

Glossary

Abatement: A method or process which controls or reduces discharges and emissions of pollutants.

Acid Rain: Rain which has a pH level of 5.6 or less. A common cause of acid rain is emissions of sulphur dioxide.

Agenda 21: A document released at the 1992 Rio Summit which outlines a plan to achieve sustainable development.

Alar: A pesticide which was used by apple orchardists, among others, and was banned in the United States in 1989 following a well-publicized study that reportedly linked its use to cancer.

Alienate: The ability to transfer an asset to somebody else.

Alvarez Hypothesis: The hypothesis that the earth was hit by at least one comet some 65 million years ago which led to mass extinctions, including that of dinosaurs.

Ambient Permits: Pollution permits that specify the maximum permissible levels of pollution in the environment at defined sites.

Ambient Standard: A standard that specifies the, maximum permissible concentrations of pollution in the environment.

Amenity Value: The non-commercial value that is obtained from using an aspect of the environment. Walking in a forest is an example of the amenity value of a national park.

Biodiversity: The variation that exists in all living things across species and across individuals.

Biodiversity Prospecting: The cataloguing, sampling and collection of plant and animal species.

Biochemical Oxygen Demand (BOD): The demand for oxygen in both chemical and biological processes. BOD is frequently used as a measure of the effects of wastes on water quality and is calculated by measuring the weight of oxygen removed from a given quantity of water by microorganisms over a five day period, at a constant temperature of 20 degrees Celsius.

Boreal Forest: A vast northern coniferous forest found in Canada, Alaska, Russia and Scandinavia.

Carbon Sink: The ability of plants, such as phytoplankton in the oceans and growing trees, to absorb carbon dioxide from the atmosphere.

Charge: See pollution charge.

Chlorofluorocarbons (CFCs): Chlorine and fluorine-based chemicals that were used in propellants and coolants. CFCs have been shown to contribute to the thinning of stratospheric ozone.

Closed System: A system that exchanges no matter or energy with its environment.

Club Good: A good in which users are easily able to exclude others from using, but which is congestible. An example of a club good is a library.

Coase Theorem: A theorem named after Ronald Coase, the 1991 Nobel Laureate in Economics which states that if people do not behave strategically, transactions costs are zero, and the allocation of rights does not affect the marginal valuations of individuals, then the assignment of

private property rights internalize an externality. Moreover, it does not matter in terms of efficiency who receives the property right.

Command and Control: An approach for regulating pollution which often involves setting maximum permissible discharges.

Commercial Value: The value of a resource only in terms of its monetary benefits.

Common Property: A term often applied to a situation where property rights do not exist over a natural resource. It is more appropriately used to describe a set of community rights to property and resources.

Common-Pool Resources: Natural resources whose use is rivalrous but where the exclusion of users is difficult.

Commons: Common-pool resources that are managed with community rights, like community grazing rights.

Communal Rights: See community rights.

Community Rights: Property rights that exclude persons outside a well-defined community from using resources and which define rules over how resources should be exploited by members of the community.

Compliance: The act of complying with environmental and resource regulations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): 42 U.S.C. ss. 9601–9657; sometimes known as the Superfund Act. Established in the United States in 1980, this act created a fund to clean up hazardous waste sites and defined the liability of firms that contributed to these sites.

Congestible: A good is congestible if, past a certain threshold, an increase in the number of users reduces the benefits enjoyed by existing users.

Conservation: The management of the environment and natural resources that considers future generations and all market and non-market values.

Consumptive Value: The value of a resource only in terms of its worth when consumed or used by people.

Contingent Valuation Method: An approach used to quantify the monetary value of environment amenities by asking individuals direct questions.

Contingent Valuation Survey: Used to elicit responses from individuals regarding their monetary value of environment amenities.

Contributory Value: The value of a resource in terms of its contribution to other resources, species and ecosystems.

Convention on Biodiversity: The 1992 convention on biological diversity which allows for the free trade of genetic resources while providing ways for rich countries to finance biodiversity conservation.

Convention on Climate Change: A convention first signed at the Rio Summit and which came into effect in 1994 with the aim of controlling the emissions of human-made greenhouse gases.

Cost-Benefit Analysis: A method by which the total benefits and costs of a project or development are calculated, taking into account the fact that future benefits and costs need to be discounted. If the net benefits (discounted benefits minus costs) are positive a project is said to have a positive net present value.

Cretaceous Period: A period on earth from around 146 to 65 million years ago.

Current Dollars: The value of returns or costs incurred at some other time (past or future) in terms of today's dollars.

Decentralized Outcome: An outcome that arises from many individuals seemingly acting independently and in their own self-interest.

Deforestation: The transformation of forest land into other uses, such as agriculture.

Desertification: A natural or human-induced, process by which desert encroaches on arid or semi-arid lands.

Developing Country: A country with a low level of income, often characterized by relatively high rates of mortality and morbidity and a large proportion of its population living in rural areas.

Dichloro-diphenyl-trichloro-ethane (DDT): An organochlorine chemical used as an insecticide and which is now banned in a number of countries because of its ability to accumulate in animals high up in the food chain.

Dioxin: A toxic compound found in some herbicide and industrial wastes.

Discount Rate: The rate used to put future benefits and costs into current dollar terms.

Discounting: A method for evaluating benefits and costs in the future by valuing them in current dollars.

Divisibility: A characteristic of property rights which refers to how well its use and/or ownership can be transferred and/or split among users.

Duration: A characteristic of property rights which refers to the expected length of time the owner is able to exercise rights over the property.

Economic Development: process by which individuals become empowered to reach their full potential. This often involves raising living standards, enlarging economic opportunities, and increasing the availability and quality of services such as health care and education.

Economic Growth: The annual increase in the total real value of goods and services produced in a country.

Ecosystem: A distinct physical environment along with the interdependent flora and fauna that live there.

Efficient Outcome: An outcome where society is doing the best it can with what it has.

Emission (Quantity) Permits: Pollution permits which specify the quantity of emissions that can be discharged by a plant and/or firm in a given period of time.

Emission Reduction Credits: Credits obtained by firms by emitting less than the maximum permissible level. In the United States these credits can be traded under certain conditions.

Endangered Species: A species that faces a very high probability of extinction in the wild in the near future.

Enforceability: The ability to enforce the various characteristics of property rights.

Entropy: An index or measure of unavailable energy in a system. It is often considered as a measure of disorder in a system.

Environmental Assessment: An interdisciplinary approach that may use many different methodologies to assess the effect of a particular project or development on the environment.

Environmental Protection Agency (EPA): The U.S. federal regulatory agency charged with enforcing the various federal laws on the environment.

Equity: The degree to which an outcome is "fair" such that consideration is given to the gains and losses of individuals.

Exclusivity: A characteristic of property rights which refers to an owner's ability to exclude others from using the given right.

Existence Value: The value of a natural resource stemming from its existence in contrast to its consumptive value.

Externality: A situation where persons do not take into account the costs imposed on others by their actions, resulting in goods and resources not being used efficiently.

Flexibility: A characteristic of property rights which refers to an owner's ability to accommodate changes in both the asset and his or her own circumstances.

Flow Pollutant: A pollutant that affects people when it is discharged but does not accumulate in the environment.

Food Chain: The transfer of food from one organism to another in a hierarchical sequence.

Fugitive Resource: A natural resource that is mobile, such as a fishery.

Global Commons: Common-pool resources which are of global importance, such as stratospheric ozone. Most global commons are treated as open access.

Global Warming: The hypothesized warming of the earth's surface temperature due to increases in the concentration of greenhouse gases in the atmosphere.

Green Accounting: An approach designed to account for the value of the environment and natural resources, and human impact upon them.

Greenhouse Effect. The idea that increased concentrations of greenhouse gases in the atmosphere will increase the earth's surface temperature.

Greenhouse Gases: Gases such as carbon dioxide, methane, water vapour, nitrous oxide, and CFCs and halons which absorb and emit infrared radiation. Increased concentrations of greenhouse gases in the atmosphere are expected to lead to global warming.

Green Revolution: The large increase in yields of certain grains, such as rice and wheat, in the 1960s and 1970s due to the widespread adoption of higher yielding varieties by farmers in developing countries.

Gross National Product (GNP): A measure of the market value of all goods and services produced in a country in one year, plus investment income received from non-residents, minus investment income paid to nonresidents. Only transactions that pass through the market are included in the measure.

Habitat: The physical environment where populations of flora and fauna live.

Halons: organic compounds containing chlorine and bromine which contribute to the depletion of stratospheric ozone.

Heavy Metals: Metals such as lead, cadmium, mercury, tin and copper which, have a high atomic mass and can cause health problems at sufficiently high enough concentrations in the body.

Hydrocarbons: Compounds of hydrogen and carbon.

INBio (Instituto Nacional de Biodiversidad): A Costa Rican non-profit institute established in 1989 to ensure the conservation and wise management of Costa Rica's biodiversity.

Index of Sustainable Economic Welfare: An index that attempts to take account of environmental and resource degradation when accounting for a country's well-being.

Individual Transferable Quotas (ITQs): A private and transferable property right to a certain proportion of the total harvest or a fixed amount of fish. ITQs have been implemented in a number of countries including New Zealand, Iceland, Canada, United States and Australia.

Inflation: The percentage rise in the general price level in an economy. It is typically calculated as the percentage increase in prices over a year.

Institutions: The humanly-devised constraints that govern all social interactions.

Intergenerational Equity: The notion that the current generation should consider future generations in its actions.

Intergovernmental Panel on Climate Change (IPCC): An international group of scientists convened by the United Nations to assess the current state of knowledge about human-induced changes to the earth's climate.

Internalize: An externality is said to be internalized when individuals take into account the costs of their actions on others.

Irreversibility: The notion that certain actions can never be reversed. For example, species extinction is irreversible.

Joint and Several Strict Liability: A legal rule that makes every agent involved in a given accident liable for the full cost of damages.

Laterization: The release of metal oxides into soils due to exposure to the air. This often results in a hard brick-like soil of poor quality.

Liability: A legal rule which renders firms and individuals liable for the damages caused by their actions.

Limited-User Open Access: A property-right regime where the total harvest or yield may be fixed and the number of users is controlled but individual harvests are not.

Local Pollutant: A pollutant which has an effect only in a local area.

Loess: A particular type of soil sediment deposited by wind.

London Dumping Convention of 1972: An agreement to help prevent marine pollution and the dumping of wastes and other matter at sea.

Love Canal: A residential area in northern New York State which was declared a disaster zone after chemicals from hazardous wastes began to seep to the surface of the land.

Marginal Abatement Cost: The extra cost associated with reducing the amount of pollution by a small amount.

Marginal External Cost: The extra cost imposed on others from producing a small amount more of a good.

Marginal Private Cost: The extra cost incurred by a firm from producing a small amount more of a good.

Marginal Social Benefit: The extra benefit to society from producing a small amount more of a good.

Marginal Social Cost: The extra private and external cost associated with producing a small amount more of a good.

Methyl Mercury: A water soluble organic form of mercury which can accumulate in the bodies of organisms. At high enough levels it can cause mercury poisoning.

Minamata Disease: A debilitating disease first discovered in a bay in Japan which affects the brain and nervous system and can lead to death. It is caused by the accumulation of methyl mercury in the body.

Mobile Source of Pollution: A source of pollution that is not in a fixed location, like an automobile.

Montreal Protocol: A 1987 agreement signed by 43 countries to phase out the use of ozone-depleting substances

Natural Capital Stock: All aspects of the environment, including natural resources.

Natural Resource: Virtually anything that is not human-made and is potentially of value to humanity. Natural resources include the air we breathe, oil and gas deposits, forests and almost all aspects of the environment.

Negligence: The notion that an agent is liable for damages if he or she did not take reasonable precautions for a given set of circumstances

NIMBY. An acronym for “Not in my backyard” and refers to the desire of people not to have potentially dangerous plants and hazardous waste sites located near where they or their families live, work or play.

Nitrates: Chemical compounds containing nitrogen. An important source of water pollution is nitrate run-off from land treated with nitrogenous fertilizers.

Non-exclusive (Good or Resource): A good or resource that others cannot be prevented from using.

Nonrenewable Resource: A resource that can only be exhausted or depleted, such as oil and gas deposits.

Open Access: Sometimes called the “Tragedy of the Commons” and represents a situation where no property rights exist nor controls on the number of resource users exist.

Opportunity Cost: The cost of a good in terms of the other goods and services that must be forgone to be able to produce it.

Organic Farming: A method of farming which does not use artificial fertilizers, pesticide or herbicides.

Ozone Layer: See stratospheric ozone.

pH: A logarithmic scale which provides a measure of acidity or alkalinity. A measure less than pH7 is acidic.

Phosphates: Chemical compounds containing phosphorous which can contribute to water pollution.

Point Sources of Pollution: A source of pollution that is well-defined. A coal-fired power plant is a point source of pollution. *Polluter Pays Principle*: The principle that polluters should be responsible for paying the costs to society of pollution.

Pollution: Any substance, human-made or otherwise, which has a negative affect on a defined environment at a given concentration.

Pollution Charge: A compulsory payment made by individuals or firms to a regulatory authority for emitting pollution.

Pollution Subsidy: A payment made by a regulatory authority to individuals or firms to encourage them to reduce their level of pollution.

Polychlorinated Biphenyls (PCBs): Organic compounds, often used in electrical insulation, which at high levels have been associated with health problems in mammals, including humans.

Preservation: The management of the environment and natural resources with the intent to leave them, as much as possible, in the "natural state".

Private Good: A good or resource which the owner can easily exclude others from using and which is rivalrous in use. An example of a private good is a private motor car.

Private Rights: A property-right regime where ownership of goods or resources is vested in individuals or firms.

Property Rights: The rights, entitlements and privileges of individuals or groups of individuals to use goods and resources.

Property-Rights Regime: Any one of many different combinations of characteristics of property rights and ownership structures for property rights. The main property-right regimes are limited-user open access, community rights, private rights and state rights.

Public Good: A good which is non-exclusive, non-rivalrous and not congestible. An example of a public good is a lighthouse.

Quality of Title: A characteristic of property rights which refers to the owner's de jure rights to the good or resource in question.

Regional Clear Air Incentives Market (RECLAIM): An emission permit trading programme in southern California that encompasses hundreds of firms and seeks to control emissions of nitrogen dioxides and sulphur dioxides into the atmosphere.

Renewable Resource: A resource which has the potential to be self-perpetuating or self-regenerating. Examples of renewable resources are forests and fisheries.

Rent: An economic term which defines the surplus received over and above all the costs of production.

Resilience: The capacity of a natural resource, population or ecosystem to absorb or adapt to change without being dramatically altered following some kind of shock, human-made or otherwise.

Resource: See natural resource.

Resource Rent: A surplus over and above the cost of production that is attributable solely to the scarcity of the resource being harvested.

Retroactive Liability: A legal rule that makes firms and individuals retroactively responsible for any damages arising from their past actions even if these actions were lawful at the time.

Rio Summit: The 1992 United Nations Conference on Environment and Development which took place in Rio de Janeiro, Brazil.

Risk: A situation where it is possible to know all possible outcomes and the probability that each outcome will arise.

Rivalrous: The notion that one person's gain is someone's loss. *Salinization*: A process by which salts accumulate in soils thus reducing their fertility.

Second Law of Thermodynamics: The amount of unavailable energy (entropy) of a closed system continuously and irreversibly increases over time. Its implication is that all kinds of energy are gradually transformed into heat which eventually dissipates such that we are no longer able to use it to do work.

Soil Erosion: A natural and human-made process by which soil is dispersed via water and air.

Standard: A rule which applies uniformly across all firms or individuals.

State Rights: A property-right regime where ownership of goods and/or resources are vested in a central governing authority. State rights can coexist with other property-right regimes.

Stationary Resource: A resource which is not mobile, such as a gold deposit.

Stock Pollutant: A pollutant which accumulates in the environment, such as DDT.

Storable Resource: A natural resource, such as water, which can be stored for later use.

Stratospheric Ozone: Three oxygen atom molecules found at heights of between 15 and 45 kilometres which help protect the earth's surface from ultraviolet radiation.

Strict Liability: A legal rule which makes firms and individuals liable for all the damages caused by their actions, irrespective of whether or not they were negligent.

Subsidy: See pollution subsidy.

Subtractable Use: The notion that one person's use of a natural resource diminishes the yield for others.

Superfund: See Comprehensive Environmental Response, Compensation, and Liability Act.

Superfund Amendments Reauthorization Act (SARA): A 1986 act which gives the legal right to people who have paid for the clean-up costs from hazardous waste sites to collect these costs from other individuals or firms who contributed to the pollution at these sites.

Sustainable: The ability of a natural resource and/or system to be self-perpetuating over time.

Sustainable Development: The notion that we should manage our planet so that future generations have the potential to be as "well off" as the current generation. Tax: See pollution charge.

Threshold Effect: The idea that beyond a certain point or threshold a very small change to a system can have a very large effect.

Total Particulate Matter: A measure of the particles in a given volume of air.

Total Suspended Solids: A measure of the total particulate matter suspended in a liquid, usually water.

Transactions Costs: The costs of exchanging and enforcing property rights.

Transferability: A characteristic of property rights which refers to the owner(s) ability to transfer, bequest or trade ownership of the right.

Ultraviolet Radiation: Short wavelength electromagnetic radiation. Stratospheric ozone helps protect the earth's surface from ultraviolet radiation from the sun.

Uncertainty: A situation where many outcomes are possible but it is not possible to determine the probability of each outcome.

Unitization: The agreement of the joint owners of a common-pool resource to let only one individual or company exploit the resource but have the net revenues shared at an agreed-to proportion among all owners.

Vienna Convention for the Protection of the Ozone Layer: The 1985 convention which committed 36 countries to control emissions of chlorofluorocarbons.

Withdrawal Right: The right to extract a yield or harvest from a natural resource.