081/agrovoc/agrovoc/en/>

UNFCCC (United Nations Framework Convention on Climate Change)

- Glossary of climate change acronyms and terms; documents search (English)

http://unfccc.int/essential_background/glossary/items/3666.php#C

USDA – U.S. Department for Agriculture

- Glossary of agricultural terms (English and Spanish)

https://agclass.nal.usda.gov/glossary_az.shtml

ZBW - Leibniz Information Centre for Economics

- STW Thesaurus for Economics - Natural sciences and technology (German and English)

<http://zbw.eu/stw/versions/latest/thsys/70151/about.en.html#>

Wikipedia – reliable articles, links to corresponding pages in other languages in left side menu

What needs protection?

- Biomes and Natural Ecosystems
- Natural Resources
- Climate



What needs protection?

Biomes and Natural Ecosystems

Definitions

- A biome is a major portion of the living environment of a particular region (such as a coniferous forest or grassland), characterized by its distinctive vegetation and maintained by local climatic conditions. (Source: EEA glossary; GBA)
- An ecosystem is a dynamic complex of plant, animal, and micro-organism communities and the non-living environment interacting as a functional unit. (Source: EEA glossary; Millennium Ecosystem Assessment, 2005)
- An ecosystem is a system in which the interaction between different organisms and their environment generates a cyclic interchange of materials and energy. (Source: OECD glossary)



Biomes and Natural Ecosystems

Biome types

- Aquatic
 - Freshwater
 - Marine
- Terrestrial
 - Forrest
 - Grassland
 - Desert
 - Tundra

Ecosystems are driven by solar energy and form an integrated, functioning whole. They interact with other ecosystems.

Ecosystems consist of:

- Producers (green plants)
- Consumers (herbivores and carnivores)
- Decomposers (fungi and bacteria)
- Nonliving, or abiotic, component (dead organic matter and nutrients in the soil and water)

Biomes and Natural Ecosystems

Threats to Biomes and Ecosystems

- Degradation. Damaged ecosystems cannot be easily reestablished. Some, like wetlands, are especially vulnerable.
- Destruction, e.g. deforestation
- Loss of species and habitats
- Invasive species
- Overfishing
- Chemical and oil spills
- Ocean plastics pollution
- Other threats



Biomes and Natural Ecosystems

Related Terms

- Ecology
- Ecosphere
- Biosphere
- Man-made ecosystem
- Biodiversity
- Habitat
- Wildlife conservation
- Endangered species
- Invasive species
- Genetic pollution

Further Reading

- US EPA, Toolbox for Ecological Risk Assessors <https://www.epa.gov/ecobox>
- Biodiversity Information System for Europe <http://biodiversity.europa.eu/>
- WorldBiomes.com <http://www.worldbiomes.com/>
- Websites of Non-Governmental Organizations



What needs protection?

Natural Resources

Definitions

- Resources that exist without actions of humankind. This includes all valued characteristics such as magnetic, gravitational, and electrical properties and forces. On earth it includes: sunlight, atmosphere, water, land, including soil and minerals, along with vegetation, crops and animal life. (Source: Wikipedia, modified)
- A feature or component of the natural environment that is of value in serving human needs, e.g. soil, water, plantlife, wildlife, etc. Some natural resources have an economic value (e.g. timber) while others have a "noneconomic" value (e.g. scenic beauty). (Source: EEA glossary; UNUN)

Natural Resources

- Biotic - Living material (plants, animals, microorganisms etc.) and organic material including fossil fuels (decayed organic matter)
- Abiotic - Non-living, non-organic material, e.g. land, water, air, minerals etc.

- Renewable - Resources capable of being continuously renewed or replaced through such processes as organic reproduction and cultivation such as those practiced in agriculture, animal husbandry, forestry, and fisheries. (Source: EEA glossary; LANDY)
- Non-renewable - A natural resource which, in terms of human time scales, is contained within the Earth in a fixed quantity and therefore can be used once only in the foreseeable future (although it may be recycled after its first use). This includes the fossil fuels and is extended to include mineral resources and sometimes ground water, although water and many minerals are renewed eventually. (Source: EEA glossary; ALL)
- Perpetual - Resources not noticeably affected by human consumption, like sunlight, air, wind, geothermal energy
- Conditionally renewable - Resources whose exploitation eventually reaches a level beyond which regeneration will become impossible. Such is the case with the clear-cutting of tropical forests. (Source: OECD Glossary)



Natural Resources

Special Case: Water

(Source: OECD Glossary)

- **TOTAL NATURAL RENEWABLE WATER** - The sum of the average annual flow of rivers and recharge of ground water generated from endogenous precipitation and the natural flow originating outside the country.
- **TOTAL ACTUAL RENEWABLE WATER RESOURCES** -The sum of the internal renewable water resources and natural incoming flow originating outside the country, taking into account the quantity of flow reserved to upstream and downstream countries through formal or informal agreements.
- **TOTAL NON-RENEWABLE WATER** - The volume of water which is not renewable by endogenous processes during the hydrological cycle. It includes fossil groundwater generated in geological times as well as a large part of water in lakes whose replenishment rate is very small.

Natural Resources

Special Case: Soil

- It takes 500 to thousands of years to form 1 inch of top soil
- Soil degradation due to
 - Erosion
 - Salinization
 - Compaction
 - Acidification
 - Chemical pollution
 - Soil sealing*
- 33 percent of land is moderately to highly degraded



Source: The Status of the World's Soil Resources produced by FAO's Intergovernmental Technical Panel on Soils 2015

**not mentioned by FAO, major concern in the EU*

What needs protection?

Climate

Key Words

- Climate Change
- Global Warming
- Greenhouse Gases

Definitions for Climate:

- The mean physical state of the atmosphere as reflected in weather behaviour over a period of years. (Source UNBIS)
- The average weather condition in a region of the world. Many aspects of the Earth's geography affect the climate. Equatorial, or low, latitudes are hotter than the polar latitudes because of the angle at which the rays of sunlight arrive at the Earth's surface. The difference in temperature at the equator and at the poles has an influence on the global circulation of huge masses of air. Cool air at the poles sinks and spreads along the surface of the Earth towards the equator. Cool air forces its way under the lower density warmer air in the lower regions, pushing the lighter air up and toward the poles, where it will cool and descend. (Source: EEA Glossary; WRIGHT)

Climate

Climate Change – Global Warming – Greenhouse Gases

Definitions

- Climate Change

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), which defines 'climate change' as: 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.' (Source: EEA glossary, EEA)

- Global Warming

An increase in temperature near the surface of the Earth. Global warming has occurred in the distant past as the result of natural causes. However, the term is most often used to refer to recent and ongoing warming caused by people's activities. Global warming leads to a bigger set of changes referred to as global climate change. (Source: EPA)

- Greenhouse Gases

A collective expression for those components of the atmosphere that influence the greenhouse effect, namely carbon dioxide, methane, nitrous oxides, ozone, chlorofluorocarbons and water vapour. (Source: GILPg6)

Climate Global Warming

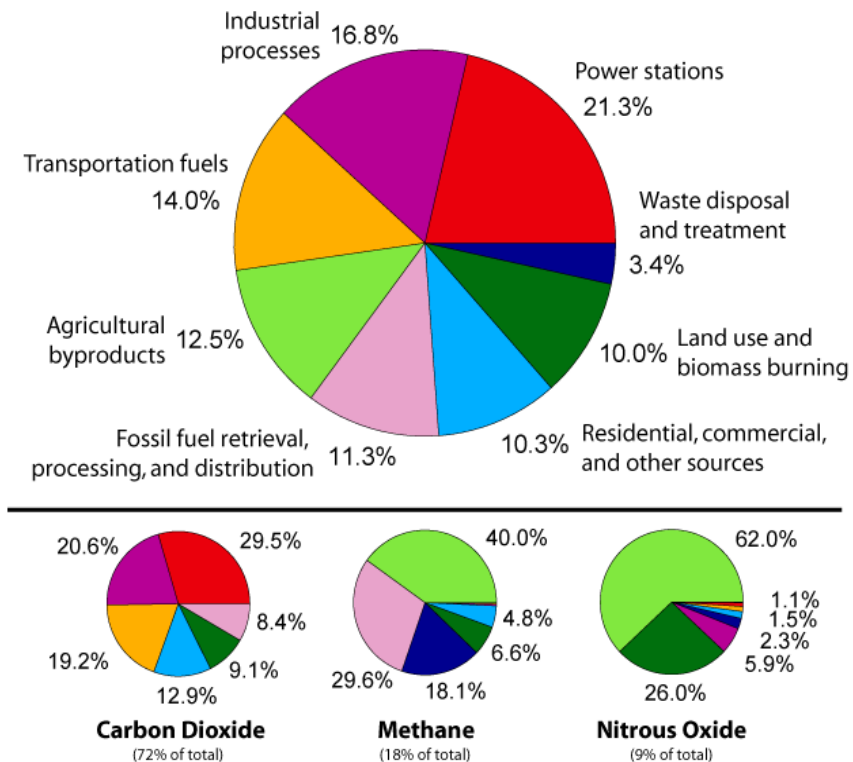
- Energy from the sun reaches the earth's surface.
- Some of the energy that is absorbed by the earth's surface turns into long-wave infrared radiation (heat energy).
- Heat energy is released back into the atmosphere.
- Greenhouse gases absorb this infrared heat and radiate some of it back to earth.
- The earth's surface is further warmed.
- Urbanization, deforestation and soil degradation influence the heat exchange between the earth's surface and the atmosphere.



Climate Greenhouse Gases

Estimation by the Emission Database for Global
Atmospheric Research, 2000

Annual Greenhouse Gas Emissions by Sector



By Robert A. Rohde (Own work) [GFDL
(<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0
(<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia
Commons

Sources of Greenhouse Gases

- Power stations
- Industrial processes
- Transportation fuels
- Agricultural byproducts
- Fossil fuel retrieval, processing, and distribution
- Residential, commercial and other sources
- Land use and biomass burning
- Waste disposal and treatment

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Martina Burkert, CT (EN>GER)
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Climate

Climate Change – Global Warming – Greenhouse Gases

Related Terms

- Solar activity
- Climate models
- Weather extremes
- CO₂ footprint
- Carbon sequestration
- Permafrost instability, glacial retreat
- Ocean chemistry

Further Reading

United Nations Framework Convention on Climate Change <http://unfccc.int/2860.php>

NASA Global Climate Change
<https://climate.nasa.gov/evidence/>

EEA Climate change impacts and adaptation
<https://www.eea.europa.eu/soer-2015/europe/>

Challenges attributed to climate change

- Increasing damage from extreme weather events
- More wildfires
- Droughts more common
- Sea level rise
- Shifts in agricultural production
- More stress on aging environmental infrastructure
 - Flood control
 - Dams
 - Slope reinforcements

Human activity

- Use of Natural Resources
- Emissions and Waste
- Agriculture, Forestry, Fishing, Hunting
- Energy Production
- Industry and Transport



Human Activity

Natural Resources

Biotic

Abiotic

Renewable

Non-renewable

Perpetual

Conditionally renewable



Human Activity

Emissions and Waste

Definitions

- **Emission:** A discharge of pollutants into the environment, partially or completely treated or in its natural state. Generally used in regard to discharges into the air. (Source: EPA)
- **Emission:** A discharge of particulate gaseous, or soluble waste material/pollution into the air from a polluting source. (Source: EEA Glossary; UNUN)
- **Emission:** Direct release of a pollutant to air or water as well as the indirect release by transfer to an off-site waste water treatment plant. (Source: EEA Glossary)
- **Waste:** Materials that are not prime products (that is, products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residuals recycled or reused at the place of generation are excluded. (Source: EEA Glossary)

Emissions and Waste

Emissions

Emissions into Air

- Greenhouse gases (carbon dioxide, methane, nitrous oxides, ozone, CFCs, water vapor)
- Pollutants:
 - Primary pollutants
 - Secondary pollutants (form when other pollutants react in the atmosphere)
 - Particulates (aerosols when mixed with air)
 - Toxic pollutants (e.g. heavy metals, POPs)
 - Carbon monoxide (CO)
- Noise

Emission standards

Legal requirements limiting air pollutants released into the atmosphere from specific sources.

- First air pollution agency in the US was created in 1947 in Los Angeles due to severe air quality problems in that area.
- Vehicle emission standards are set by the EPA. California is permitted to issue their own standards which are stricter than US standards.
- Canada's standards are aligned with US Federal standards.
- European Union and Japan have their own set of standards.
- Other countries like China, India, Hong Kong, Israel, Turkey, Australia base their regulations mostly on European standards.

Emissions and Waste

Waste

Solid Waste

- Municipal Solid Waste
- Industrial Waste
- Hazardous Waste
- Chemical Waste
- Construction Waste
- Automotive Waste
- Recyclable Materials
- Electronic Waste
- Radioactive Waste
- Other Waste



Liquid Waste

- Municipal Wastewater
- Industrial Wastewater
- Process Wastewater
- Used Oil and Oily Water
- Fats, Oils, or Greases
- Organic Liquids
- Hydraulic Fracturing Fluids
- Other Liquids



Human Activity

Agriculture, Forestry, Fishing, Hunting

SUSTAINABILITY

Definitions

- US EPA (U.S. Environmental Protection Agency):
Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations.
- UNFCCC (United Nations Framework Convention on Climate Change):
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- OECD (Organization for Economic Co-operation and Development):
Sustainability refers to:
 - (a) use of the biosphere by present generations while maintaining its potential yield (benefit) for future generations; and/or
 - (b) non-declining trends of economic growth and development that might be impaired by natural resource depletion and environmental degradation.

Agriculture, Forestry, Fishing, Hunting

Hunting



- Regulated for sustainability
- Food, commercial interests
- Recreation
- Wildlife management (regulation of populations)
- Interference with human activity (agricultural damage, safety)


Agriculture, Forestry, Fishing, Hunting

Forestry

- Wood production
- Recreation
- Biodiversity
- Soil conservation
- Water retention
- Counteract global warming



Sustainable forest management addresses forest degradation and deforestation while increasing direct benefits to people and the environment. At the social level, sustainable forest management contributes to livelihoods, income generation and employment. At the environmental level, it contributes to important services such as carbon sequestration and water, soil and biodiversity conservation. (Source: FAO)



Agriculture, Forestry, Fishing, Hunting

Fishing

- Overfishing
- Destructive fishing practices
- Sustainable practices for economical and ecological reasons

Sustainable Catch

Number (weight) of fish in a stock that can be taken by fishing without reducing the stock biomass from year to year, assuming that environmental conditions remain the same. Different levels of sustainable catch exist for different stock sizes. Maximum sustainable catch is defined in reference to the size and composition of a stock that make the natural growth of the stock equal to this maximum. (OECD Glossary)

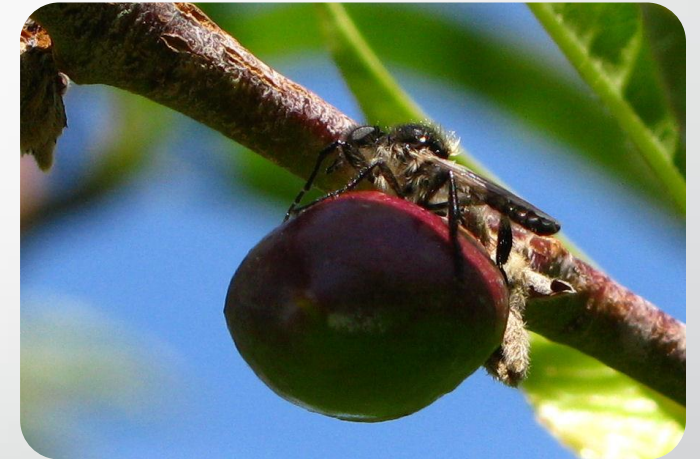
Sustainable Seafood

Seafood that is either caught or farmed in ways that consider the long-term vitality of harvested species and the well-being of the oceans, as well as the livelihoods of fisheries-dependent communities. It was first promoted through the sustainable seafood movement which began in the 1990's. This operation highlights overfishing and environmentally destructive fishing methods. Through a number of initiatives, the movement has increased awareness and raised concerns over the way our seafood is obtained. (Source: Wikipedia)

Agriculture, Forestry, Fishing, Hunting

Agriculture

- Significant increase of agricultural production since after World War II due to
 - Mechanization
 - Use of synthetic fertilizer
 - Use of pesticides and herbicides
 - Irrigation
 - Land development
- Negative effects
 - Soil erosion
 - Water / ground water pollution
 - Damage and health risks caused by pesticides
 - Over-exploitation of water resources
 - Loss of biodiversity
 - Concerns about impact of genetic engineering and antibiotic resistance



Agriculture, Forestry, Fishing, Hunting

Agriculture

Industrial agriculture, characterized by monoculture, intensive crop farming, use of genetically modified crops, intensive animal farming, etc., has significant impacts on the environment and on natural resources.

Some further reading on industrial agriculture:

http://www.newworldencyclopedia.org/entry/Industrial_agriculture#Sustainable_agriculture

<http://www.ucsusa.org/our-work/food-agriculture/our-failing-food-system/industrial-agriculture>

Definitions for sustainable agriculture are often vague

- Agricultural production that is economically viable and does not degrade the environment over the long run. Definitions differ as to the period over which sustainability is intended to be achieved; whether sustainability should relate only to localised effects on the environment or also to effects on the environment caused by the production of farm inputs; and whether the environment in this context should be defined only to include the physical environment (soil, water, plants and animals) or also the environment created by agriculture, such as landscape amenities. (Source: OECD Glossary)
- The desired relationship between agriculture and environment can be captured by the term 'sustainable agriculture'. The 5th environmental action programme refers to sustainable development as 'development, which meets the needs of the present without compromising the ability of future generations to meet their own needs'. Sustainable agriculture entails the management of natural resources in a way, which ensures that the benefits are also available in the future. A broader understanding of sustainability extends to the protection of landscapes, habitats, and biodiversity, and to overall objectives such as the quality of drinking water and air. (Source EEA Glossary)

Agriculture, Forestry, Fishing, Hunting

Agriculture

Concepts to Support Sustainable Farming Practices include

Integrated Pest Management and Organic Farming

- Integrated Pest Control - A systematic, comprehensive approach to pest control that uses the insect's or rodent's own biology and behavior to find the least toxic control methods at the lowest cost. (Source: GEMET)
- Integrated Pest Management: a definition "Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms." (Source: FAO)

Some further reading on IPM:

<https://www.epa.gov/managing-pests-schools/introduction-integrated-pest-management>

<http://www2.ipm.ucanr.edu/WhatIsIPM/>

- Organic Farming - Farming without the use of industrially made fertilizers or pesticides. (Source: GEMET)
- Organic Agriculture: a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, cultural, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system. (Source: FAO)



Agriculture, Forestry, Fishing, Hunting

Agriculture

Organic Certification

- In the US the National Organic Program of the United States Department of Agriculture (USDA) is responsible for developing national standards for organically-produced agricultural products. Farmers are certified by state organizations. <https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program>
- International Trade of organic products is expanding. <https://www.ams.usda.gov/services/organic-certification/international-trade>
 - Products are imported into the US from Canada, European Union, India, Israel, Japan, New Zealand, Korea, Switzerland, Mexico.
 - Products are exported from the US into Canada, European Union, Taiwan, Japan, Korea, Switzerland
- In the EU certification is subject to EU regulations. https://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/organic-certification_en
- Some further reading on organic certification:
 - https://ec.europa.eu/agriculture/organic/index_en (24 European languages)
 - http://www.fao.org/fileadmin/templates/organicag/files/Glossary_on_Organic_Agriculture.pdf (EN, FR, SP)

Agriculture, Forestry, Fishing, Hunting

Agriculture

Related Terms

- Precision farming
- Intensive farming / Extensive farming
- Factory farming
- Conventional agriculture
- Biodynamic agriculture
- Population growth
- World hunger
- Genetically modified organisms (GMO)
- Hormone free / Antibiotic-free
- Food labeling

Further Reading and Resources

- FOOD and Agriculture Organization of the UN <http://www.fao.org/home/en/>
- EEA on Agriculture <https://www.eea.europa.eu/themes/agriculture>
- Environmental Working Group, AgMag <http://www.ewg.org/agmag>
- USDA Glossary of agricultural terms (EN and SP) https://agclass.nal.usda.gov/glossary_az.shtml

What's on the menu?

SUSTAINABLE
SALMON FILET

GRASS FED
BURGER

NON-GMO FED,
GRASS FED FREE
RANGE EGGS

Human Activity

Energy Production

Energy Consumption by Sector

- **Industrial:** Facilities and equipment used for producing and processing goods.
 - Chemical Production, Petroleum Refining, Metal Smelting/Refining
- **Transportation:** Vehicles which transport people/goods on ground, air, or water.
 - Gasoline Fuel, Diesel Fuel, Aviation
- **Residential:** Living quarters for private households.
 - Space Heating, Water Heating, Lighting, Air Conditioning, Refrigeration, Electronics, Wet-clean (mostly clothes dryers)
- **Commercial:** Service-providing facilities and equipment (businesses, government, other institutions).
 - Lighting, Heating, Cooling, Refrigeration, Water Heating, Ventilation, Electronics

Source: Wikipedia



Energy Production

Green Power Partnership – US EPA

The Environmental Protection Agency of the United States of America distinguishes between

- Conventional power
 - Fossil fuels (coal, natural gas, oil)
 - Nuclear fission of uranium
- Renewable energy
 - Large hydropower
 - Municipal solid waste
 - **Green power**
 - Wind, solar, biomass, geothermal, biogas, low-impact hydropower

Energy Production

Green Power Partnership (United States Environmental Protection Agency)

The U.S. energy supply is composed of a wide variety of energy resources; however, not all energy resources have the same environmental benefits and costs.

- **Green power** is a subset of renewable energy and represents those renewable energy resources and technologies that provide the highest environmental benefit. EPA defines green power as electricity produced from solar, wind, geothermal, biogas, eligible biomass, and low-impact small hydroelectric sources. Customers often buy green power for its zero emissions profile and carbon footprint reduction benefits.
- **Renewable energy** includes resources that rely on fuel sources that restore themselves over short periods of time and do not diminish. Such fuel sources include the sun, wind, moving water, organic plant and waste material (eligible biomass), and the earth's heat (geothermal). Although the impacts are small, some renewable energy technologies can have an impact on the environment. For example, large hydroelectric resources can have environmental trade-offs on such issues as fisheries and land use.
- **Conventional power** includes the combustion of fossil fuels (coal, natural gas, and oil) and the nuclear fission of uranium. Fossil fuels have environmental costs from mining, drilling, or extraction, and emit greenhouse gases and air pollution during combustion. Although nuclear power generation emits no greenhouse gases during power generation, it does require mining, extraction, and long-term radioactive waste storage.

Source: <https://www.epa.gov/greenpower/benefits-using-green-power>



Energy Production

Due to low or no global warming emissions, renewable energy is instrumental in the fight against climate change

Special Case: Nuclear Power - Is Nuclear Power Renewable Energy?

- Arguments in favor:
 - Low emission of greenhouse gases
 - New, emerging technologies might generate more fissile material than consumed
- Arguments opposed:
 - Supply of uranium on earth is finite
 - Radioactive waste products are a concern for millennia

The US states of Utah and Arizona include nuclear power produced by specific technologies in their definitions of renewable energy

Energy Production

Related Terms

- Fossil fuels
- Clean energy
- Alternative fuels
- Energy efficiency
- Availability, reliability, dependability
- Renewable energy certificates (RECs)
- Renewable electricity standard
- Water footprint

Further Reading

- US Department of Energy <https://energy.gov/>
- World Energy Council <https://www.worldenergy.org/data/resources/>
- Conserve Energy Future <https://www.conserve-energy-future.com/>
- Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Sustainable_development_-_climate_change_and_energy
- Union of Concerned Scientists <http://www.ucsusa.org/clean-energy/renewable-energy>
- US Energy Information Administration <https://www.eia.gov/renewable/>



Human Activity

Industry and Transport

Impact on the Environment

- Use of resources and energy
- Emission of greenhouse gases
- Emission of pollutants
- Noise
- Soil sealing
- Production and transport of hazardous materials



Industry and Transport

Production and Transport of Hazardous Materials

- A hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. (Source: IHMM – Institute for Hazardous Materials Management)
- Efforts to regulate hazardous materials started in Europe as early as 1959.
- Systems to classify and label chemicals were developed in the EU and other countries
- In 1992 the development of the UN-based Globally Harmonized System of Classification and Labeling of Chemicals (GHS) began with the goal of facilitating international chemical substance trade.
- As of 2017, GHS has been adopted to varying degrees in nearly all major countries.

Industry and Transport

Production and Transport of Hazardous Materials

Further Information

- How to Read and Translate Risk and Safety Vernacular Phrases in Technical Texts; Presentation by Matthew Schlecht at the 56th ATA Conference in Miami, FL
http://wordalchemistrytranslation.com/Risk_and_Safety_Vernacular_Phrases.pdf
- Review of Session “How to Read and Translate Risk and Safety Vernacular Phrases in Technical Texts; Presentation by Matthew Schlecht” by Martina Burkert http://ata-divisions.org/S_TD/2015/12/21/ata-56-session-review-how-to-read-and-translate-risk-and-safety-vernacular-phrases-in-technical-texts/
- What Goes There? The Inception and Development of Chemical Regulatory Legislation; Presentation by Matthew Schlecht at the 56th ATA Conference in San Francisco, CA
http://wordalchemistrytranslation.com/Chemical_Regulatory_Legislation.pdf
- ChemSub Online; <http://chemsub.online.fr/>
- ChemSafetyPro; http://www.chemsafetypro.com/Topics/GHS/UN_GHS_Purple_Book.html
- MSDS Hyper Glossary; <http://www.ilpi.com/msds/ref/index.html>
- CLP Regulation; <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A02008R1272-20150601>

Session Overview

History of Environmental Awareness

Disciplines within Environmental Science

Glossaries

What needs protection?

Human Activity

Environmental Terminology

- A moving target
- Often confusing
- Don't trust definitions
- Educate yourself



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