

---

# Glossary

*All glossary references are in chapter 3.*

**Adaptive systems** Human systems that exhibit capacities to learn from experience and improve structure and outcomes over time.

**Anticommons** The potential *underuse* of scarce scientific resources caused by excessive intellectual property rights and overpatenting in biomedical research.

**Archives** Organizations dedicated to the mission of collecting, storing, preserving, and providing access to cultural, historical, scientific, and other kinds of records.

**Artifacts** Physical-resource units—discreet, observable, namable representations of ideas.

**Associational commons** Exists when some good is controlled or managed by a group.

**Collaboratories** Tool-oriented computing and communication systems to support scientific collaboration.

**Collective action** Two or more individuals needed to work together in order to accomplish an outcome.

**Commodification** Alternatively, *commoditization*; originally a Marxist term, the turning of a noncommercial object into a market commodity; related to *commercialization* and *corporatization*.

**Common-pool resource** One of four types of economic goods. CPRs are either natural or human-made, where one person's use subtracts from another's and where it is difficult to exclude users.

**Common property** A legal regime; a jointly owned legal set of property rights.

**Commons** A general term that refers to a resource shared by a group of people and often vulnerable to social dilemmas.

**Commons-based production** When no one uses exclusive rights to organize an effort or capture its value, and when cooperation is achieved through social mechanisms other than price signals or managerial directions. Large-scale instances of such cooperation include *peer production* (Benkler 2004).

**Design principles** Characteristics of robust, long-enduring common-pool resource institutions (Ostrom 1990).

**Efficiency** Production, management, and use of a resource involving the greatest net benefits.

**Enclosure** Originally from the European Enclosure Movement, which privatized common agricultural fields and grazing pastures used by peasants and frequently put them in the hands of the elite.

**Equity** Appropriation from, and contribution to, the maintenance of a resource that is considered just by those involved.

**Facilities** Resource systems that store artifacts and make them available.

**Framework** A theoretical scaffolding helping to organize a research process, rather than a model or a theory. It helps researchers know which questions to ask.

**Free riding** Occurs when one person seeks their self-interest at the expense of others by not contributing to a joint effort when the person will benefit from the contributions of others.

**Hyperchange** Rapid, exponential, discontinuous, and chaotic change (Barrett 1998).

**Ideas** Nonphysical resource flow units: coherent thoughts, mental images, creative visions, and innovative information.

**Incentives** Benefits, or reduced costs, that motivate a decision maker in favor of, or against, a particular choice. <http://www.wwnorton.com/stiglitzwalsh/economics/glossary.htm>

**Institutional analysis** The analysis of how institutions are formed, how they operate and change, and how they influence behaviors and outcomes (Ostrom 2005).

**Institutional repositories** Archives of a university, research center, or other educational, cultural, or scientific organization that aim to collect, store, preserve, and provide access to the digital products of its members.

**Institutions** Rules affecting two or more persons that specify who decides what in relation to whom (Oakerson and Walker 1995).

**Intellectual property rights** Legal rights to intangible property—patents, trademarks, copyrights, and trade secrets. <http://usinfo.state.gov/products/pubs/intelprp/>

**Libertarian commons** Where anyone has a right to use (and sometimes also to contribute to) some public resource.

**Mertonianism** From Robert Merton's *On the Social Structure of Science*; generally used to describe a process of free, open inquiry, without crippling secrecy norms or major property claims, strongly reliant on the process of peer-reviewed publication and citation to drive hypotheses closer to an underlying objective reality.

**Nestedness** Layered clusters of actions and arenas.

**Open access** *Of land and tangible property:* Free entry to all without effective rules or restrictions.

*Of knowledge and information:* Free, online access to information without most copyright and licensing restrictions.

**Path dependency** Originally from new institutional economics, the phenomenon of outcomes being shaped by a previous sequence of decisions—that is, when outcomes are strongly affected by their past history.

**Polycentricity** Decentralized, alternative areas of authority—with multiple levels of rule and decision making.

**Preservation** A process that requires institutional commitment, technical ability, and economic means of ensuring that designated resources are available to future generations.

**Prisoner's dilemma** A formal model of the tragedy of a social dilemma. A classic game with two players in the roles of criminals being interviewed separately by police. If either gives information to the police, the other will get a long sentence. Either player can Cooperate (with the other player by being silent) or Defect (by giving information to the police). The game illustrates the problems of collective action and irrational group behavior when trust and reciprocity have little opportunity to develop and be expressed.

**Property rights** Legally sanctioned rules that affect the use of resources and the corresponding assignment of costs and benefits. (Libecap 1989, 229)

**Public domain** The realm of material—ideas, images, sounds, discoveries, facts, texts—that is unprotected by intellectual property rights and free for all to use or build on. (Boyle, <http://www.law.duke.edu/cspd/about.html>)

**Public goods** A good that is available to all and where one person's use does not subtract from another's use.

**Reciprocity** Where an individual contributes to the welfare of others with an expectation that others will do likewise, but without a fully contingent quid pro quo (Oakerson 1993).

**Repository** An organizational or epistemic digital archive that collects, stores, and usually distributes its contributors' documents.

**Resource Systems** See *Facilities*

**Resource Units** See *Ideas* and *Artifacts*

**Rules** Formal and informal prescriptions for what one must do, must not do, or may do. Rules are nested in constitutional, collective-choice, and operational levels.

**Scholarly communication** How scholars in any field (e.g., physical, biological, social, and behavioral sciences, humanities, technology) use and disseminate information through formal and informal channels.

**Self-governance** The ability of people to exercise and control the prerogatives of rulership in a society, requiring both knowledge and will on the one hand, and supporting and consistent institutional arrangements on the other hand.

**Social capital** The collective value of social networks (i.e., who people know) and the inclinations that arise from these networks to do things for each other (i.e., the norms of reciprocity) (from Putnam 2000).

**Stewardship** Taking on the care and responsibility of a resource to preserve it for future generations.

**Subtractability** Where one person's use subtracts from the available benefits for others (alternatively, *rivalrousness*).

**Sustainability** The persistence of the integrity and structure of any system over time (from Costanza et al. 2001).

**Tragedy of the commons** Metaphor based on Garrett Hardin's eponymous 1968 *Science* article has come to symbolize the degradation of the environment that is expected whenever many individuals use a scarce resource in common without accepted and enforced rules to limit their use.