Commons: The Network of Life and Creativity

Silke Helfrich

Commons are a network that sustains, that is woven together from our multilayered relationships to natural, social, and cultural resources. They are not separate from us; they do not exist without us. "There are no commons without commoning," as political scientist Massimo de Angelis says.

The concept of the commons sheds light on the two sides of this relationship, reveals its two faces. On the one hand, it highlights the nature and function of the resources under discussion. On the other hand, it raises questions about the state of the communities associated with those resources and the conditions required for their success.

The common pool resources concerned here – whether material or immaterial – **are the basis of all productive, reproductive, and creative processes**. Without genes, there can be no diversity. Without land, no food. Without light, no growth. Without sound, no music. Without language, no communication. Without knowledge, no progress. Without water, no life. In short, it is impossible to imagine any form of life or productive activity that is not created from the abundance of common pool resources. Natural resources can exist without us. But we cannot exist without them. The commons of the mind which has been collectively created over millennia is equally vital to us. It emerged from human creativity and is as important to education, culture, and medicine as the air is necessary to breathe.

The power to dispose over common pool resources is historically contentious terrain. This prompts us to **look to the past**. One of the first literary accounts of the conflicts over the commons, which goes hand-in-hand with the constant redefining of what is "lawful" and what is "unlawful," can probably be found in the ballades of Robin Hood.[1] Robin Hood, the once "lawless," advanced over the centuries to social revolutionary hero. The historian Peter Linebaugh investigates the historical origins of both the real and the legendary Robin Hood. He concludes that the first mention of a "Rob. Hod Fug," occurred right at the start of the 13th century[2] and thus, de facto, coincided with the publication of the Magna Carta in 1215. The Magna Carta is the most important source of the English constitution. It also became a crucial constitutional basis for the United States. It contains largely unappreciated calls against the exploitation of the forests as ordained by the king at that time.[3] The king wanted to degrade the forests to a source of lumber, convert the lumber into money, and invest it in those who promised him their loyalty. The Magna Carta, on the other hand, spoke of a kind of *common rights of the forest* (Chapters 47 and 48). In Chapter 33, it cites the *common right of piscary*, that is, the right to fish in waters that – formally – belong to others. **Private property** (in this case, of the king or the lords) **does not exclude the right of use by the general public here!**

Until the Norman conquest in 1066, the cultivation of carefully planted and grown wooded pastures in England proceeded according to a simple rule: **"The soil belongs to the lord, while**

1 *A Gest of Robyn Hode* ("Lettersnijder" edn.). Antwerp: Van Doesbroch, ca. 1510.

2 Rob. Hod is mentioned in 1225 in an administrative record, the Pipe Rolls of the archbishop of York. It is, however, unclear whether the Robin Hood ballades trace back to this historical figure.

3 King John, also known as John Lackland, Son of Richard II, succeeded Richard the Lionheart to the throne of England in 1199 and ruled until 1216.

grazing belongs to the commoners." That ended when the king switched over to reserving the forest for the hunt and for the pleasure and privileges of his followers. The forest became the supreme status symbol. The king's ban had driven the *commoners* from *their* forests, to which the legendary Robin Hood and his band retreated. We understand why the legend is so vibrant when we realize that the woods of that time were as important to the people as oil is for us in our time."[4]

The wheel of history continues to turn, yet the essence of the conflicts remains the same. How we **arrange rights of access and use of common pool resources** is also at the center of **today's** major social and political **conflicts**. This is exactly what the dispute over emissions trading shares in common with the struggle for preservation of cultural and biological diversity or opposition to software patents. This, although often unrecognized, is where the interests of the environmental movement meet with those of the movement for free software and free culture. The Heinrich Boell Foundation publications on the commons are designed to illustrate the **convergence of these movements**.

By looking at the past, we can identify a mechanism of the present, which will presumably also continue to resonate into the future. **To the extent that a common pool resource is discovered to be usable in an economic sense, its enclosure will proceed in the private interest**. Yesterday, it was the earth's largely visible natural resources. Today, it is the earth's visible and invisible natural and cultural resources. Will it be the mineral resources of the moon tomorrow?[5] For different common pool resources will come into focus depending on what is the central productive source of an economic system. "So if you're interested in predicting where the next big transfer of wealth from public to private hands is going to happen, you need to look for processes of enclosure," John Hepburn aptly writes.[6]

The enclosure of land went hand-in-hand with the agricultural revolution. Industrial society helped create a breakthrough in the patent system – also in the area of intellectual property. The knowledge society is characterized by both patented and technologically enforced private access to algorithms, information, and knowledge.[7] The revolution in biotechnology is associated with patents on life forms and living processes. Every **technological leap** increases the possibilities for privatization, because, among other reasons, the building blocks of knowledge and life that fall prey to this process are permanently shrinking. Fragmentization seems to go hand-in-hand with privatization. Today, there are patented chemical elements[8] and gene sequences. Tomorrow, matter at the nano scale will be patented. This series does not discuss the issue of the social benefit of patents or the highly controversial expansion of patent law to natural phenomena; rather, it addresses an interrelationship that arises with the erosion of the commons: **the smaller the individually controllable and controlled elements (resources), the greater the power to control the entire production process.**

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4 Peter Linebaugh: *The Secret History of the Magna Carta*. Boston Review. Summer 2003.

5 Currently, the resources of the moon are still considered the "common heritage of mankind" under the Moon Treaty (which entered into force for the ratifying parties in 1984 as a follow-on to the UN Outer Space Treaty).

6 John Hepburn, *Reclaiming Commons – Old and New*, presentation by John Hepburn to the Other World's Conference, University of Technology, Sydney, April 2005.

7 For example, through copyright mechanisms

8 The patent for the artificially produced element Americium and for the manufacturing process of Curium have been issued to Glenn Seaborg.

In their contribution, the Alternative Nobel Prize laureate Pat Mooney and Silvia Ribeiro explain, with a critical view to the latest technological developments, that this process cannot be stopped even by our sound judgment:

> Researchers are learning to follow the neurological pathways from senses to one (or several) responding parts of the brain. They are also learning how to grow neurological connections and redirect impulses. Publicly, the purpose of this research is to help those in chronic pain, to suppress anxiety, or to vanquish addictions. But, the same research could wipe away fear in soldiers or induce apathy among anti-globalization protesters.

Yet virtually all the contributions presented here show how the **enclosure of common pool resources, which has been enforced for centuries**, is increasingly breaching the commons. Bit by bit, common pool resources are being extracted – not in order to be used, but to be consumed; not to be increased in the interest of the common welfare, but to be privately appropriated. Particularly over the past 150 years, this process of appropriation was justified with the argument that it would increase productivity – "efficient allocation." But **commons were and are always productive.** Humanity has always created and extracted from them – wood from the forest, fish from the seas, potable water from ground water, motivation from social commons, ideas from the commons of the mind, healing skill from knowledge of indigenous plants. How "efficiently" we produce and create from the common pool resources depends on many factors. It is also essential to recognize that the commons do not merely have a providing function; they are multifunctional.

So the central question is not how efficiently we use the commons in a productive sense but **to what end, to whose benefit, and in whose interest common pool resources may and may not be used and by whom.** Property issues play an important role in this respect.

Let us now consider the second side of the commons: that of the community. The community (communities) appear(s) to be constituent to the notion of the commons itself. To describe a commons, one must not only look at the concrete resource but must also ask with which specific community (communities) it bears a relationship. Particularly in the United States, the concept of community has experienced a significant renaissance over the past 20 years. Authors such as N. Bellah and others (*Habits of the Heart*, 1985), Robert Putnam (*Bowling Alone*, 2000), and Amitai Etzioni (*From Empire to Community*, 2004) express support for the restoration of community as a new form of social integration – a concept that has had a tradition in the United States since the nation's founding days.

Several authors included in this web collection give accounts of successful collective management of the commons and the respective *communities*. For example, the environmental expert Jean-Pierre Leroy from Brazil describes the struggle to arrange rights to access and use natural and cultural resources within the Gurupá Amazon community (Pará, Brazil) in a fair manner. The anthropologist and political scientist Leticia Merino likewise critically reflects on the various forms of managing Mexican forests. Sunita Narain, an Indian environmental expert, reports how Indian village communities are successfully overcoming the acute water shortage and ultimately ensuring that "markets truly work for the people."

One of the world's most renowned commons researchers, Elinor Ostrom, sums up in her contribution:

> We have learned that citizens do play an essential role in the governance of common pool resources and that efforts to turn over all of the responsibility for governing these resources to external experts are not likely to protect them in the long run. The complexity of the resources at local, regional, national, and global levels do require complex governance systems involving citizen input in diverse fashions.

Thus, when we talk about commons, we must think of them in relationship to their communities, to commoners, to a new kind of citizenship.

Commons are the wealth of us all. The authors of this series, particularly American author and commons expert David Bollier in his introductory essay, highlight this fact. Yet they always have to be managed in a way that allows them to continue developing their function as commons. That is mandatory.

We are the **decisive players** in revitalizing and modernizing the commons in our various social relationships. The vitality of the relationship between the resources and the relevant community (communities) is key to mastering the challenges facing us. Escalating ecological crises, ubiquitous processes of concentration, and ever deepening privatization of knowledge and life, in other words, the fragmentation and "enclosure"[9] of our environments have brought on the phenomenon that more and more people are being forcibly cut off from the network that sustains us.

As this process continues, some people have been able to substitute access to common pool resources for access to other means – such as money or power. Entire regions have gradually replaced the security that use of commons provides to important spheres of life almost exclusively with the purchase of goods. This too offers certain security (as well as comforts), but of the kind that is generally tied to the availability of money. That is why a substantial number of other people are being left behind. "Therefore, maintaining the integrity of the commons is the same as maintaining the integrity of their social relationships, values, and identity," Bollier writes.

Yet another trend within the common goods sector gives us reason not to become resigned. As some traditional commons (soil, water, atmosphere) disappear, we are simultaneously witnessing a dynamic **process of emerging new commons**. It frequently starts when we clearly analyze the social and cultural bursts that accompany the private appropriation of common pool resources. A prime example of this is the birth of free software about 25 years ago. The hacker and father of the free software movement Richard Stallman described it in an interview documented here:

> The free software movement takes for granted certain ideas of freedom and justice: namely, that **people should control their own lives and should be encouraged and permitted to cooperate**.

The free software movement has been guided by this idea in all its actions. It is this idea that determines how free software products should be produced and distributed. Within the context of digitalization and our increasingly knowledge-based society, the fundamentals of our economic system are currently shifting in such a way that the availability of immaterial, cultural, and informational common pool resources is more important than ever. It is therefore no coincidence that the explosive growth and influence of the commons movements is occurring

9 The term traces back to enclosure of commons pasture in 18th century England.

precisely in this sector (use of knowledge, information, code, culture). Free software, the community of Wikipedians, and the movement for free culture bear eloquent testimony to this trend. Yet a **fundamental transformation within the economy and society** must similarly occur **in respect to the rights to use all common pool resources.** For not only have the exploitation and production models of industrial society evidently become obsolete as a means to promote innovation and creativity but natural resources have also grown absolutely limited as the basis of our economic activity. There is no clarity yet on which paradigms will shape the future. But what is clear is that we do need new paradigms in order to set out again on the path to a new livable society of the 21st century.

Pointing in this direction, Yochai Benkler coined the term "commons-based peer production" and defined "commons" as follows:

> . . . a particular type of institutional arrangement, for governing the use and disposition of resources. Their salient characteristic, which defines them in contradistinction to property, is that no single person has exclusive control over the use and disposition of any particular resource. [. . .] As we transition to a networked information economy, every point of control over the production and flow of information and culture becomes a point of conflict between the old, industrial model of production and the new distributed models.

The German computer scientist Christian Siefkes takes up this idea and discusses the components of a commons-based society. Such a society "springs from numerous communities" – communities "that make and develop their own rules to create, preserve, and use commons." This is an intrinsic feature of the commons.

Yet the current crisis is not just of a social or environmental nature, it is, above all, also a **crisis of ideas**. Conservative thought has ossified into a "conserving" and "conserved" way of thinking. Liberal thought has never developed responses to the multifaceted processes of disintegration associated with the erosion of the commons. It has admittedly never sought such responses, but instead actively helped to escalate the crisis of the commons, which is a crisis of human society. And the thinking of other factions of the left has for decades immersed itself in the dichotomies of government versus the market, cooperation versus competition, private property versus public property. It has frequently gone on the defensive. Dichotomous ways of thinking, however, do not appear to be very helpful or geared toward finding solutions. They are unable to sufficiently guide us towards new essential and constructive principles for an equally innovative and conservation-minded economic system.

To approach an **ideal commons-based society**, we need **a systematic advocacy of commons**. That seems to be stating the obvious. Yet, in many cases, commons simply are not visible. Who would think to ask, for example, Who is entitled to silence, to the electromagnetic spectrum, or to the resources of the deep sea? But if we are unable to define and name commons as such, then we are also unable to develop an advocacy of them.

The interdisciplinary **social debate** on the commons, which, among other things, is aimed at revealing and identifying the commons, has only just begun worldwide. Its supporters are building bridges to each other and sharing experiences that allow us to conceive of and partially anticipate an **economy and society with a growing commons sector**. So far, there have only been initial attempts to develop indicators for the vitality and robust nature of this sector – beyond gross national product and growth curves. The emerging debate will have to answer

questions concerning the value of commons to a society. It is also clear that commons are not "measurable" in a market-economic or mathematical sense; rather, their value and benefits are limitless.

The commons debate is, as clearly can be seen from these contributions, about reflecting in a fundamental, candid, and collective manner on our quality of life and the quality of life of future generations. While expansion of market-facilitated economic and social relationships may have helped meet numerous (individual) needs (assuming access to means of payment), the market and growth are, nevertheless, hardly capable of strengthening social cohesion.

What we need to do is to analyze life and economic activity in terms of the diversity and functional development of commons. What we need is a world where there will continue to be conflicts but not top-down "solutions to those conflicts," where exclusion from access to common pool resources is conceivable or even necessary – whether to preserve those resources or whether out of respect for the historically acquired rights of those who have always cared for those resources – but also where fair access to vital resources is guaranteed, a world where wealth and poverty are not defined by availability of financial resources but by the close-knit nature of the network that sustains us.

In short, we are talking about a world in which the energies of commonly available resources and the inspirations that spring from their use are accessible to everyone in all their abundance. There are no easy solutions on the path to that goal. This is a central insight of commons research, as is the realization that private property, government property, and common property have all, at the same time, proven their effectiveness and their failures. Rather, it is a complex undertaking to establish and reflect on **institutions** and **administrative regimes for commons management**. This effort depends on numerous factors – on the nature of the affected resource, the history of its origins, the mechanisms of production to which it is subject, the regulatory systems into which the respective community is integrated, and many others.

Managing global natural commons also presents a special problem. Peter Barnes, however, succeeds in proposing a simple and logical model for administering our rights to use the atmosphere – the sky trust (see: http://onthecommons.org/content.php?id=1543). By contrast, there seem to be few promising solutions to the history of overfishing in the world's oceans. In his article, Michael Earle assesses numerous attempts at regulation which have already been "tried" or are on the table. The future looks grim. And finally, Jamie Metzl is dedicated to examining the ethical and moral reasons for the government to set limits on the manipulation of human genetic resources. The human gene pool is one of those commons that particularly powerfully illustrates our bond with the common pool resources.

Anyone who expects prescriptions, a one-size-fits-all solution, or urgent appeals for government regulation and against market-driven instruments will be disappointed by this web collection. For what will enable us to progress in a careful and farsighted manner differs from the already mentioned dichotomous thinking, above all, in two respects. First, **diversity**. If it is true that the only functioning principle of nature is diversity, then the diversity of common pool resources, the diversity of the related communities, and the diversity of the systems for administrating and managing commons is precisely what will allow us to look to the future with optimism.

Another central aspect is to strengthen the role of the individual within his various communities

and thus to strengthen the role of society vis-à-vis the market and the government. Argentine social scientist Esteban Castrol goes so far as to say that the commons debate is capable of **adding a new dimension to the concept of (government) guarantees**:

> There is no certainty that human emancipation [. . .] will be achieved, not any time soon at least to judge by the increasing alienation of common citizens caused by hegemonic neoliberal globalization in recent decades. However, the defense and reclaiming of the commons constitute one of the front lines in the ongoing struggle over the territory of substantive democracy and citizenship. In the process, it can be expected that new social forms will emerge that may help to re-equilibrate the system in a higher level of human organization that privileges intra- and inter-generational cooperation and solidarity over the blind dynamics of competition and the survival of the fittest.

Many communities of the 21st century are able to organize themselves globally – thanks to technology. They are building virtual networks of new dimensions. That moves the commons debate from the defensive and catapults it out of the past and into the future. Numerous ideas, production and distribution processes, proposals for redefining what is lawful and what is unlawful, systems of organization, and supporting institutions are ensuring that the ideas of a commons-based economy and society will take hold in innovative environments and create something new.

The conflict surrounding the commons shines a spotlight on the common welfare and the interests in preserving common pool resources. The prospects for citizens themselves are crucial in this regard, for we are not only beneficiaries of a flourishing commons sector but also, at the same time, the decisive stakeholders in bringing about the necessary expansion of the commons sphere. **We are "commoners"** and, as such, we have a birth right to numerous commons. Other common pool resources, like Wikipedia, we have developed together. Still others we have financed together through taxes and other contributions. We are the ones who have a decisive influence on the structure of the commons. We therefore need to re-establish the networks that sustain us. Often, it is also just a matter of mending the networks, away from hierarchical ties that rely on few control points and towards ties among equals.

To be able to do this and thus ultimately to create greater individual ability to act, we have to be conscious of the value commons have for our quality of life and that of future generations. This essay collection is intended to offer food for thought.

When we see the world from the perspective of society sharing in the commons, we are forced to stop focusing on individual issues or commons systems – if only for a moment. For this moment, we need our high beams instead of the headlights focused on our own lanes. We have to illuminate the new environment in order to be able to re-establish the network. The debate on who should be responsible for our collective resources is a debate about the state of society.

The Commons:
A Neglected Sector of Wealth-Creation

David Bollier[1]

When governments and corporations try to solve problems, they tend to see only two general types of solutions – *government action* and *market competition.* *For many people it is* customary to see these two arenas of power as the only effective regimes for managing resources. Yet it has become clear (in recent years) that there is a third, largely neglected realm of solutions: *the commons.* The commons describes a wide variety of phenomena, it refers to social and legal systems for managing shared resources in fair, sustainable ways.

So, it can refer to shared resources that a community builds and maintains (libraries, parks, streets); national resources that belong to everyone (lakes, forests, wildlife); and global resources that all living things need to survive (the atmosphere, water, biodiversity). The commons can also refer to "gift economies," such as science, that encourage the creation and circulation of research and information. The Internet is a host to countless commons built and maintained by people with shared interests, from open software groups to Wikipedia to specialty archives. Implicit in the commons is a set of values and traditions that give a community identity and help it govern itself.

Although there are countless varieties of commons, many of them quite idiosyncratic and rooted in particular cultures, most of them fall into three general categories – gifts of nature, material creations, and intangible creations. This article offers an overview of different types of commons and governance rules. It also suggests how a *discourse of the commons* can open up new types of political and policy conversations.[2]

Why Talk About the Commons?

It is important to talk about the commons because it helps us identify a broad class of resources that ordinary citizens and/or specific communities have a political and moral stake in controlling and managing. A great many commons are being converted into private property so that they can be bought and sold in the market. This is one of the great injustices of our time, one that conventional politics tends to ignore. In both overt and subtle ways, free market ideologues in business and politics are intent on privatizing resources that people collectively own; they wish to convert publicly controlled resources into private property. This process is known as the "enclosure of the commons."

Neoliberal political systems are essentially engines of market enclosure. The political economies of industrialized societies tend to regard shared resources as under-leveraged market assets. They are seen as raw inputs for generating corporate profits. Restrictions on using them for market purposes, such as social or environment regulation, are often criticized as impediments to wealth-creation, and therefore morally suspect. In the neoliberal worldview,

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1 *El autor es Editor of OntheCommons.org, a website sponsored by On the Commons, and is author of Viral Spiral: How the Commoners Built a Digital Republic of Their Own (New Press, 2009).*

2 cf. contribution of Helfrich and Haas

private property rights offer the most efficient way to produce wealth, and this constitutes "progress."

The point of talking about the commons is to open up a larger conversation about types of wealth and value. Not all wealth can be expressed through a market price. And indeed, other types of value – ecological, social, democratic, moral – need to be fully recognized and actively protected. The very epistemology of conventional economics has trouble doing this; the commons is helpful because it offers a way to name species of wealth that classical liberal and neoliberal economics prefers to overlook.

For example, market champions like to ascribe a monetary value to everything – land, crops, music, art – and then focus on maximizing the economic exchange value of those resources, as determined by price. So air and water are treated as free and limitless resources, for example. But market valuations often ignore the actual costs of the resources used. They also tend to ignore the costs displaced onto the environment, workers and the public, otherwise known as "economic externalities." A market may be highly productive and efficient while failing to acknowledge that it is destroying the commons: pollution dumped into the environment, children used as labor, factories that have dangerous safety risks.

The commons helps us develop a broader understanding of "wealth" by introducing the idea of *inalienability.* Certain resources have value beyond any price, and should be insulated from market forces. The beauty of nature, the sanctity of specific places, the ecological value of wildlife, the ethical norms of selling safe products, the moral values and traditions that define a community – all represent wealth beyond price.

With this broader sense of value, most commoners prefer not to monetize their resources. In a commons, long-term stewardship of resources are seen as more important than maximizing profit or sales. Accordingly, resources really understood and managed as commons are allocated on a free or non-discriminatory, low-price basis, or according to social need or ecological sustainability. Some communities may authorize the sale of resources in the market, but only if it can be done sustainably and without harm to the integrity of the commons.

The role of government is to act as a conscientious trustee of the citizens resources. But in market-based societies, it is all too common for politicians and government agencies to fail to perform this task; some argue that this is a systemic failure of neoliberalism. Governments of any sort are prone to corruption, of course. Politicians are known to give politically connected friends free or discounted access to collectively owned minerals, grazing lands, beaches and airwaves, for example. Or they sell resources that should not be sold at all -- e.g., land that has important ecological value or sacred significance. The growth of the market sector in recent decades, relative to government, has only intensified the pressures to enclose the commons.

The Myth of the "Tragedy of the Commons"

But isn't the idea of the commons doomed to failure? For decades, conventional economists have assumed that any shared management system would inevitably result in a "tragedy of the commons."

This myth was popularized by the ecologist Garrett Hardin in a famous essay in 1968, in which

he declared that people who share land as a commons will inevitably over-exploit it.[3] He cited the example of a common pasture to which anyone may add more livestock for grazing without restriction. When individual farmers can take private benefits from the commons without regard for its overall "carrying capacity," Hardin said that a shared resource will necessarily be over-exploited and fall into ruin. Hence, the "tragedy of the commons."[4]

The most attractive solution, according to conventional economists, is to assign private property rights in land and let the "free market" decide how it shall be used. Economists argue that only private landowners will have the necessary incentives to take care of the land and make worthwhile investments in it; it is said that government and individuals have neither the proper incentives nor skills to manage the commons competently.

To support this general conclusion, economists often cite "prisoner's dilemma" game experiments that demonstrate the difficulties of getting individuals to cooperate to solve shared problems. In his influential 1965 book, *The Logic of Collective Action*, economist Mancur Olson argued that "rational, self-interested individuals will not act to achieve their common or group interests."[5] The myth of the "tragedy of the commons" is routinely invoked to try to discredit the idea of the commons. A generation of economists and policy experts has used the story to criticize common ownership of land as impractical – and to celebrate private property and markets as the best system for managing resources.

Critics have challenged the tragedy of the commons narrative and prisoner's dilemma experiments as unrealistic models of the real world, however. They point out that in real life, members of communities develop social trust among each other. They collaborate and solve problems. Scholars of the commons, particularly those connected with the International Association for the Study of the Commons[6], cite hundreds of functioning commons, especially in developing nations, that reveal Garrett Hardin's abstract scenario as empirically erroneous.

It has also been pointed out that the "tragedy scenario" that Hardin described is not, in fact, a commons. He describes a regime of *unregulated open access* to land. To a natural resource without boundaries or governance rules. Anyone can appropriate whatever he or she wishes. No one is governing the common pool resources Hardin talks about. In other words, the story he tells is not about common land, it is about no man's land.

But this is not what a commons is. A commons is a social system – a system of self-governance and consensus rights for controlling access to and use of a resource. Successful commons generally have well-defined boundaries. They have rules that are well understood by the participants of a commons. There is sufficient openness so that "free riders" can be identified and punished.

The governance rules in a commons may be informal and implicit, and embodied in social traditions and norms. Or they may be explicit and formally codified in law. In either case, the people who participate in a commons have a shared social understanding about who has rights

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3 HARDIN, Garrett: The Tragedy of the Commons. Science. December 13, 1968, pp. 1243-1248.

4 Compare: LERCH, Achim: "The Tragedy of the *'Tragedy of the Commons'*".

5 OLSON, Mancur: The Logic of Collective Action: Public Goods and the Theory of Groups. Cambridge, Massachusetts. Harvard University Press, 1965), p. 4.

6 The International Association for the Study of the Commons (IASC), founded in 1989 as The International Association for the Study of Common Property (IASCP), is a nonprofit Association devoted to understanding and improving institutions for the management of resources that are (or could be) held or used collectively by communities in developing or developed countries. www.iascp.org/

to use the land's resources and under what terms.

The point is simple. A commons is not always a tragedy. A commons can be entirely sustainable. It is a serious and sustainable alternative to market management of a resource.

The Tragedy of the Market

The real tragedy, many commoners argue, is the *tragedy of the market*. It is the market, after all, that relentlessly uses up so many of our precious gifts of nature and leaves pollution and waste everywhere, without even providing an accurate economic accounting of the actual costs.

The problem with conventional economics is that it too often fails to recognize the value that the commons contribute to market activity. Mainstream economists usually do not identify the *hidden market subsidies* that come from the commons and the *unacknowledged negative economic externalities*[7] that companies dump into the commons.

Consider, first, the hidden market subsidies. Broadcasters who use the airwaves for free are using a public resource while providing little in return to the citizens who own the airwaves. When governments give timber companies cheap access to public lands, or give drug companies exclusive rights to taxpayer-financed drug research, they are giving those companies a hidden subsidy. When bottled water companies take large quantities of pure water from underground aquifers for free, they are essentially stealing from the commons.

"Economic externalities" are another set of costs that are not borne by buyers and sellers, but instead shifted to the commons. It is typically cheaper for a company to dump pollution into the atmosphere and to dump radioactive wastes in the ground than to clean them up (or "internalize" the costs). These economic externalities are unacknowledged costs of market activity – costs that are typically borne by the commons.

A commons-based economics, then, would take proper account of the *full costs* of market activity by recognizing its hidden subsidies and unacknowledged (social, environmental and moral) externalities.

To talk about the commons helps us begin to see economic activity in a more holistic way. Just as environmental economists have helped us recognize the fuller context of market activity, the commons can help us recognize the social, environmental and moral factors that quietly subsidize normal market activity. It helps us see the public schools that provide educated workers, the regulations that make markets stable and trustworthy, the gifts of nature that companies regard as free. The commons helps us *name* these other, non-monetized sources of value – and in so naming them, we can begin to understand them properly and defend them.

[7] In economics, an externality (or spillover) is an impact on any party not directly involved in an economic decision. An externality occurs when an economic activity causes external costs or external benefits to third party stakeholders who did not directly affect the economic transaction. In a competitive market, the existence of externalities would mean that either too much or too little of the good would be produced and consumed in terms of overall cost and benefit to society. If there exist external costs (negative externalities) such as pollution, the good will be overproduced by a competitive market, as the producer does not take into account the external (environmental and social) costs.

Governing the Commons[8]

How shall the commons – or more specifically, common pool resources – be managed in order to preserve them as commons? This is a key question to the survivability and health of the commons. The answer depends a great deal on the nature of a shared resource and the specific community. One major determinant is whether a resource can be used by many people without destroying it. If too many loggers cut trees in a forest, it *will* destroy the forest. But when lots of programmers join an open source software community and lots of users use the same software at the same time, it doesn't deplete the commons; it *adds value* to the shared body of software code. A forest can be "used up," but a software commons is enhanced by greater participation.

One important factor in the management of a commons, therefore, is whether a resource is depletable or not. Natural resources tend to be depletable (or "subtractable"), while information and culture cannot really be "used up," especially in the age of the Internet and cheap digital reproduction. That is why the information commons tends to grow in value as more people use it – a phenomenon that property law professor Carol Rose calls a "comedy of the commons."[9]

Another important factor is whether a resource is "excludable" or "rivalrous." It is hard to prevent people from benefiting from resources like lighthouses and sunsets, to which everyone has free access; they are "non-excludable." Also, my enjoyment of these resources does not diminish someone else's enjoyment; they are "non-rivalrous." Such non-exclusionary, nonrivalrous resources are known as "public goods." You cannot easily put a meter on them or prevent people from reaping benefits from them.

This analysis suggests that depletable commons require commoners to establish limits on the use of the shared resource, allocate those rights fairly and police usage. By contrast, managing a "digital commons" is less about managing finite resources than managing social relationships. Online commons typically focus on the criteria of meritocratic leadership, open participation, the cultivation of social consensus, reciprocity and the exclusion of vandals and spammers. The types of governance and decisionmaking for a given resource will depend on whether it is depeletable or non-depletable, rivalrous or non-rivalrous, and excludable or non-excludable. It will also vary by the peculiar culture and history of a given community, and the nature of the resource. Thus, lobster fishermen in Maine will manage their limited supplies of lobster in different ways than farmers in Valencia, Spain, manage limited water supplies, or the Gutenberg Project, an international project which manages the digitalization of public domain books.[10]

Interest in the commons is surging nowadays in part because it is seen as an antidote to market enclosure. New technologies and powerful corporations are seizing control of many resources that have long existed as public goods. Two prominent scholars of the commons, Elinor Ostrom and Charlotte Hess, write: "The ability to capture the previously uncapturable creates a fundamental change in the nature of the resource, with the resource being converted from a nonrivalrous, nonexclusionary public good into a common pool resource[11] that needs to be

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8 Compare: OSTROM, Elinor: Governing a Commons from a Citizen's Perspective.

9 Carol M. Rose, "The Comedy of the Commons: Custom, Commerce and Inherently Public Property," 53 *University of Chicago Law Review* 711-781 (1986, reprinted in Rose, *Property and Persuasion: Essays on the History, Theory and Rhetoric of Ownership* (Boulder, Colorado: Westview Press, 1994).

10 http://www.gutenberg.org/wiki/Main_Page

11 A "common-pool resource" is a shared economic good, independent of any system of legal

managed, monitored, and protected, to ensure sustainability and preservation."[12]

The Commons: A Different Framework for Managing Resources

The commons represents a very different logic for managing resources than the market. It offers forms of *ownership* and *management* that can be more equitable than private property. It seeks *sustainability* of the resource over the long term, unlike the market's propensity for maximizing short-term (financial) benefits. The commons also honors *self-governance* as an important principle. Far from a "tragedy," the idea of citizen-management of the commons is to establish fair and effective rules for allocating access to a shared resource. It can assure proper maintenance of the resource while protecting against "free riders" who might use the resource without contributing to its upkeep.

The social systems for managing a commons can vary immensely, however. There is no one-size-fits-all template. Different management systems are needed depending upon the nature of the resource, its scale and the relevant community of commoners. For example, small fishing communities may allocate the rights to fish in certain waters, and police against cheaters, more effectively than a federal government. Yet when it comes to the electro-magnetic spectrum used by broadcasters, the federal government is probably needed to provide an overarching system of technical and legal rules. But note: those rules could favor large corporate broadcasters seeking to maximize market gains or small nonprofit broadcasters functioning as local commons. Still other commons, such as open source programmers, can operate wholly independent of government (so long as they can use self-devised licenses such as the General Public License, based on copyright ownership, to assure free sharing and re-use of their code). Programmers like many other commoners use both formal rules and informal social norms to self-organize themselves.

Government and the Commons

In many instances, government acts as a steward for the public in operating libraries, parks, civil infrastructure, airwaves, and other resources that belong to the nation as a whole. But it is important not to conflate a government program with the commons. The two may overlap, but they are not the same.

The point of naming a shared resource as a commons is to emphasize that the resource belongs to *the people*, not to the government, and therefore should serve larger purposes than those afforded by the market. Once a resource is considered "government property," its moral and legal connection to the citizenry begins to wane. The commons emphasizes the prior claims of citizen - the commoners - over and above government.

Second, the government has a larger role to play than bureaucratic management. In many cases, it can best support the commons by facilitating the establishment of new commons institutions that can be managed by the commoners themselves. Such self-governance at the proper scale of

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property rights. Scholars have often used this term to distinguish a resource or a good from a property regime, especially from "common property," which denotes a resource that is jointly owned through a set of legal rights.

[12] HESS, Charlotte & OSTROM, Elinor: Understanding Knowledge as a Commons: From Theory to Practice. Cambridge, Massachusetts. MIT Press. 2007. p. 10.

the resource can help assure better management and accountability. Examples include cooperatives, local land trusts, community broadcasting and community markets[13].

Government bureaucracies tend not to be very accountable to the commoners, even if they nominally serve them. It is customary to say that the government owns the treasures in the national museum, the highways and wilderness preserves. But in truth, a nation's *citizens* own those resources; the government is merely a trustee. (It's worth noting that the idea that *anyone* can own a living entity as dynamic and sovereign as nature is, of course, an anthropocentric conceit.) To talk about the commons, then, is to reassert the people's moral if not legal rights in reaping benefits from collective resources, thus maintaining them. It is to focus on the ways in which commoners can keep the government accountable in serving the broader public interest, over and above market objectives. The commons helps us articulate an arena of citizen power, self-governance and socially rooted value.

Although we associate the commons with the *social management* of a resource, there are some variants, while bureaucratic and based on the money economy, serve worthy goals. Canadians and Brits regard their national health care systems as a type of government-managed commons: a resource that is available to all (but not for free), based on people's needs, and supported by all, based on their means. Government has to act as a steward of the commons, and civil society and citizens at the individual level have the responsibility to reclaim such stewardship if convened democratically.

Another impersonal commons model is the *stakeholder trust*, in which assets are managed by non-governmental trustees on behalf of a specific group of people. In Alaska, for example, the state government established the Alaska Permanent Fund to serve as a trust fund for revenues derived from the sale of oil on state lands. The Fund, now worth US$40.1 billion, generated dividends of $1,107 for every citizen in the state in 2006. In cases where a country needs to exploit mineral resources or fossil fuels not just for use value but for exchange value, the Fund offers a versatile policy mechanism for equitable sharing of (monetary) benefits from common assets while also reducing inequality and preserving other commons.

A more recent innovation is the Sky Trust, a trust proposed by Peter Barnes and inspired by the Alaska Permanent Fund. Barnes proposes auctioning rights to emit carbon. Large corporate polluters will pay significant sums into a trust fund in which all citizens own equal shares. The expense of buying pollution rights will encourage companies to find more cost-efficient technologies to reduce their pollution. The trust fund, in turn, yields dividends that helps citizens offset the higher prices they must pay for using resources (like oil) requiring pollution abatement. The principle behind the Sky Trust – also known as "cap and dividend" – is that polluters should not have a presumptive right to treat the atmosphere as a private dumping ground.[14]

In the broad universe of commons, these types of government-engineered commons are exceptional. The more familiar and pervasive types of commons are socially based and relatively small – although the Internet is increasingly the site of all sorts of innovative experiments in self-organized mass collaborations, as exemplified by Wikipedia. Most commons are less about bureaucratic systems than smaller-scale social governance. Members of distinct communities know and respect the resources that they manage, and their management

13 See for instance: NARRAIN, Sunita: When markets do work for people.

14 BARNES, Peter: Who owns the sky? Our common assets and the future of capitalism. Island Press, 2001.

tends to be more accountable.

Indigenous peoples, for example, regard their knowledge of local flora and fauna, and medicinal treatments derived from them, as a community possession, not a marketable commodity. Their "traditional knowledge" helps define who they are as people. Therefore, maintaining the integrity of the commons is the same as maintaining the integrity of their social relationships, values and identity. Money cannot substitute for them. Which is why indigenous peoples are properly suspicious of dealings with large pharmaceutical companies and oil companies; they understand that any wealth generated through the market could well subvert their other, important forms of "common wealth."

The Commons as a Sector of Wealth-Creation

The full scope of the commons sector is only beginning to be studied. One reason is the alarming number of enclosures underway. Another reason is the growing realization that socially based commons do not necessarily result in a "tragedy," but indeed, can be highly generative. A commons can often create value – economic, social, personal – in ways that market regimes cannot.

This is most readily seen on the Internet, where "commons-based peer production," in Professor Yochai Benkler's analysis, is proving to be a more efficient and creative mode of generating value than conventional corporate organization.[15] The rise of GNU/Linux, the open-source operating system, is a frequently cited example of this phenomenon. Managing natural resources as commons may also generate greater value over the long term than markets because a well-designed commons is more likely to internalize pollution and take a long-term perspective.

A great deal more study is needed to give us a better understanding of the many commons around us. But it is abundantly clear that the commons offers a range of wealth-creating, resource-protecting solutions that government and markets simply cannot provide. The chapters of this book explore some of the complex issues raised by the commons and how they are unfolding in Europe and elsewhere.

15 BENKLER, Yochai: Coase's Penguin, or Linux and the Nature of the Firm. 112 *Yale Law Journal* 369 (2002). available at http://www.benkler.org. See also BENKLER: The Wealth of Networks. New Haven, Connecticut. Yale University Press. 2006.

The four realms of the commons

Antonio Lafuente[1]

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This text is an initial effort to characterize and visualize the plural and elusive world of the commons.

As I have become more submerged in the subject matter, I have been moving away from the strong tie generally established in the bibliography between "commons" and "property," so as to recognize the many ties with the notion of community. However you look at it, it is impossible to avoid the obvious: the commons sustain and are sustained by human communities. So we exit the world of economics, and get into the world of anthropology, which is also equivalent to making the transition from an ethic of values to an ethic of capacities, for a common good is no more than a successful strategy for building capacities for a human community. It will surprise no one, therefore, that I speak of shared goods whose circulation is regulated by the economy of the gift.[2] I also wish to highlight the historical nature of common goods, which suggests that the commons are not an objective fact, but rather the fruit of a political decision necessarily tied to the surrounding technologies.

If one considers the pollination of plants as a common good, the question arises as to whether it could be otherwise. And indeed it could be otherwise. In fact, no one thinks about the orbit of the planet Earth until someone has the technology to modify it, and then it will have to be declared a common good. And what about sensation? We refer to the capacity to experience enjoyment when observing a painting or a landscape. Or pain in the face of the disease or disgrace of others. If we believe pollination is a natural phenomenon comparable, say, to the laws of universal gravity, or that the electrobiochemical principles that regulate the myriad neuronal interactions are autonomous and not reprogrammable, we may be very mistaken.

New technologies can alter, directly or indirectly, the system by which bees are guided, or the operation of the human brain, to the extreme that we reach the point of considering that a good that we thought could not be depleted or appropriated is endangered, as is happening with the air, mathematics, the streets, or folklore. There is, in effect, a profound relationship between the new technologies and the new patrimonies, for every day new possibilities appear for fencing in or abusing a good that we only begin to value once it begins to be threatened. If a company can cast the garbage it produces into the seas or the atmosphere and save itself the costs of non-polluting production, or if someone discovers how to modify the genes of a species and patent new life forms, then humanity as a whole has the right to feel threatened and to claim the status of commons for the air we breathe and the genome that biochemistry, time, and chance have

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[1] The author is a coordinator at the MediaLab-Prado (Madrid) of the Laboratorio del Procomún, works at the Centro de Ciencias Humanas y Sociales (CSIC) in the History of Science Department.

[2] BENKLER, Yochai: *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press. 2006. http://www.benkler.org/wealth_of_networks/index.php/Download_PDFs_of_the_book

bequeathed us.

Communities are then communities of persons affected who mobilize so as not to renounce the capacities that enabled its members to fully exercise their status as citizens or even as living beings. If the ethics of values helps us understand the movements that are leading to the formation of a third sector of the economy, the ethics of capacities allows us to understand which policies and actions to undertake.[3]

The formation of this third sector as a kind of coalition of empowered communities of affected persons clashes directly with the difficulty bringing together and visualizing common goods. It is an extremely diverse object, both if we think of the different scales on which it can emerge (neighborhood, local, national, regional, or global), and if we stop to consider the plurality of ways of managing it, actors involved, legal regimes affected, or technologies needed to sustain it. Admitting that such diversity should not be seen as a problem, but, to the contrary, as a characteristic feature of the cornucopia of common goods, we don't want to renounce the attempt to offer an image that depicts them as a colorful tapestry of remnants, a mosaic that depicts and sustains abundance and diversity.

To construct the tapestry we have drawn on the notion of realm proposed some years ago by Javier Echeverría[4] to fit the human into the world of the new information and communication technologies (ICTs), understood as a technical system which, in addition to assembling a constellation of technologies, constitutes a social system to which we have to learn to adapt. And certainly this so-called third realm, an emerging property of the system of ICTs, has come to have such a decisive presence in our lives as to merit anthropological treatment comparable to that which has been given to two other great human adaptations in history: that which has enabled the human being to develop in relation to territory (the environment), and that bound human beings more closely to other persons (the city).

The fourth realm is the one that we would like to suggest as essential for understanding how that which is human has unfolded over time: the body, which cannot be reduced to the laws of nature or morality, and always resistant to the many efforts to turn it into a theological, legal, medical, statistical, or, generically, biopolitical abstraction. The body is not only a unique machinery capable of processing huge quantities of information, digesting food, capturing external light or sound, not to mention all the forms of extracting, modifying, storing, transporting, and exuding data and structures. It is neither nature nor culture, but another realm to which one must refer and in which to contrast what happens (to us). Clearly, it is the sensor that alerts to the existence of contaminating substances or other threats to its integrity, without being a machine that responds in all humans homogenously or unanimously, even when we are talking about bodies extended or mediated by technology.[5] Its specificity is a scandal, a strategic place open to contingencies, resistant to formalization of any type, and always threatened by the many norms, prohibitions, and discourses that attempt to contain its impossible-to-encompass reality, which they seek to disembody.[6]

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[3] See also: NUSSBAUM, Martha: *Las fronteras de la justicia. Consideraciones sobre la exclusión*. Barcelona. Paidós. 2007. See also: SEN, Amartya: *Bienestar, justicia y mercado*. Barcelona. Paidós. 1998.

[4] ECHEVERRÍA, Javier: *Los señores del aire y el Tercer Entorno*. Barcelona: Destino. 1999.

[5] IHDE, Don: *Los cuerpos en la tecnología*. Barcelona, UOC. 2004.

[6] VAL, Jaime del: "Cuerpos frontera. Imperios y resistencias en el pos-postmodernismo." In: *Organicidades* (UOC), Artnodes, No. 6. 2006. http://www.uoc.edu/artnodes/6/dt/esp/val.pdf

If life has unfolded in the four realms mentioned, it will also be necessary to defend, in each one, a set of common goods that guarantees their sustenance within certain minimal margins of dignity and liberty. With a desire to be concrete, and recognizing the different levels of complexity that structure the commons in each realm, we have put together a colorful conceptual tapestry which in its simplest version has the following aspects:

body	**environment**	**city**	**digital**
sensitivity corporality	biosphere geosphere	domestic cultural urban	code structures

Of the four realms, the environment is the most obvious. Yet the fact that it is easy to admit our extreme dependence on the environment does not mean that agreements for managing it are reached with greater celerity. The major polemics that we continue to be engaged in as to the impact of radioactive waste or growing emissions of greenhouse gases describe a long road that lies ahead. When we speak of climate, jungles, outer space, or photosynthesis we perceive the profound dependence of these commons on the new technologies. It is difficult not to see science and technology as the most powerful mechanisms for the fragmentation, modularization, and commodification of nature. Indeed, many goods that were considered inexhaustible have begun to be threatened and to be subtractable, that is, depletable, and, as Elinor Ostrom explained, it is also extremely costly to restrict free access or use from free-riders.[7]

With the chart in view, one can see the machine-like structure of human life, i.e. the automatisms we depend on for things to work. Yet there is something that cannot be captured in a flow chart and that has to do with the interactions among people, distinct from those that take place between human and non-human actors.[8] This informal aspect of relationships, proliferative and quotidian, of low intensity and high density, and which is essential for things to work, should be valued and considered as a common good constructed by us all which, accordingly, does not belong to those at the top or to any committee of representatives. Of course it does not operate as an instance of power (which can always be captured and integrated into the chart), but as part of that which is common, of the common capacity.[9]

These considerations have been framed after having made the decision to produce an image capable of containing the essential elements of the debate on common goods as a whole. And, of course, the chart we present aspires to show in one glance the extraordinary complexity of the matter. Creating an image is not an operation without risk, and implies at least two delicate

[7] OSTROM, Elinor: *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press. 1990.

[8] DELGADO, Manuel: *Sociedades movedizas. Pasos hacia una antropología de las calles*. Barcelona. Anagrama. 2007.

[9] RANCIÈRE, Jacques: *El odio a la democracia*. Buenos Aires. Amorrortu. 2007.s

decisions: first, assuming that the commons can be made visible as an external and abstract entity, apart from the communities and conflicts in which it is enveloped; second, expanding the profoundly technological nature of the commons. Sharing an image of something requires a chain of mobilizations that include processes of fragmentation, modulation, simulation, and inscription in one or several media, from books to the Internet, including academic networks or those associated with public opinion. And yes, we do it to give new legitimacy to the claims concerning the commons, without concealing the extreme complexity of the actors involved. Not in vain, getting to know something has always been an operation that has much to do with enlightening, unveiling, discovering, and, clearly, showing. In the scopic regime, characteristic of knowledge in modernity, only that which is visible can be credible.

Commons and citizenship: The contradictions of an unfolding relationship

José Esteban Castro[1]
Newcastle University

"Two social tendencies resting upon entirely heterogeneous bases thus wrestle with each other. The old economic order asked: How can I give, on this piece of land, work and sustenance to the greatest possible number of men? Capitalism asks: From this piece of land how can I produce as many crops as possible for the market with as few men as possible? […] Capitalism extracts produce from the land, from the mines, foundries, and machine industries. The thousands of years of the past struggle against the invasion of the capitalist spirit.

Max Weber, Essays in Sociology

"From the standpoint of a higher socio-economic formation, the private property of particular individuals in the earth will appear just as absurd as the private property of one man in other men. Even an entire society, a nation, or all simultaneously existing societies taken together, are not owners of the earth.

Karl Marx, Capital, Vol. 3.

This article aims at contributing to the ongoing debate about the "commons" by exploring the emancipatory potential of contemporary struggles for the defense and reclaiming of common goods in connection with the development of substantive, not merely formal, citizenship. For the sake of clarity I have organized the discussion around three main propositions:

Proposition 1: The principles of citizenship as developed in capitalist democracies tend to fall into contradiction with the principles associated with the existence of the commons.

Proposition 2: In the short and midterm the substantive, not merely formal, exercise of existing forms of citizenship may contribute towards the defense and the reclaiming of the commons.

Proposition 3: The successful defense and reclaiming of the commons at a global scale may contribute to the unfolding of new social forms that transcend the limits imposed by existing citizenship systems.

The propositions and the ensuing discussion are based on assumptions that need to be made explicit before we proceed. Firstly, although we deal here with a somewhat abstract notion of

[1] The author is Senior Lecturer in Sociology at the School of Geography, Politics and Sociology, Newcastle University, United Kingdom

the "commons",[2] our reflection is grounded on empirical research on one particular type of "commons": the social and political arrangements characterizing the control and management of freshwater as a common good. Our recent work has addressed different aspects of freshwater management and governance, including the development of citizenship in relation to water control. This research informs much of our arguments in this chapter.[3] For the same reason, most of the examples and references made relate to cases from Latin America, although the lessons extracted cast light on similar processes elsewhere. Secondly, although we focus on defending and reclaiming the commons as a counter hegemonic project, we are aware that not all "commons" are necessarily conducive to substantive democracy and emancipatory politics and that certain projects carried out under the banner of "managing the commons" may actually be the vehicles of primitive accumulation, further expropriation and enclosure of the commons, and thus worsening social exclusion.[4] Thirdly, we address here "citizenship" from a sociological perspective that places more emphasis on process than status. Citizenship is, primarily, a system of inclusion-exclusion that operates on the basis of specific criteria to define the membership of individuals in a given political community, including the allocation of the members' rights and duties. This is a highly dynamic process, as citizenship evolves over time in qualitative and quantitative terms, adopting a diversity of forms in different territories, and being characterized by ongoing contradictions between the formal status bestowed on individual citizens and the actual, substantive exercise of rights and duties allowed to them in practical terms. Summing up, we are not concerned here with the connection between citizenship and nationality or other forms of political identity, but rather focus on citizenship as a set of social relationships grounded on the recognition of mutual rights and duties among formally equal members of society, and the tensions arising from the contradictions between this abstract equality of formal status and the actual social asymmetries and inequalities characterizing real human beings.

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2 For a detailed treatment of the different concrete forms of "common" property regimes, see the article by BOLLIER, David in this book.

3 CASTRO, José E. (2006). Water, Power, and Citizenship. Social Struggle in the Basin of Mexico. Houndmills, Basingstoke and New York, Palgrave-Macmillan; CASTRO, José E. and Miguel LACABANA (2005). "Agua y desarrollo en América Latina: por una democracia sustantiva en la gestión del agua y sus servicios." Cuadernos del Cendes 22(59): ix-xv.

4 GOLDMAN, Michael (1997). ""Customs in Common": The Epistemic World of the Commons Scholars." Theory and Society 26(1): 1-37. Also, MCCARTHY, JAMES (2005). "Commons as counterhegemonic projects." Capitalism Nature Socialism 16(1): 9-24.

Proposition 1: The principles of citizenship as developed in capitalist democracies tend to fall into contradiction with the principles associated with the existence of the commons.

The principles and institutions characterizing the prevailing models of citizenship are, broadly speaking, the historically-specific product of Western societies. It can be said, by analogy with Herman Heller's classical characterization of the modern nation state, that the development of modern forms of citizenship has been a process circumscribed to the "Western circle of nations".[5] This does not mean that some of the components of modern citizenship systems cannot be found in other societies, but the point here is that the main principles and institutions that are the hallmark of currently prevailing forms of citizenship (particularly civil and political rights and duties) have been largely the result of developments in Western societies and their adaptation to, adoption by, or imposition on other societies, particularly since the eighteenth century. More importantly, it means that similarly to the case of other western concepts, "citizenship" should not be mechanically applied to other societies without carefully examining the implications.

Closely related to the previous point, the formation and expansion of modern citizenship systems is part and parcel of the development of capitalist democracy. In particular, citizenship is at the centre of the crucial contradiction between formal equality and, the actual conditions of inequality that structure capitalist democracies. As suggested long ago by T H Marshall, citizenship in capitalist democracy provides the basis of formal equality on which the structural socio-economic inequalities that characterize capitalism can be sustained.[6] In this sense, in contemporary society the system of citizenship is instrumental to the reproduction and expansion of capitalism. This is highly relevant to our discussion, because the most formidable process of commons encroachment takes place through the expansion of capitalist forms of social organization, and particularly through the commodification process. Not only these processes are not incompatible with the prevailing forms of citizenship, but in fact the institutions of citizenship themselves may foster the colonization of the commons by capitalist forms of property and management.

From another angle, the long-term evolution of western citizenship has been characterized overall by qualitative and quantitative expansion, but this expansion has been uneven and also subject to regressive tendencies. Broadly speaking, in modern times being a citizen evolved from being a burgher (a male head of family, property owner) in medieval European cities ,[7] to becoming an individual (still male, property owner) member of a nation state towards the end of the eighteenth century with the French Revolution. Subsequently, ever more inclusive forms of (nation-state-bound) citizenship developed, particularly during the nineteenth and twentieth centuries, which included the formal expansion of citizenship to women and to the majority of non-property owners (still excluding large sectors of the population, often on ethnic grounds). More recently we have been witnessing the re-appearance of old and the emergence of new forms of citizenship that tend to transcend the boundaries of nation states, such as in the case of "post-national", "transnational", "cosmopolitan", "world", or "global" citizenship.[8] Thus, in a

5 HELLER, Hermann (1987). Teoría del Estado. Mexico City, Fondo de Cultura Económica, pp. 43, 78.

6 MARSHALL, Thomas H. (1963). Citizenship and social class. Sociology at the Crossroads and other Essays. T. H. Marshall. London, Heinemann: 67-127.

7 WEBER, Max (1978). Economy and Society. Berkeley, Los Angeles, London, University of California Press, p. 1243.

8 For a summary of this debate, see for instance THEORY AND SOCIETY (1997). "Special

long-term perspective it can be said that as an overall pattern the formal membership of citizenship systems has been continuously expanded to incorporate, borrowing from Norbert Elias, "ever greater numbers" of human beings.[9] Moreover, in more recent times debates about citizenship increasingly involve the consideration of extending the membership also to non humans, whether it is animals[10] or even artificial life.[11]

This evolution has also a qualitative dimension given that the contents of citizenship, in particular the kinds of rights and duties involved in its exercise have also evolved in width and depth. Thus, the traditional basic components of citizenship, the civil and political dimensions, were expanded during the twentieth century with the incorporation of the social dimension consolidated during the post-Second World War period. Since the last decades of the twentieth century there has been a rapid transformation of the contents of citizenship, mostly through the further specification of the meaning and scope of rights and duties, but also moving beyond classical anthropocentric concerns through the incorporation of whole new areas such as ecological,[12] green (humans as stewards of the global commons),[13] or post-human, technological (cyborg) citizenship.[14]

However, this has been neither a linear nor uniform progress, and the historical development of citizenship has been rather punctuated by recurrent social struggles and has been also subject to significant setbacks where rights acquired during favorable periods have been be suspended or cancelled altogether. This can be illustrated, most notably, with the cancellation of basic civil rights such as the habeas corpus by both capitalist dictatorships[15] and democracies[16] or by the substantial reduction and even cancellation of social rights through the neoliberal reforms implemented worldwide since the 1980s.[17] Moreover, it is well established that even in the most traditional capitalist democracies the actual exercise of citizenship is highly uneven, and therefore we have to distinguish between formal and substantive citizenship as well as between the social asymmetries expressed in the actual development of different citizen hierarchies (first, second and even third class citizens, non citizens, and so on) to take these nuances into account. Class, gender, and ethnic inequalities determine that for large sectors of the population in capitalist democracies citizenship is mainly a formality that has limited impact on their daily lives.

Issue on Recasting Citizenship " Theory and Society 26(4). Also, DELANTY, Gerard (2000). Citizenship in a global age: society, culture, politics. Philadelphia, PA, Open University Press.

9 ELIAS, Norbert (1994). The Civilizing Process. The History of Manners, and State Formation and Civilization. Oxford, Basil Blackwell, p. 354.

10 GOODIN, Robert E., Carole PATEMAN, and Roy PATERMAN (1997). "Simian Sovereignty." Political Theory 25(6): 821-849.

11 IPSOS-MORI (2006) "Robo-rights: Utopian dream or rise of the machines?", London, Office of Science and Innovation's Horizon Scanning Centre, United Kingdom Government.

12 STEENBERGEN, Bart v. (1994). Towards a global ecological citizen. The Condition of citizenship. Bart. v. STEENBERGEN. London, Thousand Oaks, Calif., Sage: 141-152.

13 NEWBY, Howard (1996). Citizenship in a green world: global commons and human stewardship. Citizenship Today. The Contemporary relevance of T. H. Marshall. Martin BULMER and Anthony M. REES. London, UCL Press: 209-221.

14 GRAY, Chris H. (2001). Cyborg citizen : politics in the posthuman age. New York, London, Routledge.

15 MARÍN, Juan C. (1996). Los Hechos Armados. Argentina 1973-1976. La Acumulación Primitiva del Genocidio. Buenos Aires, PICASO - La Rosa Blindada.

16 MORRISON, Trevor W. (2007). "Suspensions and the extrajudicial constitution." Columbia Law Review 107(7): 1533-1616.

17 LEYS, Colin (2001). Market-driven politics: neoliberal democracy and the public interest. London, Verso; HARVEY, David (2005). A brief history of neoliberalism. Oxford, Oxford University Press.

Also, there exist different models of citizenship within the Western experience which draw on and reproduce rival intellectual and political traditions.[18] Moreover, the particular institutions of citizenship derived from these models tend to diverge, often sharply, between different national and regional political cultures. The institutions of citizenship prevailing in Nordic Europe have followed a very different pattern from the rest of the continent,[19] while the differences between West and South and between Anglo Saxon and continental Europe are also significant.[20] Likewise, there are fundamental differences between the European institutions of citizenship and those that were developed in the United States.[21]

Understandably, applying mechanically the notion of citizenship to the experiences of non European countries is even more problematic. For instance, what does it mean to be a citizen in Latin America, or rather in each of its countries and regions? Some authors have argued that the case of Latin American countries is one of "states without citizens", where the development of nation states was not corresponded with the formation of a citizenry that could provide a legitimate basis for the exercise of political power.[22] Still others have written about "imaginary citizens", thus referring to the limitations of the often artificial attempts to transplant the liberal institutions of citizenship (and particularly private property) in countries like Mexico, which had well-established indigenous and Hispanic traditions of collective ownership of natural assets (land, water, forest).[23] In fact, what does it mean in practice to be a citizen, for instance, for the large proportion of indigenous population in countries like Bolivia, Brazil, Ecuador, Guatemala, Mexico or Peru (but also for the smaller proportions of indigenous and non-white people composing the population of most countries in the region)? Moreover, even where in principle the conditions for the exercise of citizenship had experienced some degree of development, like for instance in the countries of the Southern Cone, decades of dictatorship followed by the neoliberal reforms implemented since the 1980s have significantly worsened those conditions as clearly illustrated by the re-emergence of an "exclusionary society" in countries like Argentina[24] and Chile.[25]

Citizenship and the commons: the contradictions

The prevailing forms of institutionalized citizenship are integral to capitalist democracy and have developed in intimate correspondence with the other key structural components of the capitalist system. Thus, the unfolding process of citizenship has been closely bound with the

18 DELANTY, op cit.

19 ESPING-ANDERSEN, Gøsta (1990). The three worlds of welfare capitalism. Princeton, N.J., Princeton University Press; KAUTTO, Mikko, Johan FRITZELL, Bjørn HVINDEN, Jon KVIST, and Hannu UUSITALO, Eds. (2001). Nordic Welfare States in the European Context. London and New York, Routledge.

20 BRUBAKER, Rogers (1992). Citizenship and Nationhood in France and Germany. Cambridge, Mass. and London, Harvard University Press; STEENBERGEN, op. cit.

21 GLENN, Evelyn (2000). "Citizenship and Inequality: Historical and Global Perspectives." Social Problems 47(1): 1-20.

22 FLEURY, Sonia (1997). Estados sin Ciudadanos. Seguridad Social en América Latina. Buenos Aires, Lugar Editorial.

23 ESCALANTE GONZALBO, Fernando (1992). Ciudadanos Imaginarios. Mexico City, El Colegio de México.

24 SVAMPA, Maristella (2005). La Sociedad Excluyente. La Argentina bajo el Signo del Neoliberalismo. Buenos Aires, Taurus.

25 LATIN AMERICAN PERSPECTIVES (2003). "Chile since 1990: The Contradictions of Neoliberal Democratization (Special Issue, Part 1)." Latin American Perspectives 30(5).

development of capitalist social relations construed around the pivotal element of capitalist society: the commodity and the corresponding process of commodification that continues its expansion into ever newer terrains.[26] In this connection, commodification is a long-term process by which relations between human beings are increasingly mediated and transformed by the logic of production and circulation of commodities, a process grounded on the private –not common– appropriation of nature. The development of currently prevailing citizenship systems centred on individual rights has not only been instrumental to such process, but it has actually been inextricable part of it. This relationship between the principles of citizenship and capitalism is more transparent in the liberal-individualist tradition of citizenship, which is predicated on the assumption that individuals are primarily maximizers of their own personal benefit, whose rational individual choices eventually deliver the best possible social outcomes if the appropriate conditions (e.g. private property) are present. These assumptions are familiar in debates about the commons, as they underpin a number of influential arguments that range from Garret Hardin's "Tragedy of the commons"[27] and the neoinstitutionalists North and Thomas' claim that common property is an anachronistic legacy of a bygone era when resources were plentiful,[28] to the extreme neoliberal positions that strive to replace the commons with private property as the key solution to the crisis of natural "resources".[29] From this perspective, the prevailing forms of citizenship are in principle antagonistic to the very existence of the commons and it could be argued that the logic of the progress of citizenship in capitalist democracies implies in the long run the demise of social relationships predicated on common forms of property and their replacement with private property relations and institutions.

Proposition 2: In the short and midterm the substantive, not merely formal, exercise of existing forms of citizenship may contribute towards the defense and the reclaiming of the commons.

Notwithstanding the instrumental aspect of citizenship in the context of capitalist democracy, as discussed above, the historical development of citizenship has been neither monolithic nor linear. It has been rather characterized by divergence, diversity, and ongoing contradictions with the capitalist logic. In the words of T H Marshall, from a certain perspective, the principles of citizenship and capitalism have also been "at war", in particular because while capitalism is predicated on the production and reproduction of social inequalities the principles of citizenship are grounded on notions of universal equality and its enhancement can potentially bring about the abatement of qualitative structural inequalities.[30] Moreover, the quantitative and qualitative expansion of citizenship over time has also incorporated the embryonic forms of potentially emancipatory forms of social organization that, among other issues, may foster the defense and reclaiming of the commons. Borrowing from Marx, the exercise of citizenship may constitute "the final form of human emancipation within the hitherto existing world order".[31] Let us

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26 See the article by MOONEY, Pat in this book.

27 HARDIN, Garret (1968). "The Tragedy of the Commons." Science 162(3859): 1243-1248. For a critique of Hardin's argument, see the article by LERCH, Achim, in this book.

28 NORTH, Douglass C. and Robert P. THOMAS (1973). The rise of the Western world: a new economic history. Cambridge, Cambridge University Press.

29 SMITH, Robert J. (1981). "Resolving the tragedy of the commons by creating private property rights in wildlife." The CATO Journal 1(2): 439-468.

30 MARSHALL, op. cit.

31 MARX, Karl (1975). On the Jewish Question. Collected Works. Karl MARX and Friedrich ENGELS. London, Lawrence and Wishart. 3: 146-74.

explore some aspects of this short-term emancipatory potential of citizenship.

The basic components of citizenship in capitalist democracy concern the civil and political dimensions, basically the rights and duties involved in owning property, having judicial protection, and participating in political life. Over time, these have been extended to incorporate social rights (admittedly a controversial topic, as for free-market liberals citizenship is mostly limited to the civil and political dimension). Although these rights and duties are primarily allocated to individuals, the actual implications of the substantive exercise of such rights and duties go well beyond the individual sphere. For instance, while in relation to certain uses of freshwater the ownership of this element is allocated to private actors, such as has been often the case with underground water rights, in the case of urban uses water rights are normally in the hands of collective actors such as municipalities or provincial and national governments. In many cases these rights consist in abstraction permits granted by the state, but sometimes they may resemble a de facto property right over water, which may have been acquired in conjunction with land rights. Whatever the case, the actual exercise of the rights and duties derived from water rights in the hands of collectives like cities or metropolitan regions can be considered to be part and parcel of the rights of citizenship available to the relevant population.

In this connection, and remaining just in the sphere of civil and political rights, a number of questions arise. What kind of citizenship rights and duties are involved in the control, government and allocation of water in urban areas? Is this information available to urban dwellers? How do they actually exercise these rights and duties? The bottom line question regarding water-related civil rights would be: who owns the water? Do urban dwellers own the water (even if this ownership is formally in the hands of their local government institutions)? How is this ownership exercised? What institutions and (juridical and administrative) mechanisms are available for the exercise of the relevant rights and duties? Then, moving to the political dimension, how do citizens participate in the relevant political decisions related to the control, government and allocation of water in their cities? How are political decisions about water (e.g. about deciding if urban water services should be provided as a public good or as a commercialized, even privatized service) taken? Who takes the decisions? Are the decision makers elected by the citizens? What mechanisms are available to the citizens for challenging the decisions and practices of water policy makers and implementors? What are the instruments that help citizens to become aware of their own responsibilities as stewards of freshwater and other commons?

The answer to these and other related questions is that, in historical perspective, citizens have been precluded from actually exercising their rights because the decisions about the allocation and overall management of water in cities has been largely the preserve of, borrowing from Dryzek, the "administrative rationalism" of water bureaucracies.[32] This applies to much of twentieth-century water policies, but also to more recent policy decisions implemented under the banner of "citizen participation", empowerment, and "privatization", which in fact continue to ignore –if not altogether cancel– the rights of the population in relation to the control of water in their cities and regions.

An examination of the key decisions taken worldwide in relation to water since the 1980s shows a clear pattern whereby the majority of water users have been systematically excluded or even prevented from exercising their citizenship rights, not just in the much publicized cases of

[32] DRYZEK, John S. (1997). The Politics of the Earth. Environmental Discourses. Oxford, Oxford University Press

privatization of urban water and sanitation services, but also in a wider range of water policies from the creation of "markets" for water resources to the construction of large hydraulic infrastructures like dams, river transfers, or hydroways, which affect the livelihoods of millions of human beings. As a matter of fact, water-related policy decisions are usually taken with almost complete disregard for the opinion, values, and material interests of the majority of water users and citizens, even when they are oriented at providing effective solutions to problems such as food security, disaster protection, or underdevelopment.

This is the overall pattern, and it is not uplifting. However, at the same time, and as shown by mounting empirical evidence from recent and ongoing social struggles over freshwater and other commons, the attempt to transform merely formal citizenship entitlements through the substantive exercise of civil, political and social rights has a formidable emancipatory potential. Whether it is through direct action as it actually happened in the now world-famous Bolivian water wars that brought about the cancellation of privatization projects in Cochabamba (2000) and La Paz-El Alto (2006)[33] or through more nuanced political confrontations like in the 2004 Uruguayan plebiscite that led to the banning of water privatization in the national constitution,[34] water users have not been passive victims of exclusionary citizenship practices and authoritarian decision making.

Social and political forces that have stemmed from struggles against authoritarian rule and dictatorship are making inroads in the development of innovative forms of substantive citizenship that have already demonstrated the potential for democratization in the management of common goods. These include the also world-known example of participatory budgeting in Porto Alegre and other Brazilian municipalities,[35] which has been replicated with significant success in other Latin American and European cities. Another example is provided by the Community Water Boards in Venezuela, which place the emphasis on promoting the involvement of citizens in decision making at the local level.[36]

The examples can be easily multiplied with reference to the widespread struggles for environmental justice being waged worldwide to protect or reclaim the commons from both state- and market-led capitalist encroachment.[37] These processes provide excellent examples of how existing forms of citizenship can eventually be turned into vehicles for radical change in the struggle to defend the common good. In fact, the potential for deepening the exercise of citizenship in this regard is significant, not least because closing the enormous gap between formal and substantive citizenship is already a major task ahead in the democratization process.

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33 LAURIE, Nina and Carlos CRESPO (2007). "Deconstructing the best case scenario: lessons from water politics in La Paz-El Alto, Bolivia." Geoforum 38(5): 841-854.

34 SANTOS, Carlos and Alberto VILLARREAL (2005). Uruguay: direct democracy in defence of the right to water. Reclaiming Public Water. Achievements, Struggles and Visions from Around the World. Belén BALANYÁ, Brid BRENNAN, Olivier HOEDEMAN, Satoko KISHIMOTO and Philipp TERHORST. London, Transnational Institute and Corporate Europe Observatory: 173-179.

35 DUTRA, Olivio and Maria V. Benevides (2001). Orçamento participativo e socialismo, Perseu Abramo; MALTZ, Hélio (2005). Porto Alegre's water: public and for all. In BALANYÁ, et. al., op. cit.: 29-36; MIRANDA NETO, Antonio (2005). Recife, Brazil: building up water and sanitation services through citizenship. In BALANYÁ, et. al., op. cit.: 113-119.

36 ARCONADA, Santiago (2005). "Seis años después: mesas técnicas y consejos comunitarios de agua (aportes para un balance de la experiencia desarrollada)." Revista Venezolana de Economía y Ciencias Sociales 11(3): 187-203.

37 See, for instance, GOLDMAN, Michael, Ed. (1998). Privatizing Nature: Political Struggles for the Global Commons. London, Pluto Press; MARTINEZ-ALIER, Joan (2002). The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation. Cheltenham, UK and Northampton, MA., Edward Elgar.

Proposition 3: The successful defense and reclaiming of the commons at a global scale may contribute to the unfolding of new social forms that transcend the limits imposed by existing citizenship systems.

Unleashing the emancipatory potential available through the exercise of substantive citizenship, as Marx suggested, is certainly a desirable course of action to preserve and reclaim the commons. However, we can neither take for granted the replicability of successful experiences nor their sustainability, given that the conditions for the exercise of citizenship are highly uneven, in unstable equilibrium, and ultimately determined by the logic and constraints of capitalist democracy. After all, capitalism is driven by the commodification process, which is in principle incompatible with the subsistence of the commons. However, this is neither a necessary nor teleological process, and despite the privatization thrust of contemporary neoliberal capitalism the obstacles to the further commodification of the commons are significant.[38] This leaves ample room for counter hegemonic projects aimed at preserving and reclaiming existing commons and developing new ones.

There are, though, alternative possibilities and scenarios, some of which present us with a difficult dilemma in relation to the future of both the commons and citizenship. On the one hand, as already said, the progress of unbridled capitalist encroachment of the commons is not incompatible with prevailing forms of citizenship. Moreover, the currently dominant forms of capitalist democracy based on formal representation are predicated on the exclusion of most citizens from the public sphere, as the latter is considered to be a preserve of experts and professional politicians. This prevailing model of restricted citizenship has been strengthened in the last few decades, alongside the accelerated expansion of commons enclosures, which increasingly extends to the global commons such as the oceans and the atmosphere. On the other hand, the social struggles over the commons taking place globally tend to be associated with those forms of citizenship which place greater emphasis on direct participation by the citizens in crucial debates and decisions. An example, and another world-known case, has been the struggle of the Mexican Zapatistas who based their 1993 opening "war" declaration on Article 39 of their country's Constitution and stated that one of their key objectives was "to suspend the plundering of our natural wealth".[39] It can be said, hoping not to misinterpret the Zapatistas, that their struggle is both for achieving substantive citizenship (as a bottom line, to achieve the recognition of the indigenous population as full citizens in their country, and the actual participation of all Mexican citizens in their country's public affairs) and protecting and reclaiming the commons.

In perspective, and as the experience of the Zapatistas and many other actors tends to suggest, the successful defense and reclaiming of the commons is likely to lead to (and in fact also require) the unfolding of new social relations that may supersede the currently prevailing forms and institutions of citizenship. To some extent, this potential and largely unintended outcome of the human struggle for substantive democratization was already anticipated by Marx, who stated that

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38 HEYNEN, Nik and Paul Robbins (2005). "The neoliberalization of nature: Governance, privatization, enclosure and valuation." Capitalism Nature Socialism 16(1): 5 - 8.

39 COMANDO GENERAL DEL EJÉRCITO ZAPATISTA DE LIBERACIÓN NACIONAL (EZLN) (1994). Declaración de la Selva Lacandona EZLN Documentos y Comunicados. Antonio G. d. LEÓN, Elena PONIATOWSKA and Carlos MONSIVÁIS. Mexico City, Ediciones Era: 33-35.

"Only when the real, individual man re-absorbs in himself the abstract citizen, and as an individual human being has become a species-being in his everyday life, in his particular work, and in his particular situation, only when man has recognized and organized his own forces as social forces, and consequently no longer separates social power from himself in the shape of political power, only then will human emancipation have been accomplished".[40]

There is no certainty that human emancipation thus defined will be achieved, not any time soon at least to judge by the increasing alienation of common citizens caused by hegemonic neoliberal globalization in recent decades. However, the defense and reclaiming of the commons constitute one of the front lines in the ongoing struggle over the territory of substantive democracy and citizenship. In the process, it can be expected that new social forms will emerge that may help to re-equilibrate the system in a higher level of human organization that privileges intra- and inter-generational cooperation and solidarity over the blind dynamics of competition and the survival of the fittest.

40 MARX, op. cit.: 168.

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E-mail addresses for editorial correspondence: <nicolet@acm.org> and <rfcalvo@ati.es>

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Open Knowledge

Guest Editors: Philippe Aigrain and Jesús M. González-Barahona

Joint issue with NOVÁTICA

3 Presentation. Ownership and Terms of Use for Intangibles. Land Grab or Commons? – *Philippe Aigrain and Jesús M. González-Barahona*

The guest editors present the issue, where they have offered the floor to a very diverse set of contributors, united by the effort to understand and promote information-based commons and convinced that a prosperous and more human economy can develop on its basis. They also provide a list of useful references for those interested in knowing more about this subject.

6 The Political Economy of Commons – *Yochai Benkler*

In this article the author defines the structure of the information commons, its sustainability, and its importance for democracy and for individual freedom.

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24 Petition to the European Parliament on the Proposal for a Directive on the Patentability of Computer-implemented Inventions – *Several European computer scientists and engineers*

Petition written by several prestigious European computer scientists and engineers, related to the proposed Directive on software patents currently being discussed at the European Parliament.

26 The Right to Read – *Richard Stallman*

This is a short fiction story, 45 years ahead, in which the author, by extrapolating from some current trends, shows a future where access to information is tightly controlled, and the so called "trusted computing" is fully deployed.

29 Please, Pirate My Songs! – *Ignacio Escolar*

A musician describes the current situation of the music industry from his specific point of view.

31 The EUCD and the DMCA in 2003: How Legal Protection for Technological Measures is shaping Consumers' and Copyright Owners' Digital Rights – *Gwen Hinze*

This paper reviews the United States' experience under the Digital Millennium Copyright Act and contends that Member States' implementation legislation should include exceptions permitting circumvention for lawful uses and socially valuable activities. It also analyses a new technological protection regime contemplated by the 2003 draft of the European Union.

35 'Trusted Computing' and Competition Policy – Issues for Computing Professionals – *Ross Anderson*

In this paper, the author gives an outline of Trusted Computig and sketches some of the possible effects on the computing business and the people who work in it.

42 Software Patentability and CEPIS – *Upgrade Editor's Contribution*

The Editor of Upgrade introduces and publishes the positions on software patents put forward by two CEPIS member societies – GI, Germany, and ATI, Spain.

The Political Economy of Commons

Yochai Benkler

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The paper defines the institutional and normative characteristic of commons, and explains why they are sustainable under many circumstances. It explains why maintaining a core common infrastructure in resources necessary for information production and exchange throughout the information environment is important both for democracy and for individual freedom. It concludes by outlining a series of practical policy actions necessary to build such a core common infrastructure.

Keywords: autonomy, commons, commons – economic sustainability, commons – institutional characteristics, democracy, information policy.

1 Why Commons?

Commons are institutional spaces, in which we can practice a particular type of freedom – freedom from the constraints we normally accept as necessary preconditions to functional markets.

- Though we often think of 'free markets' as spaces that enable free choice, in fact these are structured relationships intended to elicit a particular datum – the comparative willingness and ability of agents to pay money for resource.
- The most important constraints under-girding markets are those we usually call property. Property is a cluster of background rules that determine
  - what resources each of us has when we come into relations with others
  - what 'having' or 'lacking' a resource allows us to do or refuse to do in relations surrounding resources. These rules impose constraints on who can do what in the domain of actions that require access to resources that are the subjects of property law.
- While a necessary precondition for markets, property law means that choice in markets is itself not free of constraints, but is instead constrained in a particular pattern.
- Commons are institutional spaces where human agents can act free of the particular constraints required for markets.
- This does not mean that commons are anarchic spaces. Purely free action is illusory.
- It means that individuals and groups can use resources governed under different types of constraints than those imposed by property law. These constraints may be social, or physical, or regulatory. They may make individuals more or less free, in some aggregate sense, than do property rules. Whether a commons in fact enhances freedom or harms it then, depends on how the commons is structured, and on how property rights in the resource would have been structured in the absence of a commons.

2 What are Commons?

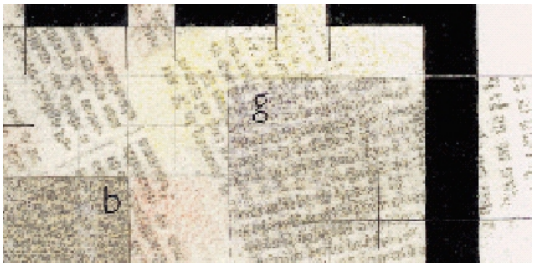
Commons are a particular type of institutional arrangement for governing the use and disposition of resources. Their salient characteristic, which defines them in contradistinction to property, is that no single person has exclusive control over the use and disposition of any particular resource. Instead, resources governed by commons may be used or disposed of by anyone among some (more or less well defined) number of persons, under rules that may range from 'anything goes' to quite crisply articulated formal rules that are effectively enforced.

- Commons can be divided into four types based on two parameters.
- The first parameter is whether they are open to anyone or only to a defined group. The oceans, the air, and highway systems are clear examples of open commons. Various traditional pasture arrangements or irrigation regions are now-classic examples, described by Eleanor Ostrom, of limited-access commons – where access is limited only to members

Yochai Benkler is a Professor of Law at Yale Law School (USA.) Prior to joining Yale, he was a professor at New York University School of Law, where he was the Director of the Engleberg Center for Innovation Law and Policy and of the Information Law Institute. His research focuses on the effect of the interaction of law, technology and economic structures on the organization of information production and exchange, and on the distribution of control over information flows, knowledge, and culture in the digital environment. He has written in particular about the role and sustainability of non-proprietary, or commons-based approaches towards information production and exchange throughout the layers of the digital environment, and on their role in terms of democracy and individual freedom.
<benklery@juris.law.nyu.edu>

of the village or association that collectively "owns" some defined pasturelands or irrigation system. These are better thought of as common property regimes, rather than commons, because they behave as property vis-à-vis the entire world except members of the group who together holds them in common.

- The second parameter is whether a commons system is regulated or unregulated. Practically all well studied limited common property regimes are regulated by more or less elaborate rules – some formal, some social-conventional – governing the use of the resources. Open commons, on the other hand, vary widely. Some commons are governed by no rule. These are called open access commons. Anyone can use resources within these types of commons at will and without payment. Air is such a resource with respect to air intake (breathing, feeding a turbine). Air is, however, a regulated commons with regard to out take. For individual human beings, breathing out is mildly regulated by social convention – you do not breath too heavily on another human being's face unless forced to. Air is a more extensively regulated commons for industrial exhalation – in the shape of pollution controls. The most successful and obvious regulated commons in contemporary landscapes are the sidewalks, streets, roads, and highways that cover our land and form the foundation of our ability to move from one place to the other. The most important resource we govern as an open commons, without which humanity could not be conceived, is all of pre-twentieth century knowledge and culture, most scientific knowledge of the first half of the twentieth century, and much of contemporary science and academic learning.



3 Are Commons Sustainable?

In the late 1960s Garrett Hardin coined an immensely effective trope, *"the tragedy of the commons."* Originally aimed to explain why private incentives would lead to firms to pollute their environment even against their own long term interest, and thereby to justify pollution controls, the trope took on a life of its own. It came to stand for a proposition that all commons are tragic, and that property rights are a necessary precondition to efficient, or even sustainable, resource management. Over the past twenty years or so, we have seen the development of a literature that challenges this now-standard understanding of commons. Most crisply this effort has come to be crystallized in the work of Eleanor Ostrom. A recent review and bibliographic essay by Hess and Ostrom provides an excellent overview of this literature. The crux of most of this work is that there are certain circumstances under which common property regimes are sustainable, and quite possibly more efficient than individual property regimes.

More generally, one can say that commons and property exist on a spectrum of institutional arrangements. Where along this spectrum a resource management system should be so as to be sustainable and efficient depends on technological characteristics of the resource and on patterns of its usage at any given historical moment. Carol Rose early identified that resources that have increasing returns to scale on the demand side, like network externalities, are particularly good candidates for commons. She used this insight to suggest why roads and canals, classic trade instrumentalities, tended to gravitate towards commons models even if they began as private property. Ellickson described a phenomenon in land, whereby the size of the group of owners – from one to many – is a function of the use of land and the likely failures that would have to be dealt with in its management. With regard to information, culture, and communications systems, I have explained how resources necessary for information production and communications systems can be managed as commons in ways that are sustainable and desirable.

Information is a public good in the strict economic sense, and is also input into its own production process. Because of these unusual characteristics, few, if any, economists would argue against the proposition that a substantial commons in information goods is not only sustainable, but indeed is necessary for efficient and innovative information production systems.

Beyond the public goods characteristics of information, the digitally networked environment is also pervaded by resources that, while not public goods in the strict economic sense, nonetheless function well on a commons model. They represent instances where sharing resources in a commons tends to reduce scarcity and perform better than property-based systems. I have written in detail about why wireless communications capacity has this characteristic and why human creativity in large scale, Internet-based collaborations like free software and other peer production enterprises similarly share this characteristic.

The core point across these different domains of resources for information production and communication is that there is some aspect of a resource – like wireless communications capacity, human creativity, distributed processing capacity, distributed storage – that make its clearance through a market particularly clunky, expensive, and inefficient. In those cases, low cost communications and cheap processors that form an integral part of information production and exchange make the conditions ripe for sustainable large-scale collaborations and a sharing of resources based on commons, rather than property-oriented, institutional arrangements.

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4 Why Should we Care?

There are many reasons to care about the extent to which our information environment includes substantial commons. Most commonly spoken of today are concerns of innovation policy. As Lessig has explicated so well, commons throughout the networked environment are necessary to allow innovation to progress without the permission of incumbents who would seek to constrain the path of innovation to fit their own business plans for where technology should go.

But commons in information, culture, and knowledge are not only, or even primarily, a question of innovation. Commons are about freedom. Commons are institutional spaces in which we are free of the constraints imposed by the requirements of markets. When we speak of the information environment, of the cultural and symbolic space we occupy as individuals and citizens, diversification of the constraints under which we operate, including creating spaces relatively free of market-structuring laws, goes to the very heart of freedom and democracy.

The commercial mass media environment has created two effects of central importance to democracy. One may be called *the Berlusconi effect* – the disproportionate political power that ownership over mass media outlets gives its owners or those who can pay them. The other may be called *the Baywatch effect* – the systematic displacement of public discourse by the distribution of commodifiable entertainment products. This same media has also create sophisticated marketing and advertising models intended to shape what each of us sees as we look at the world through mediated glasses, so that our gaze, our wants, our actions are focused on those behaviours that are most easily capable of being translated into consumption.

What the commons makes possible is an environment in which individuals and groups can produce information and culture for their own sake. It allows for the development of a substantially more expansive role both for nonmarket production and for radically decentralized production. Already we are seeing nonprofit organizations using the World Wide Web to provide information or points of cultural exchange with much greater reach and efficacy than was ever before possible. No less importantly, the emergence of peer production of information and culture – phenomena epitomized by free software, but expanding to include news and commentary, as in slashdot, art, science, as well as directory and search facilities like the Open Directory Project[1]. Together these phenomena – the growth in the efficacy and reach of nonmarket actors and the emergence of radically decentralized information production – provide an enormously important counterpoint to the industrial information economy of the twentieth century.

But the democratic advantages, the individual freedom, and the growth through innovation that is made possible by the emergence of nonmarket and decentralized production will not emerge inexorably. The industrial giants that dominated information production and exchange in the twentieth century will not lightly relinquish their dominance. As we transition to a networked information economy, every point of control over the production and flow of information and culture becomes a point of conflict between the old, industrial model of production and the new distributed models. At the physical layer, ownership over wires and wireless licenses that are necessary to communicate provides a point of leverage for control. At the logical layer, necessary standards, protocols, and software – like operating systems – provide a point of control over the flow, and therefore the opportunities of production, of information and culture. At the content layer, intellectual property and business models that depend on tight control over existing information and culture – a central input into new creation – threaten to provide their owners with the ability to control who gets to say what to whom with the core cultural signifiers of out time.

5 A Core Common Infrastructure

In order to capture the benefits of freedom and innovation that the networked information economy makes possible, we must build a core common infrastructure alongside the proprietary infrastructure. Such a common infrastructure will stretch from the very physical layer of the information environment to its logical and content layers. It must be extended so that any person has some cluster of resources of first and last resort that will enable that person to make and communicate information, knowledge, and culture to anyone else. Not all communications and information production facilities need to be open. But there must be some portion of each layer that anyone can use without asking permission from anyone else. This is necessary so that there is always some avenue open for any person or group to articulate, encode, and transmit whatever he, she, or they want to communicate – no matter how fringe or unmarketable it may be.

The primary strategies for building the core common infrastructure are:

- An open physical layer should be built through the introduction of open wireless networks, or a spectrum commons.
- An open logical layer should be facilitated through a systematic policy preference for open over close protocols and standards, and support for free software platforms that no person or firm can unilaterally control. More important are the reversal or refusal to adopt coercive measures that prefer proprietary to open systems. These include patents on software platforms, and the emerging cluster of paracopyright mechanisms like the United States' Digital Millennium Copyright Act[2], intended to preserve the industrial business models of Hollywood and the recording industries by closing the logical layer of the Internet
- An open content layer. Not all content must be open, but intellectual property rights have gone wildly out of control in the past decade, expanding in scope and force like never before. There is a pressing need to roll back some of the rules that are intended to support the twentieth century business models. These laws were passed in response to heavy lobbying by incumbents, and ignored the enormous potential for nonmarket production and decentralized individual

1. <http://dmoz.org/>.

2. <http://www.loc.gov/copyright/legislation/dmca.pdf>.

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production to become central, rather than peripheral, components of our information environment

- Reforming organizational and institutional structures that resist widely distributed production systems.
  - The earliest large-scale successful model has been free software, with its informal social networks girded by the formal institutional framework of copyleft and open source licensing.
  - In science, we are seeing the early emergence of efforts by scientists to release science from the old industrial publication model. The Public Library of Science[3] and the Budapest Open Access Initiative[4] are the first primary efforts in this direction. They promise to provide a framework in which scientists – who already do the science, review the papers, and edit the journals more-or-less for free – can manage their own publication systems without relying on the large commercial publishers.
  - In publication more generally, the emergence of the Creative Commons is an enormously important facilitating institutional framework.
  - In informal personal communications, blogspace is emerging as an interesting social space for free, independent, and widely distributed information production.
  - In each case, the particular characteristics of the type of information, the institutional barriers of incumbency, and the social patterns of use are somewhat different. In each case, the solutions may be somewhat different. But in all cases we are seeing the emergence of social and institutional structures that allow individuals and groups to produce information free of the constraints imposed by the need to sell information as goods in a property-based market.

We stand at a moment of great opportunity and of a challenge to our capacity to make policy that puts human beings at the centre of the networked information society. Digital networks offer us the opportunity to enhance our productivity and growth while simultaneously improving our democracy and increasing individual freedom. These benefits come at the expense, however, of incumbents who have adapted well to the industrial model of information production, and are finding it difficult to adapt to the networked information economy that would replace it. These incumbents are pushing and pulling law, technology, and markets to shape the coming century in the image of the one that passed. It would be tragic if they were to succeed.

Building a core common infrastructure is a necessary precondition to allow us to transition away from a society of passive consumers buying what a small number of commercial producers are selling. It will allows us to develop into society in which all can speak to all, and in which anyone can become an active participant in political, social, and cultural discourse.

3. <http://www.publiclibraryofscience.org/>.
4. <http://www.soros.org/openaccess/>.

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Governing a Commons from a Citizen's Perspective

Elinor Ostrom[1]

HEINRICH BÖLL STIFTUNG NORTH AMERICA

For some analysts, citizens and local governments have no role in the governing of a commons. Since the publication of "The Tragedy of the Commons" by Garrett Hardin[2], users of common-pool resources such as fisheries, forests, or water aqueducts are perceived to be helpless perpetrators of resource destruction. Hardin presumed that individuals would always maximize their own immediate short-term, material benefits. This meant that they were helpless to do anything else but overharvest resource systems that were not privately owned or the property of a governmental unit. The prediction that individuals would destroy the very resources on which they depended was consistent with many economic models of one-shot or finitely repeated dilemma settings where everyone pursuing their own short-term benefits ended up achieving far less than was feasible if they had found a way of cooperating with one another.

Hardin's vivid portrayal of the helpless citizen opened up an important body of theoretical and empirical work that challenged the universality of his work. Many studies provided empirical data and theoretical arguments to challenge the presumption that individuals were forever trapped in a remorseless tragedy.[3] They document many local governance arrangements around the world where resource users have overcome the tragedy. Research illustrated the importance of common-property institutions in history and in the contemporary world. Instead of finding only private or government ownership arrangements that helped users to sustain a common-pool resource, scholars from multiple disciplines found a diversity of mechanisms to govern common-pool resources.

On the other hand, research has not found any "sure cures" for the complex problems related to the governance of a commons. Failure occurs in regard to private property, government property, and common property. Overharvesting of a valuable resource is, of course, assured when the resource is effectively an open-access resource with *no* established property rights. Hardin, and the myriad of scholars and policymakers from multiple disciplines who accepted his theory as a general theory, were thus correct in identifying a challenging problem especially under open-access conditions. Their analysis was incomplete, however, because they prescribed only two solutions. Both had to be imposed on resource users by external authorities.

Understanding How Citizens Overcome Collective Action Dilemmas

The extensive field research that challenged Hardin's theory was also inconsistent with an immense body of work based on game theory and microeconomic theory of individual decision making. In this article, I can only give a brief review of the developments that now place citizens as core actors in a complex, multi-actor approach to the polycentric governance of

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1 The author is Co-Director, Workshop in Political Theory and Policy Analysis, Indiana University and Founding Director of the Center for the Study of Institutional Diversity, Arizona State University.

2 HARDIN, Garrett: The Tragedy of the Commons. Science. 162. 1968. 1243–1248.

3 Cf: MC CAY, Bonnie J. & ACHESON, James M.: The Question of the Commons: The Culture and Ecology of Communal Resources. Tucson: University of Arizona Press. 1987. MERINO, Leticia & ROBSON, Jim: eds. Managing the Commons: Indigenous Rights, Economic Development and Identity. Mexico: CCMSS, The Christensen Fund, Ford Foundation, SEMARNAT, INE. 2005.

natural resources. I will briefly describe some of the experimental research that has shown that the model of the individual that is implicitly used by Hardin is too narrow. Then, I will turn to some of the key elements of institutional analysis that help to understand why citizens are able to craft institutions to cope successfully with a commons in some settings but not in others. Finally, I will address the recent efforts to over rely on decentralization to solve problems of common-pool resources. In this chapter, I focus primarily on natural resource commons given the research that has been completed in Latin America that addresses the important role of citizens in the governance of these resources.

Using Experimental Research to Analyze How Individuals Make Decisions

Findings from field studies of citizen-organized arrangements to govern common-pool resources successfully were a major puzzle to scholars as they were inconsistent with theoretical predictions drawing on a micro-economic model of the individual. How could individuals overcome the temptation to free-ride? Would they not be suckers who helped others do much better even when they did not get the full benefit of their own cooperation? These questions led several colleagues at Indiana University to design a common-pool resource experiment that has been repeatedly tested in experimental laboratories and replicated in other labs and in field experiments in Latin America.[4]

The prediction that users will over-harvest a common-pool resource is supported in experiments where participants do not know the other individuals who are involved, and when they cannot communicate with each other. Providing repeated opportunities for face-to-face communication is not predicted to change the outcome, however, it does change behavior and outcomes. Groups that can repeatedly communicate in a lab are able to achieve close-to-optimal outcomes instead of grossly overharvesting. Communication enables particpants to discuss how they understand the structure of the setting and how they can jointly improve their outcomes.

Juan Camilo Cárdenas has undertaken a wide variety of common-pool resource experiments in field settings across Colombia.[5] Participants tend to make different decisions based on their individual identity (including their wealth, preferences for others' well being, gender and age) as well as our experimental design. To explain these differences in the level of cooperation achieved, we have developed an initial framework shown in Figure 1. We posit three "layers" that affect the decisions of an individual to cooperate in a common-pool situation: their own identity, the group context in which decisions are being made, and whether the situation is repeated and it is possible to use reciprocity and gain a reputation for trustworthiness. These turn out to be among the important micro-level variables that explain the diversity of decisions to overcome the strong temptations of common-pool resource dilemas. Individual values are not sufficient, however, to solve all common-pool resource problems. Without institutions that facilitate the building of reciprocity, trust, and trustworthiness, citizens face a real challenge.

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4 OSTROM, Elinor & GARDNER, Roy & WALKER, James: Rules, Games, and Common-Pool Resources. Ann Arbor: University of Michigan Press. 1994.
CASARI, Marco & PLOTT, Charles R.: Decentralized Management of Common Property Resources: Experiments with a Centuries-Old Institution. Journal of Economic Behavior and Organization 51. 2003. 217–47.

5 CÁRDENAS, Juan Camilo: How Do Groups Solve Local Commons Dilemmas? Lessons from Experimental Economics in the Field. Environment, Development and Sustainability 2(3–4). 2001: 305–322.

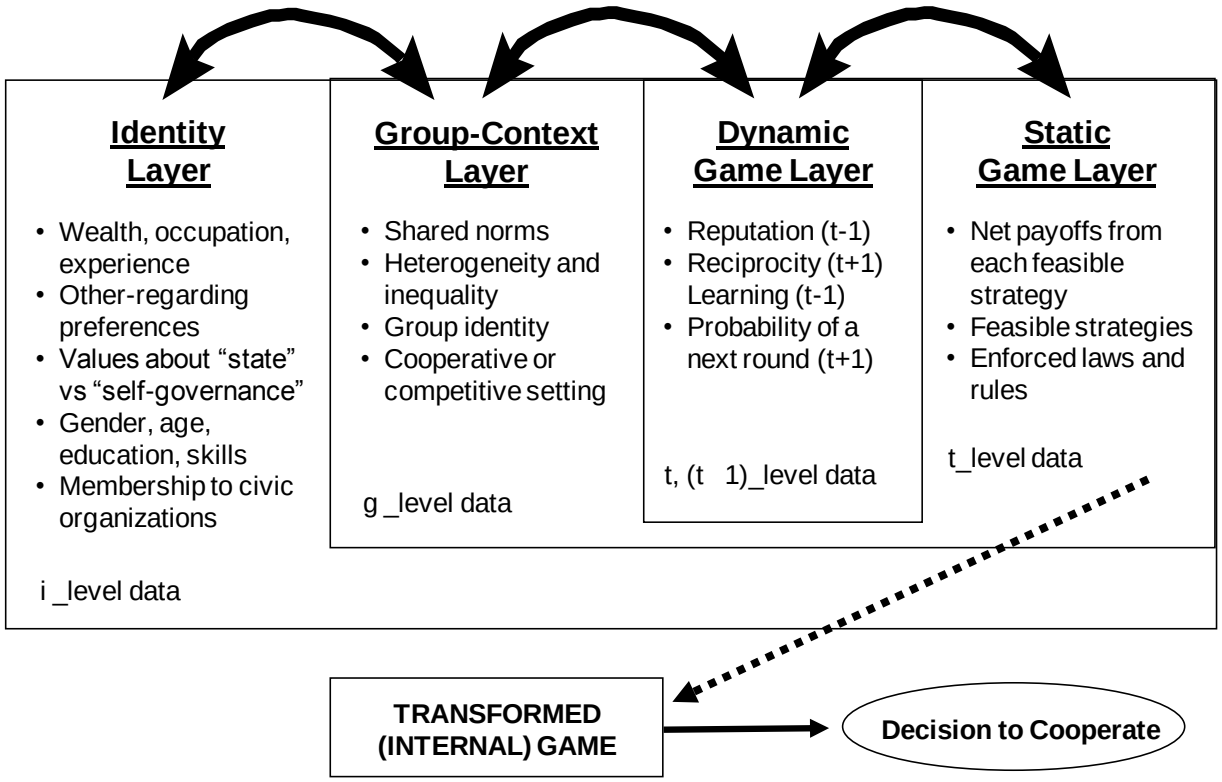

Figure 1. A framework of the multiple layers of information players use in the game

Source: Adapted from Cárdenas and Ostrom (2006).

CÁRDENAS, Juan Camilo & OSTROM, Elinor: How Norms Help Reduce the Tragedy of the Commons: A Multi-Layer Framework for Analyzing Field Experiments. In *Norms and the Law,* ed. John N. Drobak, 105–36. New York: Cambridge University Press. 2006.

The Importance of Institutions

The complexity of many natural resources requires sophisticated multitier or polycentric governance systems rather than a reliance on a single type or level of governance.[6] Actors who try to govern a complex resource face a variety of incentives that often complicate collective efforts and subsequent outcomes. The more complex a resource is, in terms of the types of goods and services that it provides, the more challenging it is to craft a well-tailored set of institutional arrangements that offset the incentives to overharvest. Some actors may be tempted to shirk from their contributions to the governance arrangements by not attending meetings or not paying the membership fees. Others may actively try to weaken the rules so that they can use the resource with fewer constraints. A robust governance system recognizes

[6] McGINNIS, Michael D.: Polycentric Governance and Development: Readings from the Workshop in Political Theory and Policy Analysis. Ann Arbor: University of Michigan Press. 1999.
OSTROM, Elinor: Understanding Institutional Diversity. Princeton, NJ: Princeton University Press. 2005.

the multi-scale aspects of natural resource governance as well as the presence of individual incentives, and seeks to correct them.[7]

When citizens and their officials establish organizations with the authority to decide how to manage a resource, what time and monetary contributions are required, as well as the authority to sanction those who do not contribute resources, they organize *provision or collective consumption units.* Many, but not all, provision units have the formal status of a government established at a local, regional, or national scale. Governmental units may be general-purpose or organized as a special district or regime for the purpose of providing one or a limited range of collective goods. Private associations that plan the use of a resource and can also sanction, or even expel, those who do not contribute their share of resources to provide for a collective good, may also serve as collective consumption units. Sports leagues and housing condominiums are two types of private associations that provide collective goods for their members.

Other forms of collective consumption units include farmers who organize themselves to manage an irrigation system or a common pasture; a national agency that monitors the investment or production processes of private firms to protect consumers against fraud or ecological damage; a local, national, or international government that provides services of diverse types; or even an illegal cartel of private corporations that decide on the amount of output they will jointly produce. Thus, provision units exist at all scales and in both public and private spheres. Participants can, and do, craft a diversity of rules that help them overcome the free-rider problem by deciding who is included and must contribute resources and who is excluded and how to exclude them. Further, if the provision system continues to develop, participants (or their representatives) are likely to devise rules that specify allowable forms of access and use, methods for monitoring behavior and sanctioning violators of rules, and ways of resolving conflict.

These systems often do not resemble the textbook versions of either a government or a strictly private-for-profit firm, especially when participants have constituted their own self-governing units. Especially when participants have constituted their own self-governing units. Thus, scholars drawing on traditional conceptions of 'the market' and 'the state' have not recognized them as potentially viable forms of provision organization and have either called for their consolidation into a centralized government (as metropolitan reformers continue to do) or ignored their existence (as many resource economists have done). It is a bit ironic that many vibrant self-governed institutions have been misclassified or ignored in an era of ever greater democratization. Recent efforts to "decentralize" governmental arrangements also do not recognize the importance of complex, polycentric arrangements and think instead of a single government at some level taking charge of a policy arena.

Commonly Understood and Enforced Rules

A key finding of empirical field research is the multiplicity of specific rules-in-use found in operational settings related to the provision and production of collective goods. One of the most important types of rules is *boundary* rules. They determine who and what is in and out of a provision organization. Provision units face considerable biophysical constraints when the good

[7] FUTEMMA, Celia & De CASTRO, Fabio & SILVA-FORSBERG, Maria Clara & OSTROM, Elinor: The Emergence and Outcomes of Collective Action: An Institutional and Ecosystem Approach. Society and Natural Resources 15(6) (July) 2002. 503–522.

is a natural common-pool resource such as a groundwater basin, a river, or an air shed. Such resources have their own geographic boundary. Matching the boundary of those who benefit and those who contribute with the care of a resource, is a major challenge. It may be impossible in a highly centralized regime. Further, common-pool resources may themselves be nested in an ever larger sequence of resource units such as a micro watershed, which is nested in a system of ever larger watersheds that eventuates into a major river system such as the Rhine or the Mekong River.[8]

Once basic boundary rules define who is a legitimate beneficiary and who must contribute to the provision of a collective good, provision units frequently create rules related to the information that must be made public or kept secret, to the actions that must or may be taken or are forbidden, and the outcomes (and resulting benefits and costs) to be achieved and distributed. An essential attribute of effective rules is that rules must be generally known and understood, considered legitimate, be generally followed, and enforced.[9] Written legislation or contract provisions that are not common knowledge do not affect the structure of a particular action situation unless someone involved in the situation invokes the rule and finds someone to enforce it. Thus, one of the problems in doing empirical research on the effect of diverse institutional arrangements is trying to sort out the rules that exist only on paper and are *not* used by participants as contrasted to rules that are common knowledge of the participants and enforced locally but not part of the formal legal structure.

Attributes of a Community

Many attributes of a community are also likely to affect provision activities, including the size of the group affected, the homogeneity or heterogeneity of interests, the patterns of migration into or out of a community, and the time horizon (length of time into the future taken into account) used by individuals in ongoing situations. For an institutional analyst, the important set of questions that needs to be addressed includes:

- Is there general agreement on the rules related to who is included as a member with both benefits and responsibilities?
- Do the members have a shared understanding of what their mutual responsibilities are as well as the formulae used for distribution of benefits?
- Are these rules considered legitimate and fair?
- How are the rules transmitted from one generation to the next or to those who migrate into the group?

A diversity of community attributes affects the answers to these questions. For an institutional analyst to understand the structure of the action situations facing that community, and thus examine the incentives facing the participants and their likely behavior and outcomes, the analyst must assume that a community is actually using a set of rules, and will continue to do so for at least the near future.

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8 Cf: MYINT, Tun: Democracy in Global Environmental Governance: Issues, Interests, and Actors in the Mekong and the Rhine. Indiana Journal of Global Legal Studies 10(1) 2003. 287–314.

9 Cf.: OSTROM: ibid. and OSTROM, Elinor & NAGENDRA, Harini: Insights on Linking Forests, Trees, and People from the Air, on the Ground, and in the Laboratory. Proceedings of the National Academy of Sciences 103(51) 2006: 19224–19231.

Multiple Interacting Factors Affect Outcome

Leticia Merino, co-author of this volume, has written an important book on the factors that work together to improve the likelihood that local communities—who have already been assigned considerable autonomy to create their own governance structures—will actually design effective institutions for managing forest resources. She studied forestry resources in six communities located in three states in Mexico: Michoacan, Oaxaca and Quintana Roo. Merino demonstrates that the population density of the users of a forest is not a key determinate affecting resource degradation. She digs into a wide diversity offactors that could potentially explain the different rates of deforestation observed among the six communities. And, she investigates the relationship among local, regional and national factors. Instead of finding a single element as the primary cause of a community's successful or unsuccessful effort to manage forest resources, she finds a complex set of factors that together affect the incentives and behavior of citizen-users so as to lead to a better quality forest.

The communities in her study design well-working local institutions to manage local forests when effective social capital has been built over time within a community and when the interests of the more powerful members of the community are aligned with the effective management of forest resources. Local governance is, however, always embedded in and affected by regional and national policies. Merino finds, however, that the regional and national regulatory systems have not encouraged community forestry in Mexico.

Effective rules and incentives passed at regional and national levels are more the exception than the rule in Mexico. If anything, government policies have generated more incentives that work against the effective management of forests, than incentives encouraging sustainable development. When not an active negative factor adversely affecting responsible local management, state and national laws have simply overlooked the capacities of local users to develop effective rules, monitor them, and impose graduated sanctions that let users know that infractions are observed without engendering a overreaction to their imposition.

Decentralization as a Recently Recommended All-Purpose "Remedy"

Given the difficulties in achieving effective engagement of citizens in the governing of local commons, decentralization has become a frequently recommended policy.[10] Andersson, Gordillo, and Van Laerhoven have published an excellent study of decentralization and rural development with a focus on Latin America.[11] In particular, they examine on Bolivia, Guatemala, and Peru drawing on extensive field studies largely undertaken in 2002. These three countries are relevant cases for a comparative study. All three share many essential biophysical, socioeconomic, historical and cultural characteristics, but they differ in regard to their decentralization policies. Bolivia, Guatemala, and Peru are relatively poor with large rural and indigenous populations, significant natural resources, high proportion of forest cover, and frequent land use-related disputes. But all three countries differ a great deal when it comes to

[10] OECD: Final Report of the DAC Ad Hoc Working Group on Participatory Development and Good Governance. Paris: OECD. 1997.

[11] ANDERSSON, Krister & GORDILLO DE ANDA, Gustavo & VAN LAERHOVEN, Frank: Decentralization and Rural Development: Local Governance Lessons from Latin America. Tucson: University of Arizona Press. 2008.

the degree of decentralized governance structure in each country's natural resource sectors even though all have locally elected mayors. Guatemala would have the greatest amount of regulatory power that a national government assigns to its local governments. Bolivia would have assigned a moderate level of regulatory powers to local government, while Peru has virtually no local decision-making power in the natural resource sectors.

Bolivia and Guatemala passed reformed forestry laws in 1996. These were the first efforts to decentralize several tasks and responsibilities in the forestry sector from central to municipal governments. Even with this reform, however, Bolivian municipalities are not authorized to collect any taxes on forestry activities, to charge user fees for services produced, or to impose fines on individuals who are caught disobeying the government laws and regulations.[12] In contrast, Guatemalan municipalities may own, manage and even rent out their forests. Within municipal and communal forests, Guatemalan municipalities are authorized to regulate and tax forest use, as long as the local rules do not contradict the national forestry law. In Peru, governance responsibilities were not decentralized at all. The central and regional governments retained complete formal control over the natural resource sectors' decision-making process.

To obtain sufficient data about local government institutions and actions, Andersson, Gordillo, and Van Laerhoven conducted field surveys in a random sample of 100 municipal governments in Bolivia, Guatemala, and Peru. The research staff interviewed the elected mayor to gather information regarding the mayor's policy priorities, staffing arrangements, relationships with central and nongovernmental agencies, and relationships with natural resource users and citizens at large. In addition, the research teams collected structural and socioeconomic information for each municipality, originating mostly from sub-national census data and national forestry sector databases.

Andersson and Ostrom draw on the data in this study to analyze the influence of seven independent variables on local commitment to invest in natural resource governance.[13] We first include the percentage of the municipal government personnel that works with issues related to natural resource management. A second complementary dependent variable records the view of the mayor related to the political priority of natural resource governance for his administration.

In a polycentric approach to the study of decentralized natural resource governance[14], we posit that multilevel processes have largely been overlooked in the conventional empirical literature on decentralization. So we examine the interactions between actors at three different levels of governance. We have a look at the financial transfers from the central government to the municipal government in the area of natural resource governance, and we examine how this interacts with political pressure from local community-based organizations and nongovernmental organizations working on local resource management. These variables capture important incentive structures related to political accountability and affect the local mayor's political commitment to natural resource governance.

Institutional incentives originating from interactions between actors *across* governance levels,

[12] PACHECO, Diego: An Institutional Analysis of Decentralization and Indigenous Timber Management in Common-Property Forests of Bolivia's Lowlands. Ph.D. dissertation, Indiana University. 2007.

[13] ANDERSSON, Krister & OSTROM, Elinor: An Analytical Agenda for the Study of Decentralized Resource Regimes. Policy Sciences. 2008.

[14] ANDERSSON, Krister & GIBSON, Clark: Decentralized Governance and Environmental Change: Local Institutional Moderation of Deforestation in Bolivia. Journal of Policy Analysis and Management 26(1). 2007. 99–123.

i.e. between actors with different positions of authority, are important determinants of local government investment in natural resource governance. For example, when interactions with local organizations are at the minimum level the probability of observing high priority given to natural resources in a municipality is around one-third. In contrast, when these multilevel interactions are most frequent, the same probability more than doubles.[15] Mayors are also strongly influenced by clear institutional incentives to focus on local natural resources, regardless of the extent of decentralization.

As a result of additional tests, we found no support for any systematic influence of decentralization on the two outcome measures: (1) the financial transfer from the central government to the municipal level and (2) the types of local political pressures related to environmental policies. Formal decentralization reform does not provide a good explanation of inter-country or intra-country variation in local commitments to natural resource governance. The results also suggest that the characteristics of local institutional arrangements, which govern the interactions between municipal authorities on the one hand and local groups and central government actors on the other, provide powerful explanations to the variability in local commitments to natural resource governance -- regardless of the formal structures of governance at the national level.[16]

As the physical scale of a resource changes, so do the types of collective goods that a resource offers to users (ranging from private goods of fuel-wood and local mushrooms at the micro-scale to global public goods of maintenance of a stable forest gene pool or storing carbon in trees to stabilize the climate). Users tend to be most interested in goods and services generated at a local level and take less notice of those generated by larger scales. The threat of major climate changes is the result of that lack of attention that citizens around the world have paid to the effect of their actions on the global atmosphere. Because of the strong actions of many environmental groups, more citizens are now paying attention to the global scale. Citizen awareness and action, however, are not sufficient to solve the problem of global climate change but are important in influencing national governments to change policies toward use of carbon generating processes.

To govern a process that can provide incentives to users to safeguard the long-term delivery of such a variety of goods requires more than financial resources and accountability mechanisms at a single level of governance. Most scholars agree that large variations in policy outcomes exist within countries that have decentralized their governance of public goods and services. Little or no consensus exists, however, about which factors explain this variation. Many extant empirical studies do not go beyond the boundaries of local governments to examine why some local units perform better than others. Nevertheless, the processes enhancing effectiveness of a governance system are usually larger or smaller than the internal dynamic of any particular governmental administration. A key to effective governance arrangements lies in the relationships among actors who have a stake in the governance of a resource and not just one level of government. The social capital that citizens can create by linking with each other, with non-governmental organizations, and with governmental actors at diverse levels is essential for effective feedback, learning, and crafting of new and better solutions.

By considering the interaction between actors at different levels of governance, it is possible to

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15 ANDERSON & OSTROM: ibid.

16 ANDERSSON, Krister: ¿Cómo Hacer Funcionar la Gestión Forestal Municipal? Lecciones de Bolivia. La Paz, Bolivia: Plural Editores. 2005.

contribute to a more nuanced understanding of the variation in diverse governance outcomes in the management of common-pool resources based on the needs and interests of citizens. We have learned that citizens do play an essential role in the governance of common-pool resources and that efforts to turn over all of the responsibility for governing these resources to external experts are not likely to protect them in the long-run. The complexity of the resources at local, regional, national, and global levels do require complex governance systems involving citizen input in diverse fashions.

The Tragedy of the "Tragedy of the Commons"

Achim Lerch[1]

HEINRICH BÖLL STIFTUNG NORTH AMERICA

> *"Le premier qui ayant enclos un terrain, s´avisa de dire,* ceci est à moi, *et trouva des gens assez simples pour le croire, fut le vrai fondateur de la société civile."*[2]
>
> *"Give a man the secure possession of bleak rock, and he will turn it into a garden; give him nine years lease of a garden, and he will convert it to a desert....The magic of property turns sand into gold."*[3]

Private Property and Common Property

The prevailing liberal theory of property today – at least in the "western world "– essentially traces back to John Locke, in particular, to the chapter "Of Property" in the second of his *Two Treatises of Government* appearing in 1689.[4] The Lockean argumentation provides a justification for *private* property rights, which exist as natural rights, also independent of the consent of society. In contrast, for example, to a utilitarian view, where property rights are seen only as a means to an end (the end generally being utility maximization), property rights take on genuine importance in liberal social theory – among things, also as individual rights to defend against a superior (state) collective. This is based on the central notion that each individual has a property in his own person, that is, an unlimited right of disposition over himself, his own body, his own faculties, and his own labor. Gerald A. Cohen, Professor of Political Philosophy at Oxford, coined the phrase *self-ownership* to describe this concept.[5]

For Locke, the justification for private property rights directly follows from this premise of *self-ownership*, in connection with the need to use natural resources for survival. Everyone has a right to the fruits of his labor, to everything that he takes from nature and thus makes useable without requiring "any express compact of all the commoners." (Locke 1986: 115[25]).

Precisely on this point, Locke's position is diametrically opposed to Immanuel Kant's view. Kant said, Locke's justification for property in fact was not a real *justification* for property but merely a description of "what is universally valid and absolutely necessary."[6] Locke mainly

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[1] The author is an economist currently writing his postdoctorate work on environmental economics. He lectures at the universities of Kassel and Rostock, Germany.

[2] "The first man, who, after enclosing a piece of ground, took it into his head to say, 'This is mine,' and found people simple enough to believe him was the true founder of civil society." ROUSSEAU, J.J.: *A Discourse upon the Origin and the Foundation of the Inequality Among Mankind*. First publication 1755.

[3] YOUNG, Arthur: *Travels*, vol. 1, 1787; quoted here according to BRUBAKER, E.: *Property Rights in the Defence of Nature*. London Toronto (Earthscan). 1998. p. 214.

[4] The following quotes refer to the page numbering in the German translation LOCKE, John: *Bürgerliche Gesellschaft und Staatsgewalt*. *Sozialphilosophische Schriften*. Berlin. (das europäische Buch publishers). 1986. The paragraph numbers are additionally cited.

[5] COHEN, G.A.: *Self-Ownership, World-Ownership and Equality*. In: LACASH, F. (Ed.): *Justice and Equality Here and Now*. Ithaca (Cornell University Press). 1986. pp. 108-135.

[6] C.f. BROMLEY, D.W.: *Environment and Economy: Property Rights and Public Policy*. Oxford (Basil Blackwell). 1991 and WILLIAMS, H.: Kant's Concept of Property. Philosophical Quarterly *27.*

confused e*mpirical possession* with *de jure* or *socially recognized property*. According to Kant, physical appropriation was *necessary* but not *sufficient* to justify property. Empirical possession alone could not justify a property right. Rather, the nature of property was defined precisely by the fact that it continues to exist even if there is no physical possession. Locke thus overlooked that a social contract must logically precede property.[7]

Kant further argued that Locke's *self-ownership theory* was insufficient to legitimize private property rights to resources to the extent that appropriation is always linked to the use of *external resources*. It is not one's own labor alone but its mixing with resources that do not belong to the individual (e.g. land) that justifies private property. This too was one of Kant's objections to Locke: Kant also did assume that the individual had "undisputable property" of his own creations, but the individual was, at best, productive in his dreams. "The external objects of general will," on the other hand, did not originate from labor or the will of the producer but belonged to all in common and could merely be modified through labor. But if resources are, from the start, the common property of all people, the *self-ownership theory* cannot alone justify any private ownership of resources. In principle, Locke sees it the same way. He assumes – just as Kant does – that the earth and its resources originally belong to *all people in common*.[8] To this extent, individual appropriation is, in principle, contingent on the consent of the co-owners. But he develops a cost argument because – as economic theorists would say today – the *transaction costs* involved in obtaining this consent seem too high to him. There was thus a risk, in Locke's view, that people would starve despite the abundance of natural resources available to them. (Locke 1986: 117[28]).

To resolve this dilemma, Locke not only posits the natural right to appropriate resources but also emphasizes a *natural limitation on* property. First, in each case of appropriation, enough must remain for others and second, each individual may appropriate only as much as he himself consumes. According to Locke, no one could deprive others of something by appropriating too much. These conditions are referred to in the literature as "Lockean condition(s)." According to Locke, compliance with these conditions in their natural state was ensured in that the mass of property was determined by nature. No one could either subdue or appropriate all for himself. No one could consume more of the natural resources than a small portion, and thus no property could be acquired at the expense of another.

1977. *p.* 32-40.

[7] Kant's view of property as outlined here relates to his thoughts in the *Metaphysischen Anfangsgründen der Rechtslehre* (*Groundwork of the Metaphysics of Morals)* of 1797. In the 1760s, Kant still held a view that had much more in common with Locke's position. In the *Beobachtungen über das Gefühl des Schönen und Erhabenen* (*Observations on the Feeling of the Beautiful and Sublime*) of 1764, he developed a theory according to which the conscious will of man justified private property in connection with labor, virtually an amended version of Lockean thought. Kant himself had never published these early thoughts on property law and later distanced himself from them. (cf. BRANDT, R.: *Eigentumstheorien von Grotius bis Kant*. Stuttgart Bad Cannstatt (Frommann-Holzboog). 1974. p. 167 et seqq.)

[8] "It is very clear, that God, as King David says (. . .) 'has given the earth to the children of men,' given it to mankind in common." Locke 1986: 115[25]. Kant, for example, speaks of an "innate right of common possession of the surface of the earth" and of the "original community of the soil and of the things upon it" as "objective reality."(1986: 359).

These natural limits were, in Locke's view, definitively overtaken by the invention of currency and the tacit human agreement to assign such a large value to it.[9] Thus, he himself, in principle, suggested that his justification for the natural property right was only to a limited degree applicable to most distribution issues in a monetized economy where capital is accumulated in proportion to labor. Locke views the uneven distribution of property in such a society as the result of a "tacit and voluntary consent" of men.[10] Thus, both Kant and Locke, in principle, assume that property rights always represent a social construct and that private property rights generally require the consent of the other members of society.

Consequently, private property rights, in principle, represent a special form of common property. Until today, there seems to be certainty about what constitutes "private property," but enormous confusion continues to prevail with respect to the term "common property" and is encouraged by the frequently imprecise use of the term. Not least, the famous metaphor of the "tragedy of the commons" contributes to this confusion over the term. It therefore seems necessary to thoroughly analyze this "tragedy."

"The Tragedy of the Commons"

When we deal with the question of the common use of resources, *The Tragedy of the Commons* almost automatically comes up. The metaphor was coined by the American biologist Garrett Hardin in one of the most influential articles in the social sciences. The tragedy of the commons lies in the expectation that a resource will be overused when it is part of a "commons."[11] Hardin uses the example of a jointly used pasture which is overgrazed by rational herdsmen because they are able to completely privatize the benefit of a larger herd while passing on the costs of overgrazing to all the herdsmen. Hardin was by no means the first to formulate such a theory. Aristotle already noted in his *Politics* that the least amount of care is given to that which jointly belongs to the greatest number of individuals. Thomas Aquinas also pointed out this problem. In 1833, William Forster Lloyd outlined a theory on the careless use of common property, which Hardin cites. In 1954, a similar problem was described by H. Scott Gordon in connection with the fishing industry. In his essay *The Economic Theory of a Common-Property Resource: The Fishery*, Gordon arrives at the now famous conclusion: "everybody's property is nobody's property."[12] Still, Hardin's article is viewed as *the* reference when it comes to questions of common ownership of natural resources.

Hardin applies his metaphor primarily to point out problems of overpopulation and the increasing pressure that it places on resources as well as the problem of environmental pollution. Yet he himself, by the way, doubts the possibilities of countering the tragedy of "the commons as a cesspool" through private property rights.[13]

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[9] LOCKE: Ibid., p. 121, et seqq. [36-51].

[10] LOCKE Ibid., p. 130 [50].

[11] HARDIN, Garrett: *The Tragedy of the Commons*. Science 162. p. 1243 – 1248.

[12] Hardin himself insists on the originality of his theories as opposed to Aristotle's: "I was soon informed that there were a considerable literature on 'common pool resources' in economics and that Aristotle long ago had said, 'What is common to the greatest number gets the least amount of care'. So what is new in my essay? Just this, I think: the *emphasis* on the tragedy of the situation. Aristotle's statement is as bland as a bureaucrat's: It hardly impels one to take action." (Hardin 1980:115).

[13] "The tragedy of the commons as a food basket is averted by private property, or something formally like it. But the air and waters surrounding us cannot readily be fenced, and so the tragedy of the commons as a cesspool must be prevented by different means, by coercive laws or taxing devices that

Not least, Hardin's image of the overgrazed pasture resulted in a widely uncritical reception and transfer of the tragedy of the commons to numerous situations of collective resource management. From a historical view, however, the metaphor needs to be seen in relative terms:

For example, the British historian Dahlman disputes that the cited tragedy actually occurred in the medieval open field system in England. The same can presumably be said for other countries. Various forms of commons management existed over centuries in northern Europe.[14] According to the central theory of Hardin's critics, overuse was generally prevented within these systems through a sophisticated structure of norms practiced by the respective communities. "The existence of common property was (. . .) historically always linked to certain rules set by the community which prevented misuse of common resources."[15] This restriction also pertains to current examples of common use of resources, as Elinor Ostrom in particular shows.[16] The tragedy of the commons has turned into a kind "ineradicable myth," as even sharper critics have described it. Referring to Hardin's analytically flawed description and quoting the crucial passage on page 1244,[17] Partha Dasgupta, an economist at Cambridge, for example, comments that it is difficult to find a passage of comparable length and fame that contains so many errors as the one quoted.18 Aguilera-Klink even talks about conceptual errors in Hardin's article that are consistently repeated by economists. She laments that possibly only a few have read much more than the title of the essay.[19]

Precisely because Hardin ignores the rules and norms that could possibly prevent overuse of common property resources, what he describes is in fact not a tragedy of common property structures but rather a tragedy of *open access* regimes.[20] One must also see Bromley's comment in this context, when he says it would be difficult to find an idea (a concept) that has been as misunderstood as that of the commons and common property.

> There is no such thing as a common property *resource* – there are only natural resources controlled and managed as common property, or as state property, or as private property. Or, and this is where confusion persists in the literature, there are resources over which *no property rights* have been recognized. The latter situation is one of *open access* (*res nullius*).[21]

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make it cheaper for the polluter to treat his pollutants than to discharge them untreated." (HARDIN: ibid., p. 1245).

14 Cf., et.al. BACKHAUS, J.: *Gemeineigentum: Eine Anmerkung*. In: BACKHAUS & NUTZINGER (Hrsg.): *Eigentumsrechte und Partizipation*. Frankfurt a.M. (Haag u. Herchen). 1992. pp. 103-124. Also: STEVENSON, G.G.: *Common Property Economics. A General Theory and Land Use Applications*. Cambridge, Cambridge University Press. 1991. Stevenson compares the Swiss commons system of Alps management with the English open field system.

15 GEY, P.: *Zum Verhältnis von Theorie und Geschichte in der Property-Rights-Ökonomie (On the Relationship between Theory and History in a Property Rights Economy)*. In: BACKHAUS & NUTZINGER (Hrsg.): *Eigentumsrechte und Partizipation (Property Rights and Participation)*. Frankfurt a.M. (Haag u. Herchen). 1982. pp. 73-102.

16 OSTROM, E.: *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge, Cambridge University Press. 1990. See also Elinor Ostrom's contribution in this book.

17 HARDIN, G.: *The Tragedy of the Commons*. Science 162. 1968. p.1244

18 DASGUPTA, P.: *The Control of Resources*. Oxford. Basil Blackwell. 1982.

19 AGUILERA-KLINK, F.: *Some notes on the misuse of classic writings in economics on the subject of common property*. Ecological Economics 9: 1994. pp. 221-228

20 Hardin in fact writes: "Picture a pasture *open to all*." (Hardin ibid. p.1244, emphasis added).

21 BROMLEY: Ibid. Emphasis in the original.

Stevenson, who dedicates an entire book to common property economics, likewise points out a confusion of definition and then proceeds to clearly distinguish *open access* from *common property* in theoretical and conceptual terms.

Even though one should think that the main difference between common property and open access is now sufficiently known, the confusion persists. Just to name one of many examples, a reputable and otherwise outstanding and widely read textbook on microeconomics incorrectly defines **"common property resources"** as **"resources to which everyone has open access."**[22]

If common property, in contrast to open access, is perceived for what it is – a form of common property for which clear institutional rules of use and restrictions on access exist – then it becomes evident that the problem of overuse, or the incentive to overuse, must be viewed in a more nuanced manner. Here, one must differentiate among various cases: \

First, it is possible for rules of access and use to be *insufficiently defined*, in other words, the proverbial "backdoor" is left open, thereby creating incentives for overuse. This case is clearly different from situations where overuse of the resource is based on the *violation* or *breach* of existing rules. It would be hyperbole to call this the "tragedy of the commons" (and thereby imply a structural flaw in the property rights structure), just as it would be hyperbole to interpret theft of private property as the "tragedy of private property."[23] Rather, it is a problem of *control* and *enforcement* of existing property rules.

From the simplistic structure of this erroneously understood "tragedy of the commons" follow similarly simplistic recommendations for action. According to Ostrom, they essentially assert that problems of common resources can be resolved only either through a "Leviathan" system (in the sense of a strong government; sometimes, even an "eco-dictatorship" is suggested) or through total privatization. The work of R. J. Smith, senior fellow at the National Center for Public Policy Research, a conservative American think tank, is typical of this approach. For Smith, the problem of how to manage biological resources can be solved by answering obvious questions such as, Why was the American buffalo nearly exterminated but not the Angus or the Jersey cow? Why are salmon and trout overfished in the nation's lakes and rivers and streams, while they thrive in private fish farms and private lakes? He promptly offers up the answer:

> In all these cases, it is clear that the problem of overexploitation or overharvesting is a result of the resource's being under public rather than private ownership. The difference in their management is a direct result of two totally different forms of property rights and ownership: public, communal, or common property vs. private property.

So, according to Smith, the American salmon are disappearing from most rivers or are being heavily depleted because they are being treated as part of the "common heritage of mankind" and, as a "common property resource," they belong to everyone, can be caught by everyone, and essentially belong to no one. The (northern) European salmon, by contrast, are in much better shape, he asserts, because "some of the finest stretches of rivers are owned or leased by individuals, *groups of fishermen*, or fishing lodges, and the salmon are not overfished."[24]

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[22] PINDYCK, R.S. & RUBINFELD, D.L.: *Microeconomics*. Munich et.al. (Pearson Studium). 2005.

[23] This is based on the inconsistent assumption that economic subjects always respect private property, but disrespect existing rules on the use of common property at every opportunity.

[24] SMITH, R.J.: *Resolving the Tragedy of the Commons by Creating Private Property Rights in Wildlife*. CATO Journal 1: 1981. 439-468. Quoted passages, pp. 444-448. Author's emphasis.

This view of common property clearly describes more an open access condition along the lines of the above distinction in terms, while common property for clearly delineated communities (i.e. a *group* of fishermen!) is deemed private – instead of – collective property. One of the pioneers of environmental economics, K. William Kapp, expressed the concept much more clearly, long before Hardin:

Wild und Fisch gelten nach amerikanischem Gesetz als freie Güter, bis sie gefangen bzw. Erlegt sind. Die Tatsache, dass Eigentumsrechte nur auf erlegte und gefangene Tiere geltend gemacht werden können, macht diese 'flüchtigen' Ressourcen besonders anfällig für die Ausbeutung durch private Jäger und die kommerzielle Fischerei. Die Tatsache, dass Ressourcen frei und weder Gemein- noch Privateigentum sind, verleitet den einzelnen Jäger oder Fischer dazu, seinen Fang zu maximieren, weil ihm sonst sein Konkurrent zuvorkommt.[25]

Another approach would be to question the assumptions about behavior put forth in the parable of the "tragedy." That, in certain situations, there are incentives to maximize one's own benefit even at the expense of others (co-owners) does not necessarily mean that these incentives *always* determine actual behavior. Rather, the results of experimental economics of the past years indicate that individuals can indeed be assumed to show a general willingness to behave cooperatively. This willingness does, however, threaten to fade whenever cooperative behavior is repeatedly "punished" by the uncooperative behavior of others (also individuals). It is therefore especially important which specific (sanctions) rules are tied to various forms of (common) property.

In the case of open access, a distinction is to be drawn between the case of complete open access and situations where the number of resource users is limited but individual use of the resources is not. According to Stevenson, this case of "limited user open access," like "complete open access," also ultimately leads to overuse.[26] A pure access limitation, that is, a limitation on the number of users, therefore would not be sufficient. Additional rules are thus needed in order to sustainably manage a common property resource in an open access situation.

For Stevenson, a "private property, common property, open access trichotomy" ultimately exists. He compares these three forms in terms of group limitation and extraction limitation. Characteristic of the common property form is that both the group and the extent of resource use are limited by the individual members:

[25] KAPP, K. William: *Social Costs of Private Enterprise*. Frankfurt a.M. 1988. p. 81. Emphasis added.

[26] STEVENSON, G.G: *Common Property Economics. A General Theory and Land Use Applications*. Cambridge. Cambridge University Press.1991.p.58.

	Property Institution			
	1	2	3	
			Open Access	
	Private Property	Common Property	Limited User	Unlimited User
Group Limitation	one person	members only	members only	open anyone
Extraction Limitation	extraction limited by individual decision	extraction limited by rules	extraction unlimited	extraction unlimited

Source: Stevenson 1991:58

Thus, two essential findings of this analysis are important to the discussion on the commons: First, a clear distinction is to be made between resources owned in common (*common property*) and resources for which no property rights have been defined (*open access*). Second, the much quoted phrase "tragedy of the commons" is, at best, unclear because it frequently describes not a tragedy of the commons but a tragedy of open access.

With a view to the destruction of tropical rain forests, Bromley accordingly states that the real tragedy of the commons is the process whereby the property rights structures of indigenous peoples is undermined and delegitimized.[27] This assessment is also shared by the U.S. National Research Council: "This is the real tragedy of the commons: traditional management systems that were effective for thousands of years became obsolete in a few decades, replaced by systems relentless exploitation of rural people and rural countries."[28] **". . .the collapse of traditional common property regimes and open access to resource exploitation leaves rural communities hardly any means to maintain sustainable resource management."**[29]

Thus, the question concerning the efficiency of common ownership of resources, which is often hastily answered with the argument of the "tragedy," remains, in principle, open. Every allocation of property rights, whether private or common, is associated with costs from an economic perspective. Which property rights option will ensure efficient resource use will depend in each individual case on these transaction costs.[30] "Not only is common property

[27] BROMLEY: Ibid., p.104.

[28] U.S. National Research Council, Board on Science and Technology for International Development: *Conserving Biodiversity: A Research Agenda for Development Agencies*. Washington D.C. (National Academy Press). 1992.

[29] BARBIER, E.B.: *Community-Based Development in Africa*. In: SWANSON & BARBIER (Eds.): *Economics for the Wild: Wildlife, Wildlands, Diversity and Development*. London (Earthscan). 1992. p. 104.

[30] "Every solution, every combination of property rights and controls, has its costs. Private property rights are not costlessly created, modified, and enforced; (. . .) What solution is best must surely depend to some extent on the relative costs of the possible solutions. Hardin ignores them. Common property regimes may make more sense than private property when these costs are taken into account: perhaps the countless groups that have regulated (some of) their resources as common property knew what they were doing!" TAYLOR, M.: *The Economics and Politics of Property Rights and Common Pool Resources*. Natural Resources Journal 32. 1992. p. 635.
Berkes and Farvar follow entirely the same line of thought in the introduction to the Berkes collection:

distinct from open access and from private property, but it can be a solution to the open access problem, even as private property is," Stevenson believes.[31] In the literature, numerous cases are analyzed, where collective property rights are preferable to private property rights: "Common property is the preferred solution to open access when the resource is unamenable to being split into individually controlled units, the control costs of sole ownership are prohibitive, or the technological characteristics of production (e.g. economies of scale) favor it over private property. It may also be preferred when social or cultural factors favor a group over an individualist solution."[32]

Rules for Use of Common Property

The main difference between resources for which collective property rights were allocated and open access regimes is that the former is regulated (in respect of both the group of entitled users and the rights of use by the group members); the latter, by contrast, is unregulated. If we now look at the institutional rules that counter overuse (the tragedy) within an effective common property regime, we see that the common property regime shares a great deal more similarity to private property regimes than to the unregulated condition of open access.

Elinor Ostrom has shown in various publications that the "dilemma of common property" can be successfully solved through institutional arrangements and cites various rules in light of their similarities.[33] From a similar perspective, Stevenson defines common property as a form of resource ownership with the following characteristics:

1. The resource unit has bounds that are well defined by physical, biological, and social parameters.

2. There is a well-delineated group of users, who are distinct from persons excluded from resource use.

3. Multiple included users participate in resource extraction.

4. Explicit or implicit well-understood rules exist among users regarding their rights and their duties to one another about resource extraction.

5. Users share joint, nonexclusive entitlement to the *in situ* or fugitive resource prior to its capture or use.

6. Users compete for the resource and thereby impose negative externalities on one another.

7. A well-delineated group of rights holders exists, which may or may not coincide with the group of users.[34]

These (and other similar) rules are ultimately interpreted within a collective property regime as an allocation of *individual rights of disposition* by the community. The difference between this sort of common property regulated by the community itself and private property, which

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"It is no coincidence that traditional resources management systems are often based on communities." BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-Based Sustainable Development*. London (Belhaven Press). 1989.

31 STEVENSON: Ibid., p.58.

32 STEVENSON: Ibid., p.76.

33 See also Elinor Ostrom's essay in this book.

34 STEVENSON: Ibid.,. p. 40.

ultimately also consists of a bundle of variously defined or limited rights of disposition thus seems less clear than the difference between open access and common property: the criteria to distinguish between private and common property is the *exclusivity* and the *range* of the respective rights of disposition, in other words, the difference is *slight*. The difference between open access and defined property rights (private or common property), by contrast, is the difference between an *unregulated* and a *regulated* condition. The difference is *fundamental*.

The difference between open access and common property with corresponding rules, in particular with respect to limited open access, is also analogous to categories of classic economics. These distinguish between purely public goods and so-called club goods, where the distinction lies in the rivalry surrounding consumption and the exclusivity of access to use. Accordingly, public goods are such that no one may be excluded from their use and there is no rivalry surrounding their consumption. Several subjects can use a good in equal measure without "taking something away" from the other. The classic example is the light of a lighthouse. Club goods, by contrast, also do not feature any rivalry but are accessible only to club members in respect to their use – the resources of a sports club, for example. The major difference between club goods and purely public goods is thus the availability or unavailability created by a process of exclusion.

What is important about this analogy is – particularly also with a view to the issues discussed in this collection – that in the ideal case of a good, for which there is no rivalry to consume, the condition of open access is not harmful. This is often mentioned in connection with the commons of the mind. Yet it is up to political economists of the commons of the mind to describe this phenomenon.[35]

[35] See also Yochai Benkler's essay *The Political Economy of Commons* in this book.

The Right to Read

Richard Stallman

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(from "The Road To Tycho", a collection of articles about the antecedents of the Lunarian Revolution, published in Luna City in 2096)

For Dan Halbert, the road to Tycho began in college—when Lissa Lenz asked to borrow his computer. Hers had broken down, and unless she could borrow another, she would fail her midterm project. There was no one she dared ask, except Dan.

This put Dan in a dilemma. He had to help her—but if he lent her his computer, she might read his books. Aside from the fact that you could go to prison for many years for letting someone else read your books, the very idea shocked him at first. Like everyone, he had been taught since elementary school that sharing books was nasty and wrong—something that only pirates would do.

And there wasn't much chance that the SPA—the Software Protection Authority—would fail to catch him. In his software class, Dan had learned that each book had a copyright monitor that reported when and where it was read, and by whom, to Central Licensing. (They used this information to catch reading pirates, but also to sell personal interest profiles to retailers.) The next time his computer was networked, Central Licensing would find out. He, as computer owner, would receive the harshest punishment—for not taking pains to prevent the crime.

Of course, Lissa did not necessarily intend to read his books. She might want the computer only to write her midterm. But Dan knew she came from a middle-class family and could hardly afford the tuition, let alone her reading fees. Reading his books might be the only way she could graduate. He understood this situation; he himself had had to borrow to pay for all the research papers he read. (10% of those fees went to the researchers who wrote the papers; since Dan aimed for an academic career, he could hope that his own research papers, if frequently referenced, would bring in enough to repay this loan.)

Later on, Dan would learn there was a time when anyone could go to the library and read journal articles, and even books, without having to pay. There were independent scholars who read thousands of pages without government library grants. But in the 1990s, both commercial and nonprofit journal publishers had begun charging fees for access. By 2047, libraries offering free public access to scholarly literature were a dim memory.

There were ways, of course, to get around the SPA and Central Licensing. They were themselves illegal. Dan had had a classmate in software, Frank Martucci, who had obtained an illicit debugging tool, and used it to skip over the copyright monitor code when reading books. But he had told too many friends about it, and one of them turned him in to the SPA for a reward (students deep in debt were easily tempted into betrayal). In 2047, Frank was in prison, not for pirate reading, but for possessing a debugger.

Dan would later learn that there was a time when anyone could have debugging tools. There were even free debugging tools available on CD or downloadable over the net. But ordinary

users started using them to bypass copyright monitors, and eventually a judge ruled that this had become their principal use in actual practice. This meant they were illegal; the debuggers' developers were sent to prison.

Programmers still needed debugging tools, of course, but debugger vendors in 2047 distributed numbered copies only, and only to officially licensed and bonded programmers. The debugger Dan used in software class was kept behind a special firewall so that it could be used only for class exercises.

It was also possible to bypass the copyright monitors by installing a modified system kernel. Dan would eventually find out about the free kernels, even entire free operating systems, that had existed around the turn of the century. But not only were they illegal, like debuggers—you could not install one if you had one, without knowing your computer's root password. And neither the FBI nor Microsoft Support would tell you that.

Dan concluded that he couldn't simply lend Lissa his computer. But he couldn't refuse to help her, because he loved her. Every chance to speak with her filled him with delight. And that she chose him to ask for help, that could mean she loved him too.

Dan resolved the dilemma by doing something even more unthinkable—he lent her the computer, and told her his password. This way, if Lissa read his books, Central Licensing would think he was reading them. It was still a crime, but the SPA would not automatically find out about it. They would only find out if Lissa reported him.

Of course, if the school ever found out that he had given Lissa his own password, it would be curtains for both of them as students, regardless of what she had used it for. School policy was that any interference with their means of monitoring students' computer use was grounds for disciplinary action. It didn't matter whether you did anything harmful—the offense was making it hard for the administrators to check on you. They assumed this meant you were doing something else forbidden, and they did not need to know what it was.

Students were not usually expelled for this—not directly. Instead they were banned from the school computer systems, and would inevitably fail all their classes.

Later, Dan would learn that this kind of university policy started only in the 1980s, when university students in large numbers began using computers. Previously, universities maintained a different approach to student discipline; they punished activities that were harmful, not those that merely raised suspicion.

Lissa did not report Dan to the SPA. His decision to help her led to their marriage, and also led them to question what they had been taught about piracy as children. The couple began reading about the history of copyright, about the Soviet Union and its restrictions on copying, and even the original United States Constitution. They moved to Luna, where they found others who had likewise gravitated away from the long arm of the SPA. When the Tycho Uprising began in 2062, the universal right to read soon became one of its central aims.

Author's Note

This note was updated in 2007.

The right to read is a battle being fought today. Although it may take 50 years for our present way of life to fade into obscurity, most of the specific laws and practices described above have already been proposed; many have been enacted into law in the US and elsewhere. In the US, the 1998 Digital Millenium Copyright Act established the legal basis to restrict the reading and lending of computerized books (and other works as well). The European Union imposed similar restrictions in a 2001 copyright directive. In France, under the DADVSI law adopted in 2006, mere possession of a copy of DeCSS, the free program to decrypt video on a DVD, is a crime.

In 2001, Disney-funded Senator Hollings proposed a bill called the SSSCA that would require every new computer to have mandatory copy-restriction facilities that the user cannot bypass. Following the Clipper chip and similar US government key-escrow proposals, this shows a long-term trend: computer systems are increasingly set up to give absentees with clout control over the people actually using the computer system. The SSSCA was later renamed to the unpronounceable CBDTPA, which was glossed as the "Consume But Don't Try Programming Act".

The Republicans took control of the US senate shortly thereafter. They are less tied to Hollywood than the Democrats, so they did not press these proposals. Now that the Democrats are back in control, the danger is once again higher.

In 2001 the US began attempting to use the proposed Free Trade Area of the Americas treaty to impose the same rules on all the countries in the Western Hemisphere. The FTAA is one of the so-called "free trade" treaties, which are actually designed to give business increased power over democratic governments; imposing laws like the DMCA is typical of this spirit. The FTAA was effectively killed by Lula, President of Brazil, who rejected the DMCA requirement and others.

Since then, the US has imposed similar requirements on countries such as Australia and Mexico through bilateral "free trade" agreements, and on countries such as Costa Rica through CAFTA. Ecuador's President Correa refused to sign the "free trade" agreement, but Ecuador had adopted something like the DMCA in 2003. Ecuador's new constitution may provide an opportunity to get rid of it.

One of the ideas in the story was not proposed in reality until 2002. This is the idea that the FBI and Microsoft will keep the root passwords for your personal computers, and not let you have them.

The proponents of this scheme have given it names such as "trusted computing" and "palladium". We call it "treacherous computing", because the effect is to make your computer obey companies instead of you. This was implemented in 2007 as part of Windows Vista; we expect Apple to do something similar. In this scheme, it is the manufacturer that keeps the secret code, but the FBI would have little trouble getting it.

What Microsoft keeps is not exactly a password in the traditional sense; no person ever types it on a terminal. Rather, it is a signature and encryption key that corresponds to a second key stored in your computer. This enables Microsoft, and potentially any web sites that cooperate with Microsoft, the ultimate control over what the user can do on his own computer.

Vista also gives Microsoft additional powers; for instance, Microsoft can forcibly install

upgrades, and it can order all machines running Vista to refuse to run a certain device driver. The main purpose of Vista's many restrictions is to make DRM that users can't overcome.

The SPA, which actually stands for Software Publisher's Association, has been replaced in this police-like role by the BSA or Business Software Alliance. It is not, today, an official police force; unofficially, it acts like one. Using methods reminiscent of the erstwhile Soviet Union, it invites people to inform on their coworkers and friends. A BSA terror campaign in Argentina in 2001 made slightly-veiled threats that people sharing software would be raped.

When this story was first written, the SPA was threatening small Internet service providers, demanding they permit the SPA to monitor all users. Most ISPs surrendered when threatened, because they cannot afford to fight back in court. (Atlanta Journal-Constitution, 1 Oct 96, D3.) At least one ISP, Community ConneXion in Oakland CA, refused the demand and was actually sued. The SPA later dropped the suit, but obtained the DMCA which gave them the power they sought.

The university security policies described above are not imaginary. For example, a computer at one Chicago-area university prints this message when you log in (quotation marks are in the original):

This system is for the use of authorized users only. Individuals using this computer system without authority or in the excess of their authority are subject to having all their activities on this system monitored and recorded by system personnel. In the course of monitoring individuals improperly using this system or in the course of system maintenance, the activities of authorized user may also be monitored. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of illegal activity or violation of University regulations system personnel may provide the evidence of such monitoring to University authorities and/or law enforcement officials.

This is an interesting approach to the Fourth Amendment: pressure most everyone to agree, in advance, to waive their rights under it.

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- An explanation of the White Paper: The Copyright Grab, Pamela Samuelson, Wired, Jan. 1996
- Sold Out, James Boyle, New York Times, 31 March 1996
- Public Data or Private Data, Washington Post, 4 Nov 1996. We used to have a link to this, but Washinton Post has decided to start charging users who wishes to read articles on the web site and therefore we have decided to remove the link.
- Union for the Public Domain—an organization which aims to resist and reverse the overextension of copyright and patent powers.

The New Enclosures of the Mind

Silvia Ribeiro and Pat Mooney[1]

HEINRICH BÖLL STIFTUNG NORTH AMERICA

You can fool some of the people all of the time; and, all of the people some of the time; but, you can't fool all of the people all of the time... However, you may be able to persuade enough of the people to monitor everyone all of the time.

Over 30 years ago, Oxford ethologist, Dr. Richard Dawkins, took sabbatical leave to write *The Selfish Gene*[2], one of the most disturbing books in a time of many disturbing books. Dawkins espoused the theory that human evolution is nurtured by numerous forces -- the gene, or DNA -- being only one. Human beings, Dawkins speculated, could evolve cultural memes[3] capable of Darwinian replication. It was an outlandish concept without "coat tails" -- at least that chapter of his book didn't attract many followers.

ETC Group would have given the idea of cultural memetics a pass were it not for a high-level meeting of US government officials, scientists, and industry held in Washington three months after 9/11 that made research into cultural memetics a priority. Then, two years later, a book by Britain's much-respected Astronomer Royal brought us back to memetics with his concern that it may be possible to medicate social attitudes and manipulate human nature.

But, the most compelling reason to track this potentiality is because it makes sense. If, as the UN University's 2005 State of the Future Report[4] suggest, we are entering the era of the Massively Destructive Individual - where anyone, anywhere could be devastatingly violent, using anything - then massive surveillance is, at best, a partial response. Aggressive surveillance will elicit a massive social reaction. Better than surveillance is surrender. If society can be cajoled into surrendering its information than the likelihood of a successful defense increases. Better still, if society can be convinced to surrender control over its own actions, then the world's dominating corporate/government partnership can sleep at night. Civil society needs to dissect the logic and the feasibility of all this...

Massively-destructive i**ndividuals**:

In 2003 Dr. Martin Rees, then Britain's Astronomer Royal and now the President of the Royal Society, made a bet that, by 2020, bioterrorism or Bio error will kill one million people. Rees stresses the importance of the individual as the new threat to our security. "We are entering an era," the astronomer says, "when a single person can, by one clandestine act, cause millions of

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1 Pat Mooney is the Executive Director of ETC Group, Silvia Ribeiro is a researcher with ETC Group, based in Mexico.

2 DAWKINS, Richard: The Selfish Gene. Oxford University Press, 1976. (second edition, 1989). See, especially, Chapter 11 and the endnotes to Chapter 11 written in 1989.

3 memetics: is a neodarwinian approach to evolutionary models of cultural information transfer based on the concept of meme (Dawkins used the term "meme" to describe a unit of human cultural transmission analogous to the gene, arguing that replication also happens in culture.) Memetics has turned into an approach in the study of self-replicating units for culture. It has been proposed that just as memes are analogous to genes, memetics is analogous to genetics.

4 GLENN, Jerome C. y GORDON, Theodore J.: *State of the Future*, United Nations University. 2005. http://www.millennium-project.org/millennium/sof2005.html#Table

deaths or render a city uninhabitable for years ….”[5] Suicide bombers, for example,- the "conventional" individual instrument of mass destruction -- were almost unheard of in 1975 but there were 43 in 2000, almost one a day in 2005 and considerably more than that today. [6]

Martin Rees and the United Nations University warn us to fear our neighbors… “… the nuclear threat will be overshadowed by others that could be as destructive, and far less controllable,” the President of the Royal Society advises, "These may come not primarily from national governments, not even from "rogue states," but from individuals or small groups with access to ever more advanced technology. There are alarmingly many ways in which individuals will be able to trigger catastrophe.”[7]

Of course, Rees is right. But, the political policy effect of the Massively-Destructive Individual is for society to surrender its rights to government and accept universal surveillance. If anyone can do anything then government will demand the authority to do anything to anyone.

Anything anywhere: The capacity to turn almost anything into a weapon has expanded enormously with the recent development of nano-scale technologies. Nanotechnology builds up from the level of atoms and molecules to create new materials with new properties - giving more credibility to the threat of MDIs. At a nanotech trade show in St. Galan, Switzerland in 2005, a company selling bulk nanocarbon tubes -- the poster child of the new technology -- told Hope Shand of ETC Group that his company only shipped the nanotubes a couple of kgs at a time since, in larger quantities, they tended to explode.[8] So what? According to one of the most watched videos on the Internet, if you drop Mentos Mints into a 2 L bottle of Diet Coke, it too will explode.[9] Yet, nanoparticles are something more than a school canteen joke. Aluminum oxide (an old-fashioned chemical compound long used by dentists to repair cavities is totally benign at the macro-scale but, at the nano-scale, it explodes and is being used by the U.S. Air Force to ignite bombs.[10] (The difference between macro particles of aluminum oxide and nanoparticles is the difference between nice teeth and no teeth!) Another presumably benign material, gold - used in rings and earrings not only for its beauty but because it is so inocous - is used as a catalyst when the gold molecule is between eight and 24 atoms in size, because it then becomes reactive. Above or below this number, gold is its usual passive self. If you have to choose between gold, aluminum oxide, Mentos Mints and Coke, only Coke can't be carried onboard an aircraft, due to new security regulations.) The point is that with nanotechnology it is not possible to rule out any conventional chemical compound as a potential weapon. This fact alone changes almost everything in defense strategic planning.

The corollary to ubiquitous explosives is that new communications technologies make it increasingly likely that almost anyone might be an individual of mass destruction. “Although modern technology allows instant worldwide communication,” Martin Rees warns, “it actually makes it easier to survive within an intellectual cocoon.” “…beliefs [are] reinforced by selective

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5 REES, Martin: Our Final Hour -- A Scientist's Warning: How Terror, Error, and Environmental Disaster Threaten Humankind's Future in This Century On Earth and Beyond. Basic Books. 2003.

6 Scientific American: "Fast Facts, Suicide Bombers”, January, 2006. citing : Scott Atran, the Jean Nicod Institute, CNRS; Bruce Hoffman, RAND Corporation.

7 REES, Martin: ibid. page 4.

8 Personal communication with Hope Shand, ETC Group Research Director following her presentation at the Nano-Fair in St. Galan, Austria in 2005.

9 The Economist, "The newspaper industry More media, less news” Aug 24th 2006.

10 PowerPoint presentation made by Tracy Hester, lawyer, at "Nano Days" at CBEN, Rice University, Houston, Texas, October 2004.

electronic contact with other adherents…" [11] As unhealthy as this might be for the individual -- and dangerous to society -- it provides governments with an excuse for intrusive surveillance.

Massively-monitored societies (MMS):

Civil society's concern about surveillance is deep, historic, and fetishist. Although some of us -- mostly in social movements in the Global South -- have legitimate reason to be wary (farm and indigenous leaders, trade unionists, and investigative journalists do get killed, after all) -- many of us in the North would be more dismayed if we were not monitored -- not sufficiently important -- not so strategically engaged -- as to warrant surveillance. The point here is not that surveillance is unimportant or that it is not threatening and debilitating to social justice -- but, that in the future, surveillance will be largely replaced by surrender.

The same year Richard Dawkins completed *The Selfish Gene* - the United States joined with Britain, Canada, and Australia to establish *Echelon,* a global telephone surveillance system.[12] Even at the time, most of us in civil society realized that there is a great difference between tape recording everything and being able to listen to - and make sense out of – anything. That time has passed. *Echelon* can now do both. And that's just the beginning...

In almost perpetual motion overhead, satellites and, even, lowly airplanes, equipped with remote-sensing devices, monitor national sovereignty, high-flying toxins, errant fishing trawlers, drug traffickers, and economic refugees. Today's infrared cameras register the signature of someone who has been in a coat or a bed several hours previous. Parabolic microphones eavesdrop on conversations a football field distant. A three-dimensional paraboloid can track sound waves back to a single focus. New technology can suck up speech from longitudinal vibrations transmitted through two window panes. [13] If you say it, someone can hear it.[14]

And, you can be followed. Across the Pacific from Japan, DARPA (the US Defence Advanced Research Project Agency) is researching a "digital insect" – a mobile, autonomous snoop that combines photo-rechargeable batteries with nanosensors for sound, and infrared and visible light, plus molecular detectors. The tiny platform would "narrowcast" its findings in digital microbursts to an off-site receiver. The military purposes are obvious but such technologies also offer huge profits on high Street. Imaging and recording technology has been nano-sized, cost-reduced, and mass-produced so that high-quality surveillance is commercially accessible. [15]

Spin-offs and spy-effects: One of the big changes since the end of the Cold War lies in the changed-relationship between the military and industry. It is now as likely that the consumer electronics industry will catalyze a military/surveillance technology shift as it is that military exigencies will eventually trickle down into consumer products. For example, the sensors first used to detect faint emissions from distant stars also allow the US military to detect guerrilla fighters and are now found in consumer digital cameras. Today, according to Martin Rees, the

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11 REES, Martin: ibid. page 6.

12 ATKINSON, William Illsey: "They're watching you." Globe & Mail, Toronto September 13, 2005.

13 All ideas in this paragraph can be found in: ATKINSON, William Illsey: ibid.

14 The uses of nanotechnology for military and civilian surveillance are discussed extensively in ALTMANN, Jiirgen, MILITARY NANOTECHNOLOGY - Potential applications and preventive arms control. Routledge Taylor & Francis Group, 2006.

15 ATKINSON, William Illsey: ibid.

demand for technological innovation is coming more from consumers than from Generals. [16] This multi-purpose approach is called COTS -commercial off the shelf technology. Spy satellites use COTS technology to resolve images down to 10 centimetres – powerful enough to read a license plate or see the smirk on an admiral's face. [17]

Nano soldiers: Over a third of the budget of the US National Nanotechnology Initiative has been spent on defence and military uses since it was initiated in 2001[18]. The military also funds nanotech research in Western Europe (e.g. Britain, Sweden), Israel, China, Malaysia, and India. Key military objectives for nanotech include fast biowarfare detection, stronger and lighter armour, more powerful explosives including triggers for mini-nukes, nanotechnologically improved soldiers and full 'information dominance' through nanotechnology.

Nanotechnology, in the words of India's President Kalam (himself a missile scientist), is expected to "revolutionize total concepts of warfare." It comes at a time when low intensity warfare and the 'war on terror' are a high political priority.

Tagged – You're It: The 9/11 factor has broken down any vestigial barriers between military and commercial surveillance. RFID (Radio Frequency ID) tags are tiny silicon chips that broadcast simple bits of digital data when a radio frequency is fired at a tag from up to 10 metres away. The smallest current RFID tags are the size of a grain of sand[19] and supermarkets such as Wal-Mart and Tesco now require that cases and pallets containing products bear RFID tags, to track inventory and prevent theft. In a few years, it is expected that individual products will also be tagged. RFID chips are already implanted in some cars, tires, credit cards, medicines, pets, prisoners and even passports (US passports incorporated RFID tags in 2006). Meanwhile, a US based company, Verichip, has produced an FDA[20]-approved tag that is implanted under the skin to provide access to medical records, VIP access to special locations or to track wandering seniors, kids or workers. Even smaller than RFID tags is a set of readable tags being developed by Nanoplex. Its nanobarcodes (striped nanoparticles) tags can be mixed into a material or sprayed onto it giving it a uniquely invisible code readable several meters distant.

While RFID tags are passive beacons of information, the big money is betting on tiny wireless sensors that actively gather information about their environment and transmit onward to a third party – "smart dust." Berkeley Robotics Lab has pioneered Smart Dust with US Defense Department funding. The lab's tiny autonomous wireless sensors (known as 'motes') can be dropped onto a battlefield to monitor troop movement, chemical toxins and temperature – relaying data to a command centre. While the original motes were penny-size, they have nano parts inside, and prices are dropping quickly as Intel, Motorola, Honeywell and others ratchet up production. The goal is to shrink the sensing components to the almost-invisible scale of a dust particle – allowing the military, the justice minister, or your mom – access to all the dirt.

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16 REES, Martin: ibid. page 79 at the footnote 79.

17 ATKINSON, William Ilssey: ibid.

18 National Nanotechnology Initiative: "Funding." <http://www.nano.gov/html/about/funding.html> - the actual figures are that DOD has received 1.219 billion dollars between 2001 and 2005 which is 30% of the 4.1 billion spent so far, however Aspects of Dept of Energy funding, NASA funding and Dept of Justice and Homeland Security are also defense related

19 Smartcode RFID Integrated Circuit was announced in Jan. 2004 – its is 0.25mm square – a barely visible speck of silicon – see <http://www.smartcodecorp.com/newsroom/13-01-04.asp>

20 FDA: The US Food and Drug Administration.

But, smart dust is also too passive since it doesn't get about much – without the aid of a high wind – which is why the University of Berkeley Robotics Institute is also working on insect sized flying robots that can carry wireless sensors. 'Robofly' will ultimately be a centimeter sized robot that flies and lands with the precision of a housefly. [21] While robofly doesn't actually fly yet, slightly larger autonomous spyplanes are already airborne. At the annual Micro Aerial Vehicle (MAV) competition, sponsored by defence aerospace companies, teams of engineers compete to create the smallest unmanned flying vehicle capable of transmitting video. So far the smallest MAV is 4.3 inches. [22]

A better approach to tiny mobile surveillance might be to do away with robots altogether and mount surveillance sensors directly on insects. Back in September 1997, the bio-robot department at Tokyo University constructed 'Roboroach' an ordinary cockroach with sensors implanted on its shell that allowed researchers to remotely control the direction in which it moved. Within a few years, but Japanese researchers say, electronically controlled insects carrying mini-cameras or other sensory devices could be used for a variety of sensitive missions – for rescue work crawling through earthquake rubble , or for slipping under doors for plain old industrial espionage." [23] Since the military in many countries, including the United States, have the legal ability to suppress patent applications and information, it is not surprising that research into biological -- including nano biological -- monitoring systems has dropped out of sight with the growth in public interest.

Surrender trumps surveillance:

But it is not what the government will do to us so much as it is what we are doing to ourselves. In a world where the massively-destructive individual is plausible, not even intense surveillance is a guarantee of security. Our help is necessary. The people are already surrendering vital information about themselves faster than governments can request it. In Britain and elsewhere cell phone/cameras with GPS systems are providing annotated photographs of neighbors and neighborhoods with incredible detail. This is not the future -- this is now. We are telling on ourselves.

CSO's have focused on surveillance and ignored social surrender. Using inexpensive, readily-available COTS technology, a US journalist recently drove his van around an upscale suburb picking up "nanny-cam" (home video monitor) signals that volunteered audio and visual information about the houses he passed.[24] Row upon row, suburbs and condos are providing real-time home movies of their owners' daily idiosyncrasies. Link these videos to the millions of others volunteered on youtube; the daily confessions poured out on Facebook and myspace; and the 100 million explicitly networked social patterns surrendered through Internet telephony like Skype and there isn't much you or your friends haven't told. Add this to the ubiquitous security cameras on subways, buses, street corners, and at checkout counters around the rich

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21 SQUATRIGLIA, Chuck: "Spy Fly: Tiny, winged robot to mimic nature's fighter jets." San Francisco Chronicle. November 2, 1999, p A17.

22 STILES, Ed: "UA Flying High after MAV Competition." April 15, 2004 <http://uanews.org/cgi-bin/WebObjects/UANews.woa/2/wa/EngrStoryDetails?ArticleID=9047>

23 TALMADOE, Eric: "Japan's Latest Innovation: A Remote-Control Roach." Associated Press. <http://www.intercorr.com/roach.htm>

24 ATKINSON, William Illsey: "They're watching you." Globe & Mail. Toronto September 13, 2005.

world and most urbanites are just a step away from starring in someone else's reality TV entertainment.

Not only are we spying on ourselves for others, we're footing the bill! In 2005, 150,000 people -- mostly in the United States -- ponied up $100 each to buy a test kit that would let them send a sample of their DNA to IBM. Together with The National Geographic Society, IBM has launched the Genographic Project to map human genetic diversity around the world. People paying the hundred dollars wanted to know if they were distantly related to Bill Gates or Attila the Hun. Industry wants to know as much about human genetic characteristics as possible. This absurd social inversion is taking place throughout health care. Dr. J. Craig Venter, (a controversial and famous geneticist since he led the private intiative to map the human genome) is offering a Grand Challenge prize to the first scientist who can map one person's genome for less than $1000. Soon, individuals will be able to go about with implanted microchips containing their own genome map. Once you have a microchip on your shoulder, who will be looking over it?

People will surrender their genomes because it will allow doctors to prescribe a wider range of medicines with the assurance that there is no genetic reason why these medicines could be dangerous. Over the past few decades, virtually thousands of drugs have been dismissed in the research process – or withdrawn from market – because a small percentage of the population experiences dangerous adverse reactions when they are taken. Individual genome maps will allow pharmaceutical companies to bring these shelved drugs back onto the market. The downside, of course, is that people will have to surrender their privacy to the pharmaceutical industry. We can describe this as either disease avoidance for the patient or risk avoidance for the insurance industry and employers. Even now, you can theoretically get your own map for a measly $20 million.[25]

The strongest privacy laws in the world can't prevent people from surrendering information about themselves – whether it be through "nanny-cams," cell phone cameras, or a DNA DVD in your forearm. Nor will laws do much good preventing neighbors from intentionally (or otherwise) tattle-tailing on neighbors.

If we're creating a "see-through society" what's the problem? Most of us have nothing to hide -- and, those that do -- most of the rest of us would want them discovered. This is only an argument if we ignore history. Abuse of power was not a feature unique to 20th century Fascists and dictators. There is a reason why an earlier generation fought so hard for the secret ballot and why the rich and powerful of their time fought so hard against it. But, there's not even a need to monitor anything if it is possible to manipulate the minds of theoretical terrorists or social dissidents -- or trade competitors.

Digital Democracies?

Is it not equally true that the new communications technologies can be used to advance democracy? In the early 1980s, while many environmentalists abhorred the rise of desktop computers, some issue activists embraced the technology and used the computational tool to analyze and out-organize both governments and industry. When ETC, former the Rural Advancement Foundation International, RAFI, got its first computers in 1982, it was roundly

[25] CHURCH, George M.: "Genomes for ALL". Scientific American. January 2006.

criticized by environmentalists in Germany. However, RAFI's ability to undertake an analysis of the collection and movement of crop germplasm end of gene bank storage standards was central to its success in forcing the UN Food and Agriculture Organization to establish a Commission on Genetic Resources in 1983. Similar stories are told by the Pesticides Action Network in their work monitoring crop chemicals. More dramatically, it was the use of radio cassette tapes in Iran in 1979 that made the Ayatollah Khomeini's revolt against the Shah possible. Ham radio operators working from their cars brought down Ferdinand Marcos in the Philippines in 1986. The fax machine organized global support for the protests in Tiananmen Square in China in 1989.[26] And the popular ousting of Philippine President Joseph Estrada in 2001 is credited to cell phone text-messaging. Cell phone monitoring at polling stations during the 2001 Senegal election is credited with keeping the vote honest and toppling the government there. Cell phones were also used to protect ballot boxes in the Ghanaian elections of 2000 and 2004.[27] In 2004, cell phone photographs sent by US military prison guards to friends back home found their way to the *Washington Post* and dealt a harsh public blow to the US government's credibility in Iraq.

These political events took place in the South – in countries with oppressive governments, managed media, and poor conventional communications. In each case, civil society's skillful use of new communications technologies leap-frogged over state controls. During the toppling of Estrada, for example, Filipinos were sending an estimated 45 million text messages a day, more than double the entire combined volume of the rest of the world at that time. The Philippines had barely 3 million fixed telephone lines but its 76 million citizens – even then – commanded over 4 million mobile phones.[28] Does Phone Power to the People mark a breakthrough point for democracy in the South?

About 80% of the world's people are now within reach of a mobile phone signal and 15% of the world is connected to the Internet. The ratio of Internet users in industrial and developing countries is narrowing and penetration rates have improved from 41 to 1 in 1992 to 10 to 1 in 2004[29] and, perhaps, 5 to 1 today. Shouldn't the revolution be at hand?

We've thought so before. The arrival of the telegraph – and, especially, the undersea cable – was at one time heralded as a profound democratic breakthrough - as is the Internet today. The truth would be found out, romantics proclaimed. Political and economic power would become transparent. In the end, of course, the telegraph wire served best to reinforce the political power of the countries that controlled the technology and the economic power of the corporations who came to dominate it. Within a few decades, Britain's Eastern Telegraph and

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[26] FERGUSON, R. James: "Lecture 10: Scripts for Cooperation and Protest: People Power, Low-Violence Strategies and Cosmopolitan Governance" 2005. <http://72.14.207.104/search?q=cache:viD5evHfn14J:www.international-relations.com/wbadvir/ADVIR-Lec10-2005.doc+manila+citizen+protests+in+2000+fax+technology&hl=en&gl=ca&ct=clnk&cd=50&client=firefox-a>

[27] CASTELLS, Manuel; FERNANDEZ-ARDEVOL, Mireia; LINCHUAN QIU, Jack and SEY, Araba: Mobile Communication and Society- A Global Perspective, MIT Press. 2007.

[28] CHANDRASEKARAN, Rajiv:."Philippine Activism, At Push of a Button: Technology Used to Spur Political Change," Washington Post Foreign Service. December 10, 2000. Page A44.

[29] GLENN, Jerome C. & GORDON, Theodore J.: 2005 State of the Future. Washington D.C.: American Council for the United Nation's University, 2005. p 22.

the US's Western Union ruled the wires.[30]

Likewise, the radio: when the airwaves first became available to virtually everyone with any technical competence, some thought the revolution was at hand. After all, how could governments exercise control over the air? Many predicted an era of unrestricted free speech and free information that would finally make it possible for the people to exercise true democracy. But, from the beginning in Europe, governments took control of the technology and prohibited access to the airwaves to all but approved parties. By the mid 1920s in the United States, the crowded airwaves forced the US government to step in and organize band width.[31] But by the beginning of the Great Depression – when social unrest was soaring to new heights – the freedom of the airwaves had ended. [32]

There were similar hopes for cable television as, in the late '60s and early '70s, community organizations in North America and elsewhere organized to establish local channels designed to strengthen communities and democracy. Those cable channels still continue today – but nobody is watching. The cable networks have been merged into the original television systems and then hyper-merged into cinemas, radio, newspapers, magazines, and the Internet.

What can citizens honestly expect from the Internet and other communication technologies when their basic structure is controlled by the US military? At any given moment there are 7 million people chatting on Skype. But Skype is controlled by the Internet which is controlled by the US military. And, in 2005, Skype was bought by eBay and Rupert Murdoch, bought myspace. A year later, Google took over youtube. Today, the latest Internet rage -- Facebook -- may soon become someone's subsidiary.

Atoms for Piece -- Social engineering for pacification?

Prof. Jacob Hamblin of Clemson University makes it clear that social engineering is not a post 9/11 invention. As far back as 1930 social scientists -- concerned that the aftermath of the Industrial Revolution and the predicted revolution in automation would destabilize industrial societies -- argued for the need to manipulate the social conscience in order to maintain progress as well as law and order. Among the major proponents of social engineering was the International Committee on Mental Hygiene. Prominent social scientists posited the theory that social problems were a matter of "psychological maladjustment". The International Committee morphed into the World Federation on Mental Health under the leadership of Canadian psychiatrist, G. Brock Chisholm, who was also the first Director-General of the World Health Organization. When the newly-elected US president Dwight Eisenhower addressed the UN General Assembly in 1953, the President launched his "Atoms for Piece" initiative and, probably unintentionally, catalyze a feeding frenzy within the UN "family" of agencies for leadership in the initiative. Ultimately, UNESCO lost out to the US-inspired International

30 SPAR, Debora L.: Ruling the Waves: Cycles of Discovery, Chaos, and Wealth from the Compass to the Internet, Chapter 2 – The Codemakers., Harcourt Inc: New York. 2001.

31 STARR, Paul: The Creation of the Media: Political Origins of Modern Communications. New York: Basic Books 2004. As reviewed by Wade Roush in Technology and Culture. April 2005. 46(2): 417-418.

32 SPAR, Deborah L.: ibid.

Atomic Energy Agency. Nevertheless, UNESCO joined forces with Chisholm's organization, the World Federation for Mental Health, to examine ways to guide and control scientific debate over the risks of nuclear energy and to allay widespread public concerns. According to UNESCO and the WFMH, setting aside public alarm was all a matter of reorganizing education and media management. The social scientists talked in terms of "behavioral modification" for whole societies and "psychiatric therapy" for the world in order to help humanity adjust to new technologies. The idea that scientists could work with the education system and the mass media to reshape society and social attitudes was pervasive well into the 60s when the social movement against racism, disaffection with the Vietnam war, and distrust over environmental deterioration swept it aside.[33]

Memes and democratic dissent:

Is it really possible to externally direct the evolution of a human culture? Hopefully not. Is it possible that governments will attempt this kind of manipulation? Yes, it is. And, like it or not, successful or not, the very attempt would prove hugely disruptive. If the initiative itself is incredible, the attempt is credible and civil society should be vigilant.

Remember cultural memetics. If there is any truth to the notion of a massively-destructive individual -- or, if ruling elites believe it to be possible -- or, if it is in their interest to convince society that MDI's are a threat -- then the logical "first response" is to establish a ubiquitous surveillance system monitoring everyone everywhere. Since aggressive surveillance inevitably stirs opposition, the best strategy is to create a see-through society that happily surrenders information.

Even back in the mid-70s, Dr. Richard Dawkins would have argued that government manipulation leading to such a societal surrender is already a "meme". Cultural memes are already developed and directed through the mass media and public education. Sit-coms and curricula have been enormously successful in creating new social norms. Some of these - such as an aversion to smoking, acceptance of sexual orientation, or antipathy to drunk driving -- have been obviously beneficial. Others -- such as the demeaning of indigenous knowledge, the denial of global warming, or the dismissal of sustainable livelihood strategies in favor of consumerism -- have been obviously destructive. All of these represent "soft" memes.

Medicating memes: There are, in theory, other possible manufactured memes that could prove much harder. Arguably the most respected scientist in the United Kingdom, Martin Rees warns, "…human character may be changed by new techniques far more targeted and effective than the nostrums and drugs familiar today…" "By mid-century…[people may] have different attitudes from those of the present (maybe modified by medication, chip implants, and so forth)" "Nongenetic changes could be even more sudden, transforming humanity's mental character in less than a generation, as quickly as new drugs can be developed and marketed. The fundamentals of humanity, essentially unaltered throughout recorded history, could start to be transformed within this century."[34]

That the world's corporate/government partnership might contemplate the use of drugs or

[33] HAMBLIN, Jacob Darwin: Exorcising Ghosts in the Age of Automation United Nations Experts and Atoms for Peace. In: Technology and Culture. vol.47 No.4, 2006.

[34] REES, Martin: ibid. pages 2-13.

cogular implants to advance their social control should not be surprising. Already,, all forms of unhappiness or discontent are interpreted as a personal medical problem. It is not that citizens are unemployed or underemployed that is wrong, it is that they are depressed about it. There is a pill for that. It is not that there is too much stress, too much social upheaval, too much pollution that is the problem, it is that these things bother us. There is a pill for that. It is not that our bosses demand too much of us, it is that we need too much sleep or can't quite meet the rising bar of employer expectations. There are pills that can reduce our sleep requirement or enhance our memory or help us think faster. It is not that industry and government need to adjust, the people need to be adjusted.

If a baby gets a cogular implant for memory enhancement or an implant to end deafness, will the send/receive icon sport a transmittable "security" override?

e-Brains? Closely related to the concept of cultural memes is the potential for neuroscientists to understand -- and adjust -- memory. Dr. Eric Kandel received the Nobel Prize in medicine in 2000 for just such work. Kandel traced memory in the simple *Aplysia marine* snail -- following the neurological pathway from the initial sensation to the storage of the sensation's memory in a pattern of electrical and chemical connections that could be pinpointed and, theoretically, manipulated. Scientists now believe they may be able to do the same for humans - helping patients overcome psychic trauma by dulling or eliminating the memory of terrible events. There are, of course, other potential uses less benign.[35] Two researchers at the Neurosciences Institute in San Diego, USA engineered a 30-fold increase in the aggressivity of the famous fruit fly by boosting the presence of an enzyme -- CYP6a20 -- coded by a single gene. It's unusual for a characteristic like aggressiveness to be traced to one gene but it is probably more interesting that fruit flies share a quarter of their DNA with human beings.[36]

Epic inheritances? It is, of course, much more interesting if the brain can be re-wired so that cultural memes are passed on from one generation to the next. If it is possible to manipulate how -- or what -- we think, could these altered neural patterns be inherited? Researchers at Umeå University in Sweden think maybe so. Together with colleagues in the UK, they have discovered that epigenetic changes -- chemical changes to DNA such as additional methyl groups - brought about among pre-pubescent youngsters through nicotine or alcohol can be passed onto their children and grandchildren. A long-term survey of British men revealed that early smokers passed on epigenetic changes to their sons and grandsons that led to obesity and other health problems. Another survey in northern Sweden showed that grandparents who were frequently hungry between ages.

Parasitic memes: 30 years ago, Richard Dawkins wasn't just talking about these soft or mechanical memes. Dawkins speculated on -- but neither promised nor prophesied -- the development of viral or parasitic memes that could literally control some facets of human cultural evolution. In early December, 2001 -- coincidentally less than three months after 9/11 – the US Department of Commerce (DOC) and the National Science Foundation convened a meeting of scientific experts, industry, and senior US government officials under the auspices of the White House, on the theme, "Converging Technologies for the Enhancement of Human Performance." The NSF's Dr. William Baimbridge talked about "cultural memetics" (Richard Dawkins old theory) that it may be possible to map– and predict – the neurological behavior of a culture or community (or individual) and then either adapt or, at least, anticipate responses to

35 The economist: "Science of the mind: protein memories", March 2, 2006.

36 New Scientist: "Single gene turns fruit flies into fighters", 19 August, 2006.

stimuli. Possibly the greatest area of scientific progress in the last decade has not been in nanoparticles or genome mapping but in neurosciences. Researchers are learning to follow the neurological pathways from senses to one (or several) responding parts of the brain. They are also learning how to grow neurological connections and redirect impulses. Publicly, the purpose of this research is to help those in chronic pain, to suppress anxiety, or to vanquish addictions. But, the same research could wipe away fear in soldiers or induce apathy among anti-globalization protesters.

The papers and conversation in that December Washington meeting pretty much say it all... "…the classic problem of social science has been to understand how and why some people and groups deviate from the standards of society, sometimes even resorting to crime and terrorism," William Bainbridge and Gary Strong of the National Science Foundation told their audience, "…deep scientific understanding of the memetic processes that generate radical opposition movements may help government policymakers combat them effectively."[37]

Not all the discussion focused on suppressing violence. In the aftermath of the Seattle WTO debacle, the NSF and Department of Commerce were also concerned about economics... "A science of memetics, created through the convergence of many existing disciplines, would likely give a basis for understanding the relationship between social groups and globalization — a topic of enormous recent interest. Fundamentalist groups are no longer 'fringe,'" the NSF's two researchers asserted, "as they practice tactics to deal with variety and change, and they have become a topic not only for cultural anthropologists but also for law enforcement and governments in general. Certain "ideas" may have the force of a social virus…" they went onto warn that some "ideas" can spread "…as quickly and can have as deleterious effects on a population as do biological viruses." [38]

What to do? According to the assembled scientists and bureaucrats in the Washington meeting, "If we had a better map of culture, analogous to the Linnean system that classifies biological organisms into species and genera, we could help people find the culture they want and we could locate "uninhabited" cultural territories that could profitably be colonized by growing industries." "Memetic science," the policy advisers opined, " could help us deal with challenges to American cultural supremacy…" [39]

Although Bainbridge and Strong were not claiming to express the views of the US government, the executive summary of the NSF/DOC report stresses that "highest priority" was given by the attending government and industry officials to their proposal for a Human Cognome Project -- a plan to map the neurons and memes of the human brain just as the Human Genome Project mapped our DNA. [40]

Gondii no Gandhi: Is it really possible for neuroscientists to change the way people think or behave? Can a culture be changed? It was the idea of creating parasites or neural viruses --

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37 STRONG, Gary W. & BAINBRIDGE, William S., National Science Foundation: "Memetics: A Potential New Science", in Converging Technologies for Improving Human Performance -- Nanotechnology, Biotechnology, Information Technology, Cognitive-sciences. pages 179 – 186. National Signs Foundation/Department of Commerce-sponsored report (June 2002) ROCO, Mikkail & BAINBRIDGE William S., editors.

38 STRONG, Gary W. & BAINBRIDGE, William S.: ibid.

39 STRONG, Gary W. & BAINBRIDGE, William S.: ibid.

40 ROCO, Mikkail & BAINBRIDGE, William S., editors: Converging Technologies for Improving Human Performance -- Nanotechnology, Biotechnology, Information Technology, Cognitive-sciences. P. 318-325, National Signs Foundation/Department of Commerce-sponsored report (June 2002).

today's counterparts to computer viruses -- that originally attracted Richard Dawkins to the plausibility of cultural memetics. There is considerable evidence in the natural world that the brains of everything from insects to mammals are routinely "turn around" so that creatures are manipulated to do the bidding of another species - even if it means committing suicide. Oxford researchers (not Richard Dawkins) have discovered a tiny parasite, *Toxoplasma Gondii*, that makes mice fatally-attracted to cats. The parasite manipulates rats to carry it to its preferred host, cats. It is dormant in rodents but reactivated when gobbled up by the cat.[41] Researchers in Montpelier report that hairworms that grow inside grasshoppers take over their brains secreting proteins that drive the grasshoppers to drown themselves in water when the hairworms need to mate.[42] New Zealand researchers have found that cockles infected by *Curtuteria Australias* are used to return the parasite to birds. The parasite stops the cockles from burrowing in mudflats, forcing them to remain on the surface as prey for the birds.[43] Then consider the remarkable case of the lancet liver fluke (*dicrocoelium dendriticum*) that lays its eggs in the liver of cows and sheep. The eggs are excreted and consumed by snails where they reproduce in the snail's digestive gland and are excreted again. Ants eat the excreted snail slime and become controlled by the parasite. When the sun sets and temperatures drop, the ants are compelled to leave the colony and climb blades of grass to wait to be eaten. This process is repeated nightly until the ants are consumed. Safely inside the cow or sheep, the parasite returns to the liver to lay its eggs once more.[44]

The ability of parasites to manipulate the minds of grasshoppers and mice may not seem like a "proof of principle" that the cultural or political attitudes of humans could as easily be "re-educated". Yet, *Toxiplasma Gondii* has already infected human beings and some researchers controversially claim that it is the cause of some abnormal behavior patterns such as promiscuity in women and violence in men.[45]

We are not suggesting that governments are about to nano-engineer new bacteria or viruses that will be slipped into our water pipes or grain silos to make sure we all vote "right" in the next election. We only suggest that the age-old exigency of ruling elites to modulate the will of the People to their own ends has not only not gone away but may have powerful -- and unanticipated -- tools to achieve this goal. As worrisome as surveillance may be, societal surrender and the various forms of cultural memetics demand civil society attention. Unless the People seek a social policy solution to social justice issues, the threat of massively-destructive individuals may coerce "all of the people" into placing themselves under the control of others

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41 BERDOY, M.; WEBSTER, J.P. and MacDONALD, D.W.: "Fatal Attraction in Rats Infected with Toxoplasma Gondii." Proceedings. Biological Sciences/The Royal Society. United Kingdom: Oxford University Veterinary Services. 267(1452). Aug 7, 2000. pp 1591-1594.

42 OWEN, James: "Suicide Grasshoppers Brainwashed by Parasite Worms" National Geographic News - September 1, 2005. <http://news.nationalgeographic.com/news/2005/09/0901_050901_wormparasite.html>

43 McFARLAND, L.H.; MOURITSEN, K.N. and POULIN, R.: "From first to second and back to first intermediate host: the unusual transmission route of *Curtuteria australis* (Digenea: Echinostomatidae)." Journal for Parasitology. 89(3). June 2003. pp 625-628.

44 PEACOCK, Andrew: "Animal Diseases Factsheet –Publication AP059 – *Dicrocoelium dendriticum* - The Lancet Fluke of Sheep." Government of Newfoundland and Labrador. <http://www.nr.gov.nl.ca/agric/animal_diseases/domestic/pdf/dicro.pdf>

45 LAFFERTY, Kevin, "Can the common brain parasite, *Toxoplasma gondii*, influence human culture?", *Proceedings of the Royal Society*, UK, Proc Biol Sci. 2006 noviembre 7; 273(1602): 2749–2755.

"all of the time".[46]

[46] For an updated discussion on the use of new technologies including the Internet to disrupt elections and distort public opinion, see: ANDREJEVIC, Mark: iSpy - SURVEILLANCE AND POWER IN THE INTERACTIVE ERA. University Press of Kansas. 2007.

The Guardians of Our Future:

Territorial Management in Gurupá*

Jean Pierre Leroy[1]

Beyond the much-debated options of public or private property, local peoples and communities experience and propose their own alternatives. In the year 2000 the Brazilian Amazon had, according to the Brazilian Geography and Statistics Institute (IBGE), a population of 21 million, with 6,680,695 living in the rural area, which is a gross underestimate.[2] The IBGE estimates that in 1999 there were 175,000 indigenous persons in the Brazilian Amazon.[3] This number must have increased sharply given the birth rate and rediscovery of their indigenous identity on the part of the social groups identified up until that time as *caboclos*, i.e. mestizos of white and indigenous origin residing in the rural areas of the Amazon region. There are likely one million[4] or more extractivists, collectors of latex, cashews, heart of palm, fruits such as *açaí* and *babaçu*, essences, and other products of the jungle. River dwellers and fishermen, *quilombolas* and *caboclos*, are all part of a population historically so rooted that they attribute to themselves – and it is recognized as attaching to them – the qualifier "traditional." We should add to them the peasants who arrived in the region little by little over the centuries, and massively during the colonization process promoted by the military governments, from all corners of the country, in particular from the south and the northeast. These peasants contributed to the destruction of the jungle, but today many small producers have embraced diversified and ecological production, appropriate for the Amazon, which distinguishes them from the medium and large producers engaged primarily in stock-raising and monoculture. However, for many, beginning with the *colonos* of the 1970s, and those recently settled thanks to the agrarian reform, cast into the jungle, without highways, far from the markets, the only alternative that remains is to sell the hardwoods of its forests to logging companies.

It is they who have historically managed the natural resources of the Amazon region and, therefore, of humanity. I believe that without them there will be no salvation for the Amazon region, as their ways of using and managing the forest and water resources, not only economically but also culturally and symbolically, require that biodiversity be maintained. That does not mean that they should be frozen in time. They want to enjoy the services that modern society can offer, and therefore they need to economically guarantee their family reproduction. It is not a question of placing them in opposition to the dominant economic strategies – past *vs.* future – for managing the ecosystems from which they derive their subsistence is complex if one wishes to go beyond the system of extensive production, harvest, hunting, and fishing, which is not suitable for guaranteeing a contemporary standard of living.

Many communities have rules, hidden or explicitly agreed upon, where, for example, the

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* Dedicated to journalist Lúcio Flávio Pinto of Pará, who wrote *Amazonia. O anteato da destruição.* 2nd ed. Grafisa, Belém. 1977.

1 The author is an educator and coordinator of environment at FASE, author of *Uma chama na Amazônia*. Vozes, Rio de Janeiro. 1991.

2 All the inhabitants of the large towns and cities are counted as urban population, even as many of them are engaged in essentially extractive and/or agricultural activities.

3 www1.ibge.gov.br/brasil500/indios/numeros.html

4 www.ibama.gov.br/resex/textos/h12.htm

curupira (mythical entity that restricts access to the jungle for hunting to certain times) is more important than the legislation and community agreements, more than the boundaries registered with a notary public. They have traditionally combined the private and the common in ideal fashion. But that's not enough since the arrival of the *grileiros* (persons who try to take over the lands of others by means of false deeds) and large projects, and access to public resources and markets, forces them to delimit their lands lest they lose them or become economically unviable.

Among hundreds and thousands of examples, we take that of Gurupá, a municipality of Pará situated in the Lower Amazon, in the "Islands Region." It has an area of 8,578 km2, and in 2005 it had a population of 23,000, of whom 16,500 lived in the rural area, 23.3 percent on the mainland, and 58.2 percent in the *várzea*.[5] That population makes a living from peasant agriculture (producing cassava, corn, and rice); small-scale logging, using family-owned sawmills); heart-of-palm and *açaí*; hunting and fishing; fruit and vegetable gardening; and raising small animals. That population is mestizo, a remnant of the rubber era, and black, a remnant of the *quilombos*. In the *várzeas*, the land- use system is family-based. In the mainland region, natural resource use tends to be collective. In both cases there is a strong sense of cooperativism. The hunting and fishing seasons are defined by custom, based on an understanding of the need for reproduction of the animals, fish, and shrimp, and on the social hierarchies in the community. The places for shrimping are "inherited," but are available for others if not used by those who've inherited them. The logging areas are informally defined and attributed to the families that live within them, although access to those areas is free for any other person from the community who wishes to gather other products of the jungle or hunt. Those who do not exploit the timber on a commercial basis may also cut trees for their own needs. The rules on the use rights over nature are always oral, not codified in written texts, passed down from generation to generation, and perpetually adapted. Some communities begin to document this set of community laws as a tool for regularizing land tenure, forest management, and water resources management.

This natural resource management and subsistence agriculture ensured both the conservation of the islands' ecosystem and the reproduction of these families for at least a century. We could speak of success if its continuity were viable. Yet the families, beginning with the youth and women, aspire to the services the city offers. At the same time, the price of their products is too low to compensate for the distance from the city, by the rapid river transport that brings urban services and goods to their communities. Worse still, as of the 1980s the logging companies, legal and illegal, began as to enter the lands that until them were considered as *devolutas*[6] and to want to appropriate them. Other supposed owners, whose titles turned out to be false, began to pressure the inhabitants to abandon their lands or pay a tribute, or else lose access to the natural resources and be expelled; this was the moment when the inhabitants of Gurupá had to transform that informal space in which they lived into a "territory." According to anthropologist Alfredo Vagner, "territoriality operates as a factor of identification, defense, and strength."[7]

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5 TRECCANI, Girolamo Domenico et al.: "*Gurupá: Regularização Fundiária e manejo dos recursos naturais"*. In: Proposta. Quarterly publication of FASE. *Terra: Reforma Agrária e direitos territoriais*, May 10, 2005. No.107/108. Rio de Janeiro, FASE.

Várzea is the flatland along the banks of a river that is flooded during the rainy season.

6 Unoccupied lands that were not appropriated by private persons or formally by the government authorities.

7 Alfredo Wagner Breno de Almeida. "*Terras tradicionalmente ocupadas. Processo de territorialização e movimentos sociais".* In: *Estudos Urbanos e Regionais. Revista da Associação Nacional de Estudos Urbanos e Regionais – Anpur.* Vol. 6, No. 1, May 2004, Rio de Janeiro. www.anpur.org.br

Following him, we can characterize community territories not only by their boundaries, but also by community control and management of their natural resources. Through the social construction of their territory they created or reinforced their collective identities as *quilombolas*, fishermen, and extractivists, a necessary condition for winning the right to a territory, and to maintain it. The legal instruments offered by the Brazilian Constitution and by statutory provisions were no doubt determinant for that process of institutionalizing common territories. That is what we will examine next.

Brazil's National System of Conservation Units[8] (SNUC) takes in a vast array of forms of conservation divided into two groups: conservation units for comprehensive protection, and those for sustainable use, from Biological and Ecological Stations (in which the human presence is excluded) and National Parks, including the National Jungles (FLONAS) (which can be exploited), to areas such as the Extractivist Reserves and Indigenous Lands. The current federal administration, and, to a lesser extent, some state governments that incorporate environmental concerns to their agenda, maintained and accelerated a policy of creating new conservation areas, and created new legal definitions. This is the case of the Communities of Quilombos, which resulted from the reform of the 1988 Brazilian Constitution, the Projects for Agro-Extractivist Settlement (PAE: Projetos de Asentamento Agroextrativista), and the Forest Settlement Projects (PAF: Projetos de Asentamento Agro-Florestal), created by the National Institute for Colonization and Agrarian Reform (INCRA).

The need to preserve their rights and their ways of life and reproduction led the inhabitants of the rural and forest areas of Gurupá, with the assistance of a non-governmental organization, FASE, to try to define, delimit, and legalize their territories.[9] That process of collective regulation of the land, which extended over more than a decade, led, as partially shown in the attached map, to a wide array of forms of possession and ownership: Extractivist Reserve (Resex) (area 6 of the map), Sustainable Development Reserve (area 5), Agro-Extractivist Settlement Project (PAE) (area 3), Communities Remnants of Quilombos (areas 1 and 2), Assignment of Use Contract (areas 4, 8, and 9)[10], and Family Regularization of Land Tenure (area 7). Each choice was made taking into account the ecological reality of the place, the ways of life and forms of production of the population, their desires, and the legislative arsenal available. Family regularization of land tenure is the only case of individual title to the land, in which each family becomes the owner of its lot. The *quilombolas* receive collective property rights to their land, their associations receive definitive title.[11] The Resex lands continue to be "property of the federal government," "government-owned, with use rights granted to the traditional extractivist populations," who are granted "permanent possession."[12] Agro-Extractivist Settlement Projects are based on a "contract for the right of use of real property … for a period of 30 years"[13] assigned to the Association, which brings together the 24 families of

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8 Instituted by Law No. 9985 of July 18, 2000. See: http://www.mma.gov.br/port/sbf/dap/doc/snuc.pdf

9 The following fragment is excerpted from: TRECCANI, Girolamo Domenico *et al, op. cit*.

10 This last legal form is due to the fact that the lands affected by the tides remain flooded several hours a day, called *igapo*, cannot be appropriated. The federal government can only sign Assignment-of-Use Contracts with the local communities for a set period of time.

11 See: TRECCANI, Girolamo Domenico: *Terras de Quilombo. Caminhos e entraves do processo de titulação*. Belém. Executive Secretariat of Justice, Roots Program. 2006.

12 BRENO DE ALMEIDA, Alfredo Wagner: *Terras de quilombo, Terras Indígenas, "Babaçuais Livres". "Castanhais do Povo", Faxinais e Fundos de Pasto.Terras tradicionalmente ocupadas.* Manaus, Colección (Tradição e Ordenamento Jurídico), Vol. 2. New Social Cartography of the Amazon Project, Manaus. PPGSCA-UFPAM, Ford Foundation. 2006. p. 61.

13 The State continues to be the owner and signs a contract with the inhabitants, guaranteeing them the use of

the community. The Sustainable Development Reserves are "government-owned." The 190 families of the five communities signed a "Contract for the assignment of use of Public Lands." That modality of the SNUC has yet to be regulated.[14]

It is important to note that all these forms place limitations on the use of the land for the purpose of conserving the forest and/or water resources system. All maintain the notion of collective territory. All imply the need for the existence of legitimate and active community organizations. All provide for the participation of the communities in their management, and preserve the customary rules, even if they may need to be adapted.[15]

This text conveys only a limited notion of the complexity of the historical and cultural realities in question, yet it is sufficient for getting a sense of how far they are, on the one hand, from the notion of individual private property, and, on the other hand, from the notion of territory defined by its legal and administrative limits, which presents a space as a homogenous whole, and its inhabitants as being from one or another municipality and state.

In addition, the boundaries, even when registered with a notary public, are not sufficient in the case of poor communities. Such a territory is maintained on condition that its inhabitants are capable of exercising control and in fact have power over it. Such control entails administering the territory and the forms of management that make the inhabitants recognized by the surrounding society and authorities, preventing intruders and even the inhabitants themselves from diverting the natural resources to other uses, thereby enabling them to live better and establish roots. In other words, one must constantly guarantee the conditions for the communities to maintain and reproduce on their own, and to ensure protection of the commons. In this regard, Alfredo Wagner notes that those territories are "units of mobilization."[16] The communities involved are not devotees of the past, trying to cling to archaic ways of life. They are engaged in an evolutional process involving permanent adaptation, seeking the most appropriate ways to project themselves into the future without renouncing their values or culture. Yet since this places them opposite the dominant trend of privatization and unbridled exploitation of nature, their territories become, potentially or *de facto*, political territories that require permanent mobilization.

Now, as the Ministry of Environment seeks conservation, most of the Brazilian government's action is geared to reproducing, in the Amazon region, the same predator model in place in the rest of the country. Might the coexistence of a "natural nature" that must be preserved, and which therefore is the subject of all the efforts and policies of the Ministry of the Environment, and the "regular nature,"[17] the rest of the territory, turned over to the cruel ravages of destruction, be possible?

Gurupá is an example of "nature preserved," alongside neighboring areas that were turned over to destruction. It is a paradigm of community management of forest products, particularly timber (management plans, density of species, programmed cutting cycles) and essences,

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the area delimited within one of the forms of use defined in provisions referring to the projects of agro-extractivist settlements, for a period of 30 years. It is noteworthy that some measure of insecurity persists. If in the next 30 years a shameless government should come to power….

14 See: www.wwf.org.br. Sustainable development reserve. Guidelines for regulation.

15 There are no indigenous peoples in Gurupá. While the Indigenous Lands continue to be "federal property" the indigenous peoples whose rights to land were confirmed are guaranteed "permanent possession and exclusive usufruct of the natural resources. Almeida, ID, *Id*. p. 61

16 *Id*. p. 71.

17 ACSELRAD, Henri: "As práticas espaciais e o campo dos conflitos ambientais". In: ACSELRAD, Henri (ed.): *Conflitos ambientais no Brasil*. Rio de Janeiro. Relume Dumará. 2004.

particularly by women, and management of shrimp in the streams. Yet the future is uncertain, not only because of the pressure brought to bear by those who would like to transform the municipality into privatized "regular nature," so as to extract all its timber, making way for stock-raising, but because the economic survival of the inhabitants of the jungle and of the waters is not guaranteed. Everyone knows that in theory the "standing jungle" is more valuable than the land after its destruction. Nonetheless, in practice, that thesis has yet to be perfectly verified. Gurupá seeks to confront those challenges with initiatives for making use of forest waste to obtain pieces for marquetry, the manufacture of musical instruments such as guitars and *cavaquinhos*, and furniture-making.

The government tries to partially address this matter through a law that ties the market to the State. The "Law on the Management of Public Jungles for Sustainable Development"[18] allows private companies and community associations, through community management, to exploit the timber of the Amazon jungle in sustainable conditions, awarding them long-term concessions and creating conditions for this purpose. This combination of public, community, and private interests needs to prove its effectiveness. And the criterion for assessing whether it is effective will be the capacity for protecting common resources, and for reproducing and maintaining the vitality of the communities.

Who can guarantee us that the loggers who operate illegally are not going to continue their activities in other areas, competing with costly and hardly profitable exploitation, comparing it to homogeneous forest? Will there be sufficient oversight to inhibit those practices and to verify the virtue of those to whom the concessions are awarded? Will the agro-extractivists really be given the opportunity to become viable economic actors? Or will they be considered mere beneficiaries of marginal social policies?

Ensuring the future of the peoples and populations of the jungle, and with them this exceptional biomass, has a price that should be paid by society as a whole. They are guardians of our future and, as such, provide us an environmental service; a public service, a service of preserving and defending a "common good," it should be noted, and not an environmental service subject to the rules of the marketplace.

Recognizing that these populations perform that function, and acknowledging their place as economic subjects, and not as persons assisted by compensatory policies that reinforce their dependence on the favors of the local political and economic powers-that-be, and who take away their dignity, means recognizing their status as citizens and the possibility of exercising that citizenship. That status and that exercise are essential in order to agree upon a project for the Amazon that will make it possible to bring a halt to the ravages of capital.

If the market sectors called "high-tech," allied with techno-science, already order "post-humanity" and the "post-world" and think they can dispense with that anachronistic idea of common and community, there is no doubt but that they do provide no place for the majority of those who live in the Amazon region. It is up to them, and others with them, to continue the struggle so that what is common to them – and in the final analysis to us as well – may continue to be just that. All well-intentioned people are grateful for that.

[18] Law No. 11,284, March 2, 2006, at: www.planalto.gov.br/ccivil_03/_Ato2004-2006/2006/Lei/L11284.htm

The forestry communities of Mexico

Leticia Merino[1]

Collective property rights and forest lands are characteristic conditions in the Mexican countryside. Nearly 75 percent of the country's forest lands are collectively owned, in the form of *ejidos* or *comunidades agrarias*[2], and more than 50 percent of the collective lands are forest. The agricultural lands of the *ejidos* and *comunidades agrarias* are divided into parcels for private usufruct. The forest areas and a large part of the pastureland have been maintained, in practice, as areas for common use, i.e. as non-parceled areas, over which the *ejidatarios/comuneros* as a whole have rights; access to and use of those areas are often regulated by the community assemblies (*asambleas comunales*).

The emergence of the global environmental crisis and the growing social value of environmental goods and services suggest new frameworks for evaluating and critiquing collective property rights in Mexico. The degradation of the country's ecosystems and natural resources has often been associated with the collective nature of rural property. As happened in the past, with various projects for "modernizing" the countryside, these critiques of collective property rights are highly charged ideologically, and have an insufficient empirical grounding. Even so, in view of the problems of generalized poverty and environmental degradation in many regions of the country, one must ask about the viability of collective property for bringing about conservation and sustainable development. As has been mentioned, forest management is of special relevance for this evaluation.

From the perspective of the theory of institutional analysis, a theoretical distinction of great heuristic value in analyzing natural resources management is the distinction between the *type of resources* and the *type of property rights over them*. The type of resources addresses two major conditions: the possibility/difficulty of excluding potential users from access to a given good, and the rivalry entailed in its use, i.e. the level at which the use of one user affects the possibilities of use by other users. The pressures to which the resources are subjected, and the demands posed by their sustained use and conservation, largely stem from the conditions of exclusion and rivalry. Based on the conditions of exclusion and rivalry, classic economic theory distinguishes four major types of goods: public goods, private goods, fee-based goods, and common resources. Natural common resources share with public resources the difficulty of exclusion, though they present a high level of rivalry that is not present in the use of public resources.[3] The conservation of common resources and public resources faces problems of supply; the conservation of common resources also poses problems of appropriation whose solution requires the development of local institutions (rules) implemented through collective agreements.

The types of ownership reflect the nature (public, private, or collective) of those who hold property rights, defined as: right of access, use, decision, conveyance, and alienation. Accordingly, the different types of goods (public, private, fee-based, or common) may be

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1 The author is an anthropologist and social psychologist. At present she is a professor-researcher with the Instituto de Investigaciones Sociales at the Universidad Nacional Autónoma de México.

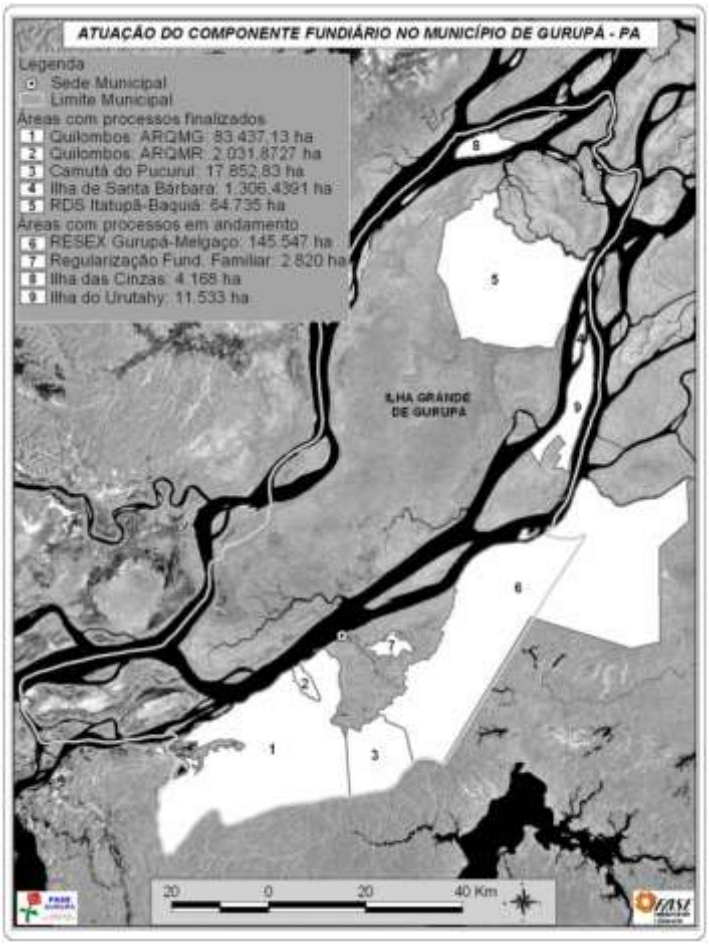
2 Throughout this text I use the term "community" to refer to both *ejidos* and *comunidades agrarias*, and the term "*comunidad agraria*" or "agrarian community" to refer to that type of land tenure.

3 Classic examples of public goods are security, peace, and street lighting.

subject to different forms of ownership. Based on this schema, one can ask about the governance arrangements suitable for the sustained use and conservation of natural resources without reducing the response to an ideological decision to go for one or another type of ownership. The schema makes it possible, however, to question the arrangements in terms of ownership and rights that will give rise to the conditions that allow the relevant social actors to respond to the pressures on a specific resource and resolve the dilemmas of collective action particular to each case.

Nearly 80 percent of the forest area of Mexico is the property of *ejidos* and *comunidades agrarias*. In addition, as indicated, the forests are defined by law and often by the communities themselves as "common resources,"[4] which in the context of agrarian Mexico means lands of common access and use, regulated by the assemblies of the communities or *ejidos*.

From the perspective of the theory of institutional analysis, the forests are common resources whose conservation faces ever greater pressures. At present, these pressures stem not only from population density (declining in many of Mexico's forest areas) but from the impacts of the process of global climate change and the presence of illicit activities such as illegal logging and illegal crops. Forest conservation requires restrictions on use and investments in protection, surveillance, and sanctions, in addition to having economic and technical requirements. These activities call for coordination and cooperation. They require strong participation and the hammering out of local agreements and coordination between actors and processes that are interlinked locally, nationally, regionally, and globally. It would be difficult for the state or private owners in isolation to have the resources and conditions for fully addressing these requirements. The participation of the local communities and the incentives that lead to the possession of (collective) property rights over the forests, by way of contrast, potentially offer major advantages for confronting such pressures and requirements. Nonetheless, not all the communities have these capacities; where trust is scarce and the inequalities and conflicts are insurmountable it is difficult for the communities to take on projects that demand close



[4] The regulation of the Agrarian Law prohibits the parceling of forest areas, although in practice it is common for such areas to be parceled.

cooperation. In these conditions, collective ownership is effectively associated with conditions of "open access" and the destruction of resources.

The loss of forest in Mexico has been a constant process going back decades. In different assessments, and for the vast majority of public opinion, collective land tenure is associated indiscriminately with illegal logging and subsistence agriculture. It is deemed responsible for the loss of our forest wealth. Nonetheless, its degradation results from a complex process in which various types of factors and different scales come together that finally result in the lack of incentives for the local actors to opt to conserve the forest cover. Public policies have been determinant in the evolution of these conditions. During a large part of the 20th century, despite the distribution of agrarian lands, the State constantly limited or eliminated the rights of *ejidos* and communities to the forests by establishing restrictions and concessions for third persons on more than half of the country's forest lands. In the forest areas then considered marginal (mesophyllic forests and jungles) the State actively promoted the change in forest use by subsidizing crop farming, coffee farming, and stock-raising. During the 1970s, 1980s, and 1990s, deforestation rates ranged from 4 percent to 6 percent annually. To date, different government programs subsidize stock-raising at the expense of the forest areas. Pasturing is the most common use of these areas.

During the 1980s, and particularly as of 1994, forestry policy has gradually incorporated the issues of community control and management of the forests, ending the policy of concessions and giving impetus to community forest management and production, as well as social organization around forest management. Though this has been a relatively marginal policy, different communities have taken advantage of the opportunities created, furthering experiences in forestry production and forest management and conservation. These experiences have taken place in indigenous and mestizo regions, in areas of temperate forest and jungle areas. In every case they have been based on the institutions and organizations that have created collective ownership of the land.

At present, more than 50 percent of the country's forest production comes from community enterprises. In the south, Zapotec, Chinantec, and Maya communities; Purépechas and mestizo *ejidos* in the central region; and the Tepehuanos and mestizos in northern Mexico generate employment and income in some of the areas beset by the most marginal conditions in Mexico. The conditions of greatest conservation and stability of the forest frontier are associated with these experiences, whose efficiency is similar to or greater than that of many of the country's Protected Natural Areas.

Centralized state management of the forests has been far from ideal. Forest management under concessions, while having maintained the forest cover in many cases, modified the composition of the tree species of commercial value, for example conifers. Illegal logging proliferated in the regions subject to restrictions, and the national system of Protected Natural Areas, proposed as a *sine qua non* for conservation, has never undergone a systematic evaluation.

The history of forest policy in Mexico and of the community forestry experience of the last 20 years shows that with adequate incentives, collective management is suitable for the conservation of forest resources. The forest communities have proven their potential for serving as a safeguard to conserve environmental goods of global importance. Nonetheless, the transaction costs and dilemmas of collective action pose real challenges that require the understanding and support of the State and society as a whole.

When markets do work for people

Sunita Narain

HEINRICH BÖLL STIFTUNG NORTH AMERICA

Some innovations change lives. A favourite of mine is the village milk collection system, a cooperative model. There's a dairy in the village, people bring in milk, the dairy in-charge places a sample on an instrument, checks the fat content, prints a receipt that tells the seller the fat content and the price. Once a week, the milk-seller encashes receipts. As most villages do not have electricity, instruments and computers work on diesel generators. Every day the co-operative's van arrives to take the milk for sale in the nearby town.

In villages I visited in arid Rajasthan, in north-west India. I saw this system at work. In the evening young girls, women and men streamed into the dairy. They don't have to bring their product individually to the next marketplace. Their milk was checked, they collected their receipt. I asked them if they could read the numbers, written in English. They did not know the language, but could read their receipts. Just consider the economics: one buffalo gives roughly 5 litres of milk each day. People earn, depending on the fat content, Rupees 15 to Rupees 25 per litre. Even the poorest-one-buffalo owners-earn. The money reaches them directly, in their village. Consider also that this village, Laporiya, has seen a back-breaking drought for the past nine years. Meteorological data shows the last good monsoon was in 1997; it rained 700 mm. Since then rainfall has varied from 300-400 mm, it comes in a few cloudbursts. It is in this situation animals become the mainstay of the economy. Animal care is much less risk-averse than agriculture. The dairy is the vital link in adversity-it links people to the market. It helps them cope with scarcity.

Market and retail proponents must understand this system is simple but not simplistic. It provides for the poorest and most marginalised, by investing in improving the productivity of common grazing lands. A critical move, for livestock need fodder, usually desperately short during -peak droughts. Lesser the fodder, lesser the milk. This is investment in hard-core infrastructure, critical for markets to function.

But today, across India, fodder is desperately short. Where there is land but no water for irrigation, farmers cannot cultivate crops, and so cannot use the bonus of residues for animals. The common lands-village grazing lands and forest lands-are over-exploited and under-productive. In most regions, villagers have told me they spend Rupees 12,000 to Rupees 20,000 per year of their meagre earnings, on an average, to buy fodder. But this economy is underground. There is no fodder policy in India, no intervention to protect the grazing lands or improve the productivity of forestland for food for our livestock. Livestock is not wasted or inefficient. But its food is nobody's priority. This is the 'other' food crisis. The pastures-reserved for animal grazing-have shrunk over the years; forestlands are the only remaining commons. Foresters say animals are biotic pressures; they suppress regeneration of forests. They want domestic livestock out of these lands. Their concerns may be valid. But it is equally important to note that domestic animals will need forests, as much as wildlife. We need an explicit policy for this food crisis. We need protection for our linked common pool resource systems. We need to find answers. Villagers in India do so.

For instance, the dairy in Laporiya works even in severe drought because it is connected to the common grazing land. In this village and its vicinity, the NGO Gram Vikas Navyuvak Mandal has spent huge energies to vacate encroachments from common grazing lands. These lands are

administratively under the gram panchayat[1], but over the years most have been taken over-not by the poor but by the powerful. It is a tense battle within the village to reclaim the commons. Laws to protect such lands are weak, the administration helpless. But without the supportive common pasture, there can be little private gain, particularly for the poor.

Reclaiming the commons is the first step towards regenerating these lands. In these villages a fascinating technique has been evolved, called the 'chauka' system, to trap the little rainfall they get and improve the grasslands. The villagers dig rectangular trenches-less than 1 feet deep-to temporarily hold rainwater before it flows into the next trench and then the next and so into the tank. With this system in place, the village common land has become a grand water collection area.

The aim is to make the entire village a rain collection system, to recharge the aquifer, withstand drought. In neighbouring Sihalsagar village, every bit of land has been re-crafted for water-villagers have dug three big nadis (ponds), 25 small ponds and made chauka in their grazing land. Every field has a bund; every drop of rain is trapped and harvested. As a result, the village has water even as its neighbours do not. Since work began on water conservation, the village has never seen bountiful rain. But it still has some water.

In other words, even meagre rain, if harvested, can provide sustenance. The issue then is to increase the productivity of each raindrop. If that scarce water is used for crops, it will benefit some and not all. It will also deplete the groundwater table, for farmers will dig deeper to get water for their fields. The economy will not be sustainable. On the other hand, if that water is used to turn it into milk, it will add value to that scarce resource. If that milk is processed locally, so that more value is added, it will make the economy prosper. The market will work, but only if this politics of scarcity is understood.
In the dingy dairy of Laporiya I learnt: last year, after nine years of persistent drought, when it rained less than 300 mm, the village of 300 households sold milk worth Rupees 17.5 lakh, that is 175000 Rupees. It was a valuable lesson. I will not forget it easily.

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http://www.downtoearth.org.in/editor.asp?foldername=20070615&filename=Editor&sec_id=2&sid=1

[1] Gram Panchayat are local government bodies at the village level in India. Their are about 265,000. The Gram Panchayat is the foundation of the Panchayat System and can be set up in villages with a population of more than five hundred. There is a common Gram Panchayat (Group-Gram Panchayat) for two or more villages if the population of these villages is less than five hundred. 'Panchayat' literally means assembly (*yat*) of five (*panch*) wise and respected elders chosen and accepted by the villagecommunity. Traditionally, these assemblies settled disputes between individuals and villages. Modern Indian government has decentralised several administrative functions to the village level, empowering elected gram panchayats.

Fishing in the Commons

Michael Earle[1]

HEINRICH BÖLL STIFTUNG NORTH AMERICA

Who has the right to fish? That is the essential question when discussing fishing in the commons. Linked to that is a second, hidden question - who *decides* who has the right to fish?

Until relatively recently, fishermen could go more or less wherever they wished, except for a narrow coastal zone. Anything beyond the coastal zone did not "belong" to anybody and so what was there was open access to everybody, including fish, whales and other resources. That famous "freedom of the seas" may have made for good stories about pirates but it was not very good for conservation, as exemplified so eloquently by the tragic history of whaling.

Over the past half century or so that freedom of the seas has been increasingly curtailed as States became more assertive about extending their jurisdiction at sea. The idea of extended jurisdiction was first declared by US (Truman Proclamation of 1945) and various Latin American countries (mostly Chile, Peru and Ecuador) in the late 1940s and early 1950s. Also crucial to that story were a series of so-called "cod wars" fought between Iceland and the UK. In 1958, Iceland declared that its jurisdiction was extended from a breadth of 4 nautical miles to 12 miles. The UK initially refused to recognize this extension but, after several armed confrontations and vessel rammings, an agreement was reached. Similar disputes erupted each time Iceland unilaterally extended its jurisdiction - in 1972 to 50 nautical miles and in 1975 to 200 miles. The fundamental disagreement was whether Iceland had the right to keep British cod fishermen out of these waters; the situation was so serious that NATO got involved when Iceland threatened to close an important naval base.

In the end, the international community agreed with Iceland and by the late 1970s, most States had declared Exclusive Economic Zones (EEZs) out to 200 nautical miles from the coast. This was formally codified by the UN Convention on the Law of the Sea (UNCLoS) which was adopted, after a long negotiation, in 1982 and entered into force in 1994.

Under the UNCLoS, the closer to shore, the greater the right of the coastal State to restrict the activities of other States. Out to 12 nautical miles lies the territorial sea, over which the coastal State has sovereignty, including for fisheries management. It can prevent vessels from any other country doing anything at all other than "innocent passage", i.e. simply steaming across. Beyond the territorial sea, the coastal State also has the right to exclude other vessels and manage fisheries in its EEZ (out to 200 nautical miles). UNCLoS imposes certain responsibilities as well. For instance, it must prevent over-exploitation of fish stocks and requires States to cooperate with their neighbours if the same fish stock is found in both EEZs.

Part of the justification for the extension of this jurisdiction was for States to gain control over resources in "their" waters, claiming that they would do a better job of conserving fish stocks than the freedom of the seas doctrine had done. Since 90% of the world's fish stocks lie within 200 miles of the coast, the vast majority of the world's fish stocks were suddenly no longer available to all, but rather under the legal jurisdiction of individual States. There were a few important exceptions such as tuna and whales, which often occur on the high seas.

The next step was for States to decide who was able to fish in their waters and with what other

[1] The author is Fisheries Advisor to the Green Group in the European Parliament in Brussels.

restrictions. The general pattern was to begin by awarding the individual right to fish by licensing fishermen or fishing vessels. When that proved insufficient to prevent over-exploitation and depletion of stocks, further restrictions were imposed on how much fish could be caught, what gear could be used, etc.

Many States have been unable to manage fisheries any better than an open-access regime to the high seas has done. As a matter of fact, at a global level, less than a quarter of the world's fish stocks are being fished at the limits of what can be considered sustainable and many of them have collapsed. While some countries do a better job than others, overall the picture is bleak and the wholesale nationalization of fisheries has not conserved fish stocks.

That brings us back, again, to the high seas, the vast area of the oceans that are beyond the jurisdiction of any State. Even there, though, freedom of action is not total. Vessels on the high seas are subject to the authority of the State whose flag they fly, so that it is Canada which decides what can, or cannot, be done by Canadian vessels. Many countries do not fulfil their obligations as flag States, the most notorious examples being the so-called flags of convenience, many of them in Latin America (e.g. Panama, Belize, Honduras).

Before UNCLoS was developed, there were examples of States forming international organizations to manage fisheries, the earliest one being in 1923 for halibut in the North Pacific, then a few after the Second World War to manage exploitation of whales and tunas primarily. Since the Law of the Sea requires States to cooperate when fishing on the high seas, several other organizations were established during the 1980s. Their number continues to grow[2]. Known as Regional Fisheries Management Organizations, they adopt rules to limit fishing in various ways, primarily by means of quotas and restrictions on fishing gears that are allowed, but occasionally by limiting the number of vessels that can fish. States are thus trying to impose the same sort of rules internationally that they have applied to their own waters, presumably in a attempt to prevent overfishing. However, they only apply to vessels from countries that have joined the organization, so that vessels from other countries essentially still enjoy the freedom of the high seas. This poses an enormous problem for conservation of fish stocks but the steps being taken to resolve that are beyond the scope of this note.

At both the national and international level, with some exceptions, simply imposing limits on the number of fishermen who can fish, often combined with restrictions on the amount of fish they can catch, have conserved neither fish stocks nor the livelihoods of fishermen in the coastal communities who exploit them. So, another approach was sought, which turned out to be the privatization of fish stocks.

Beginning in the 1980s in New Zealand, several governments began the practice of allocating rights to specific quotas of fish in New Zealand waters to individuals or companies. Usually, these individual quotas are expressed in terms of a fixed percentage of the total quota, so the amount of fish involved can increase or decrease depending on the size of the overall quota. Sometimes these rights are tradeable, or sellable, so that individuals can amass rights over significant portions of the overall quota. Such developments, whereby national management authorities promote the privatization of access to what are perceived to be publicly-owned resources, has met much opposition in the fishing communities, except from those who benefit

[2] Ones of particular interest to Latin America are the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tunas, the Permanent Commission for the South Pacific and OLDEPESCA, the Latin American Organization for Fisheries Development. See overviews at *http://www.fao.org/fi/website/FISearch.do?dom=rfb*

from it! But this debate is beyond the scope of this short note.[3]

There is a similar move in regional organizations as well. In instances where quotas are established for certain species such as tuna, parts of that quota may be allocated to individual States. Allocation is usually based on historical catches[4], the track record in the fishery, not necessarily on any notion of sustainability. Countries which have fished more are thus allowed to continue fishing more. Apart from the fact that this tends to reward countries that have contributed to overfishing, it is also prejudicial to States that want to enter the fishery for the first time, as, in theory, they have the same right as others to fish in the global commons. Many of these aspiring entrants are developing countries, and trying to accommodate their wishes to develop their fishery has caused considerable friction in some cases.

To answer the question posed above, States have given themselves the right to decide who can fish by creating their EEZ and reserving it essentially for their own fishermen or charging fishermen from other countries for the privilege of fishing there. In some cases, they have then given, or sold, that right to individuals or to large companies.

The reasons for failure of each of these approaches are multiple but a major factor is the global aspect of modern fisheries. The commons – i.e. the ocean and the fish stocks available all over the world – is global. But everybody wants access to it: local fishermen as well as national fishery industries and transnational corporations. More fish enters international trade than any other food commodity. The capital behind the fishing companies is global. The major means of production are global, since fishing vessels regularly move from one ocean to another within a matter of months. At the end of the day and despite of all attempts for regulation, fish stocks continue to be over-exploited.

Even if it seems impossible to agree and implement a programme for the management of global fisheries, the principles of this management remain obvious: If we want to continue fishing in the global commons, fisheries management must be done on a cooperative and global basis, partiendo del principio de sustentabilidad para conservar el recurso como tal.

[3] Interested readers should explore the literature on what is often called "rights-based management" and "individual transferable quotas" (ITQ)

[4] Cabe destacar que en el Sistema de Comercio Europeo de Emisiones, los derechos (certificados) de emisión fueron adjudicados gratuitamente sobre la base de las “emisiones históricas generadas” a los grandes contaminadores. Véase también: HAAS, Jörg; BARNES, Peter: La atmósfera como bien común Acerca del futuro del comercio europeo de emisiones en este mismo libro.

Brave New World War[1]

Jamie Metzl[2]

HEINRICH BÖLL STIFTUNG NORTH AMERICA

Whether it arrives a decade from now or more, the day will come when the human race, or at least a subset of us, will have the ability to take control of key aspects of our own evolution. But while national and global debates on such issues as in-vitro fertilization (IVF), stem cell research[3], and genetically modified organisms (GMOs) have begun to open people's mind to the challenges and opportunities of revolutionary advances in the life sciences, the world remain dangerously unprepared for the international genetic "arms race" that could one day emerge. To maximize the benefits of these new capabilities while minimizing the potential harms, and to keep popular fears of this enormous transformation from overcoming its potential contribution to the quality and security of human life, the world community must develop new standards for human genetic manipulation and an enforcement structure capable of preventing the most dangerous abuses.

The convergence of complementary and mutually reinforcing advances across the fields of nanoscience, biotechnology, information technology, human fertility, gene therapy, molecular biology, and cognitive science makes the arrival of more revolutionary capabilities in human reproductive, or "germline", engineering inevitable. Our species will in the near future become equipped with the Promethean ability to manage our own evolutionary process to an extent and at speeds that Charles Darwin never could have imagined. As opposed to the somatic gene therapies[4] already in use today which target non-reproductive cells, germline technology alters reproductive cells at the outset of the fertilization process, allowing genetic changes to be replicated in every ensuing cell.

Although germline engineering is not being carried out on humans today, the process is already being used widely in experiments with laboratory animals such as mice. Scientists disagree over the timeframe, but most generally accept that this technology will soon reach a stage of development where it could be used on humans. Already today, the pre-implantation Genetic diagnosis (PGD) process enables parents to choose the healthiest of their fertilized eggs, or select a gender, prior to re-implantation in the In Vitro Fertilization (IVF) process. In the future, a relatively simple additional step will allow an artificial chromosome with a targeted genetic manipulation to be inserted into such a fertilized egg. As these capabilities advance, they will hold the key to potentially massive enhancements to human life and well-being.

Just as advances in agriculture, sanitation, and health care have enhanced the length and quality of our lives (and transformed whatever an alternate evolutionary process might have been), so too will advances in bioengineering help secure and enhance our future – extending our lives, making us immune to diseases, massively expanding our memory capabilities, and expanding

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1 Reference to Aldous Huxley`s „Brave New World", 1932; which is the archetypal and still instructive 20th century biopolitical scenario.

2 The author is an expert on Southeast Asian history and politics, Executive Vice President of Asia Society, United States.

3 Stem cells are cells capable of developing into a variety of specialized cells and tissues. Stem cells may have therapeuthic value, but could also be used for non-medical „enhancement" procedure.

4 Somatic Gene therapy is provided by introducing a new therapeutic gene (transgene) into the diseased cells of a patient. The modified cells express the introduced gene and their new phenotype provides some advantage to the patient.

our sense perceptions, to only name a few possibilities.

But as these scientific capabilities spread quickly around the world, legitimate and imagined fears will emerge of an unlimited phantasmagoria of real and perceived dangers including the loss of genetic diversity, the creation of Frankenpeople, and the unknown outcomes of meddling with a system as infinitely complex as the human being.

Although spectacular debates have emerged within societies and in international fora on many issues related to the human genetic manipulation process, and although some states will certainly mandate tough restrictions on these capabilities, it will be extremely difficult to stop motivated states or groups of individuals from engaging in human genetic manipulations that go beyond any commonly accepted norms. On the contrary, some will have an increasing incentive to move forward aggressively.

In today's increasingly globalized economy, individuals, corporations, and states tirelessly seek even the smallest advantages over competitors that can then be leveraged into industry-transforming gains. It is extremely difficult to believe that these types of competitive pressures will not also become drivers of the human genetic manipulation process. On the contrary, it is far more likely that humans, or at least some groups of us, will seek to provide our children with the competitive advantages that would come with exceptional capabilities.

As the embrace of these capabilities grows, new fissures will emerge both within societies and between them.

Within societies, social Darwinists have long claimed that the elites were smarter and had a greater natural capacity than the masses, a concept that has clearly been proven wrong as opportunity has democratized. But, what if in addition to having better nutrition, more exposure to ideas, and better schooling, the rich and privileged within a society also had genetic manipulations that actually made their brains function better? Would it begin to make sense for these enhanced people to assume leading roles in running institutions and governments and making decisions on behalf of the less enhanced populace? Uneven genetic enhancement could place enormous strains on the democratic process.

Between societies, two types of strains might emerge. First, enormous conflict would likely ensue between the states that ban or restrict new forms of human genetic manipulation and those that do not. If the current debate over genetically modified crops is anything to go by – where many Europeans see an existential threat to their way of life and Americans and Asians are generally far less concerned – the stress on international systems over genetically modified people would be monumental.

But if one country with different norms for example, were to move forward with an aggressive genetic enhancement program while other countries ban or limit these activities, competitive pressures would force the other countries to choose between accepting a deteriorating relative position in the world, working to halt the genetic enhancement activities going on in the outlyer country, beginning such genetic enhancement activities themselves in order to keep up, or seeking international consensus on what an acceptable governance framework might look like.

Second, the existing divide between rich and poor countries would become even greater. If access to adequate food, health care, governance, and education make it seem like those living in developed and underdeveloped countries live in different worlds, uneven access to the coming capabilities for human genetic manipulation will make it seem that rich and poor countries inhabit different universes.

The challenge for the world, therefore, will be to maximize the benefits of the inevitable scientific progress, while seeking to develop globally accepted norms and standards for human genetic research and its applications that can prevent the worst abuses and establish an international framework for addressing and mitigating the conflicts that will emerge.

Some efforts, although insufficient, have already been made, including the 1997, UNESCO *Declaration on the Human Genome and Human Rights*, which prohibits "practices which are contrary to human dignity, such as reproductive cloning of human beings." In 1998 the Council of Europe agreed to the *Convention on Human Rights and Dignity with Regard to Biomedicine*, which asserted that interventions aimed at modifying the human genome can only be undertaken "for preventive, diagnostic or therapeutic purposes and only if its aim is not to introduce any modification in the genome of any descendents."

The February 2002, the United Nations Ad Hoc Committee for an International Convention Banning Human Reproductive Cloning began negotiations intended to lead to a binding treaty. The non-binding General Assembly resolution *United Nations Declaration on Human Cloning*, adopted in March 2005 by a vote of 84 in favor, 34 against and 37 absentions, called on member to "prohibit all forms of human cloning inasmuch as they are incompatible with human dignity and the protection of human life."

The weakness of all of these documents and the standards they seek to set is obvious based on the lack of both consensus and enforcement power. As in the UN resolution, the countries with the most to gain from and the greatest hopes for this scientific advancement are and will remain extremely reluctant to have their activities limited by others. Even if a consensus were to emerge, enforcement power is, with the partial exception of Europe, focused on the national level, while the knowledge and capabilities for engaging in this activity is increasingly mobile and able to find a home wherever standards are more lax. These documents also say very little about establishing standards for how even research that fits in principle into accepted norms should be carried out.

Some genetic manipulation, for example, might be considered acceptable if chromosomes are inscribed with genetic instructions making it impossible for introduced mutations to be transferred to future generations, or if artificial chromosomes contain chemical "switches" that can be used to activate or de-activate specific genes. Although the expertise currently exists to make a germline genetic mutation non-inheritable, the world community would still have to figure out a way of ensuring that any human genetic manipulations are carried out in a matter which does this. The issue in this case is not whether a mutation is introduced, but how it is introduced.

Any international regime would therefore have the tough dual role of being both an enabler of responsible, sound technological advancement and an enforcer of limitations as to how far these activities can go.

There are few successful models in the international legal system for doing this effectively, but in spite of its flaws and limitations, the Nuclear Non-Proliferation Treaty (NPT) may be the least bad model among them.

The 1970 NPT sought to limit the spread of nuclear weapons by establishing both standards for non-proliferation of the five states permitted to own nuclear weapons (Britain, China, France, USA, and the USSR) as well as a set of incentives designed to encourage non-nuclear armed states to remain so. The non-nuclear signatories of the NPT basically agreed to refrain from

acquiring or developing nuclear weapons in exchange for a promise from the five nuclear-armed states to help the others develop nuclear energy capacities for peaceful purposes.

Although the NPT has come under increasing strain[5] the treaty still boasts an overall impressive track record. Signatory states South Africa and Ukraine voluntarily gave up their nuclear weapons, Libya publicly renounced its secret effort to develop them, and the acquiring of nuclear weapons by non-nuclear states remains a taboo, even if a weakening one.

The potential for a genetic "arms race" and the potential for a nuclear arms race share certain characteristics. Both deal with the implications of cutting edge technologies whose applications become increasingly accessible to wider groups of people and states, both represent capabilities that have enormous potential to improve people's lives matched by a similarly great potential to harm them. And both represent technological capabilities developed in more advanced countries that become desirable the world over.

An NPT-like framework for human genetic engineering would be incredibly difficult to negotiate because it would need to neither offend the sensibilities of powerful constituencies deeply uncomfortable with the concept of human germline engineering nor impede the beneficial development of new generations of knowledge and its application. In addition the standard would need to be extremely permissive, and flexible enough to keep the more scientifically aggressive countries on board. Although this balance would be enormously difficult to develop, finding it will be critical to preventing an unimpeded, unregulated human genetic "arms race".

According to a Human Genetic Modification Abuses Non-Proliferation Treaty, states possessing greater knowledge in the field of genetics would pledge to share basic science capabilities and the broadly-defined benefits of this science with those states that agreed to accepted protocols for human genetic manipulation and to implement appropriate regulations, presumably requiring the non-inheritability of germline genetic manipulations and the banning of human reproductive cloning. At regular intervals, the basic tenets of the treaty, including the list of what is considered to be an abuse of the genetic modification process, will need to be re-negotiated. Those states that allowed violations of the treaty on their territory would be required to immediately stop the violating activity or face sanctions

Two serious objections to this approach demonstrate the imperfections of such a treaty, but do not suggest a better course. The first is that states will need to develop their own standards for genetic modification before they can consider an international regime. Although this argument makes some logical sense, the danger is that the science is moving so quickly that the international community must work to establish an enforceable, if changeable, international standard or risk creating a global culture more conducive to the worst abuses.

The second is that this type of regulation, particularly if armed with enforcement mechanisms, will be used by opponents of legitimate research to advance principles antithetical to the genetic engineering process as a whole, including its many benefits. This is a real danger, although the supporters of the treaty will always be able to invoke the counter-pressure of needing to maintain a progressive and permissive framework in order to keep the most advanced countries on board.

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[5] Technology required to develop nuclear arms has become far more easily transferable, non-signatory states - North Korea, Pakistan- have transferred requisite knowledge and equipment, exceptions to the norms have been carved out for India, a non-signatory state.

Although the prospect of human genetic modification is terrifying to many, it is a reality, and a potentially beneficial reality, of our future. As difficult as it will be to establish an international framework for maximizing the benefits and minimizing the dangers of this revolutionary advance, the alternative of allowing these capabilities to emerge unregulated and unchecked will prove much tougher and less desirable in the long run. The science is moving extremely fast. The policy framework must now begin to catch up.

Trusted Computing

Lisa Thalheim[1]

The widespread use of the term "intellectual property" in the discussion on access to knowledge and information is a fortuitous circumstance for those who profit from the sale of nonphysical goods. The term suggests that texts, music, and know-how are exactly the same as cars, houses, or televisions. There are clear rules for defining ownership of material goods, the rights of the owner, and what we understand as theft of such a good.

The mantra of intellectual property cannot, however, belie that there are important differences between a digital piece of music and a vehicle. One such difference is that the musical piece – in contrast to the vehicle – can be shared simultaneously among any number of users without anyone incurring a damage. Another difference is that a vehicle cannot be copied any number of times and the copies distributed – which is possible in the case of a digitally available piece of music. We have already witnessed how those wishing to sell music respond to the possibility of reproducing musical pieces at virtually no cost. One need only look, for example, at the criminalization and vigorous prosecution of file-sharing network users by the music industry. The term "pirated copy" itself serves as an example of how public perception is influenced. It relates the unauthorized reproduction of music and text to the criminal offense of robbery, which, by definition, is linked to the use of force. There are also efforts at the technological level to quash unlimited reproduction by preventing the copying of musical pieces using software and hardware. This method has the advantage that the interested parties – mostly international corporations – do not have to rely on policy makers and the legal system.

Trusted computing is a technology that attempts to broadly implement this kind of artificial restriction on the possibilities of digital products, even though its creators vigorously dispute having had this intent in its development.

Trusted computing in itself is difficult to grasp. Not only is it complicated from a technological point of view but it also combines various features, some of which are desirable and useful, others of which are problematic and dangerous – depending on who is deploying the technology and for what purpose. Advocates praise trusted computing as a solution for protecting against computer viruses and other attacks. Opponents vocally and energetically criticize the damage potential – because industry associations, manufacturers, and possibly also governments are usurping the user's control over his own computer. What is it about this technology that causes such a stir? And who is right – the advocates or the opponents of trusted computing?

In 1998, some of the major computer industry corporations founded the Trusted Computing Platform Alliance (TCPA). This industry alliance was then renamed Trusted Computing Group (TCG) in 2004. The founding members were chipmakers AMD, Infineon, and Intel; hardware makers AMD, Hewlett-Packard, IBM, and Sun Microsystems; and software maker Microsoft. The Trusted Computing Group's website meanwhile lists over 140 member companies.

Trusted computing can be viewed as an approach to solving problems that we have with our globally linked and ubiquitous computer systems: computer viruses, attacks on servers and private PCs, and, consequently, the loss of confidential information.

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[1] The author is a student of computer science and philosophy at Humboldt University in Berlin and a freelance consultant for computer security.

Some of the founding companies developed their own projects. Microsoft initially called its project Palladium and then NGSCB, which stands for *Next Generation Secure Computing Base*. This project covers both hardware and software. NGSCB attempts to develop fully trusted computer systems, including software and hardware. It thus differs from Intel's *Safer Computing Initiative*, which is mainly concentrated on the hardware aspects of trusted computing.

Simultaneous to this effort, the TCG members are developing TCPA specifications: a series of documents detailing how trusted computer systems are to be implemented.

With these specifications, the TCG has proposed a de facto standard for how the basic security problems of computer systems are to be solved in the future.

The centerpiece of the TCPA is the Trusted Platform Module (TPM), a small chip that is cheap to build and is supplied as an integral component of computers, printers, network hardware, and entertainment electronics. That means that anyone who purchases hardware is simultaneously buying the TPM – whether consciously or unconsciously. Most current notebooks already contain such a TPM. Both the U.S. Army and the U.S. Department of Defense require that every newly purchased computer contain a TPM.[2]

The function of a TPM can be compared to that of a notary public. The TPM can store data confidentially and only distribute it under certain, predetermined conditions and it can certify information about the status of the computer system.

It can reliably determine whether the computer has uploaded a predetermined set of programs, whether the licensing provisions are being observed for those programs, or whether they have been manipulated – whether by a virus or knowingly by the user. The TPM can then present this information to the computer user.

However, it also offers the possibility of providing this information to third parties – say, the operator of a website or an online music provider with whom the user interacts.

The latter feature is one of the main criticisms of opponents of trusted computing because this function enables online content providers to determine, for example, whether a user is working with a "trusted" software environment. From the provider's perspective that would be a software environment, say, that makes it impossible to copy legally acquired content – a document, a piece of music, a video – onto a computer or to burn it onto a CD. So it is conceivable that providers might view only Microsoft Windows with Microsoft's MediaPlayer as trusted and simply deny its services to anyone who does not use such a software environment. While the user would be free to deactivate the TPM – this fact could, in turn, be determined by the provider and serve as a reason to exclude the user from the service in question.

The other criticism of the TCPA specification is that the user is granted only limited control over his computer. The TPM works on the basis of a secret key that is cryptographically different for each TPM. Practically all TPM functions are built on this key and, as no two TPMs in the world have the same key, it, in turn, makes possible to identify a TPM. Users, however, are unable to gain knowledge of or change this key; the manufacturer burns the key onto the TPM during production. The TCG justifies this decision with the argument that it

[2] http://iase.disa.mil/policy-guidance/dod-dar-tpm-decree07-03-07.pdf and http://www.army.mil/ciog6/news/500Day2006Update.pdf

serves to protect the user himself. If the user does not know the key, he cannot erroneously reveal it to an attacker.

A TPM, in principle, offers some useful functions that can help users better prevent important data from being lost or compromised. Yet it still seems too early to be able to estimate the mid-term effects of implementation of trusted computing. The technology is very complex and so far has not been discussed in the public. It will also take some time before applications begin using TPMs on a broad basis. What these applications will look like and what they will actually perform still remains widely unclear.

What is clear, however, is that trusted computing by no means offers the promoted patent solution to all the problems of computer security. Instead, the cited risks associated with the deployment of trusted computing are already becoming evident.

A technological assessment of the TCPA specification leads to the conclusion that the technology is unlikely to have a dramatic impact on the PC software market. It is likewise difficult to predict whether trusted computing will have significant negative effects on free software. But the existence and widespread use of TPMs in all computers weakens the hand of the individual (the user) vis-à-vis the computer and media industry. The technology has considerable potential to shift the power relationship further in favor of major corporations and industrial alliances.

Even if trusted computing does have less influence in the PC sphere, we will tentatively see a greater influence in the area of specialized devices, especially entertainment electronics. Here, it is already now practical to allow the user only minimal control over the device. That has recently been shown in devices such as the Apple iPod, iPhone, and Amazon's Kindle. The TCPA specification is ideal for bringing to market reliable and near unavoidable digital rights management[3] (DRM) applications on devices. Trusted computing is no longer a technical framework that can be used in a variety of ways. Rather, the companies behind trusted computing are primarily representing their economic interests by advancing this technology. These interests coincide in part with those of the user; in part, they are also intended to restrict the freedom and rights of the user (and hardware owner) as much as possible.

Last but not least, the TCPA can also be understood as an attempt to technologically ingrain social acceptance of the concept of "intellectual property" without concern for the outcome of current, political, social, and legal discussions.

It is up to users to reject the loss of control associated with the TCPA and to demand a technological alternative that treats users not as opponents or defenseless victims but as partners and citizens.

[3] Digital Rights Management is a catch-all phrase for technological measures undertaken to guarantee the enforcement of rights to digital content, such as copyrights to documents or music. A frequent application of DRM technologies is, for example, protection against the copying of document or music files.

For the liberation of cyberspace, we need you to join us

HEINRICH BÖLL STIFTUNG NORTH AMERICA

Interview with Richard Stallman (RMS) by Silke Helfrich (S.H.)

Richard Stallman was the first to develop free licenses for software and other content. As the founder of the Free Software Movement he talks about the achievements of the movement as well as the challenges ahead. Free Software is a new commons built from the bottom up.

S.H.: Richard, You have been a key player in the GPLv3 process...

RMS: ...well, that is such an understatement that it is almost misleading. I wrote version 3 of the GNU General Public License (GNU GPL), with help from lawyers, just as I wrote version 2 and version 1. I take responsibility for all the decisions, whether they turn out to have been good or bad.

S.H.: The GPLv3 license is now out, and free software projects are beginning their migration to it, so it seems to me, that practice will prove how details turn out. But, what's new in GPLv3, in layman's terms? Is there anything revolutionary in there, which everyone should be aware of?

RMS: The original GNU GPL was revolutionary: for the first time, a copyright license was designed to defend everyone's freedom to cooperate. It does this by giving everyone the four essential freedoms1, and forbidding the methods by which intermediaries might take them away from you. This practice is known as "copyleft".

Nothing in GPL version 3 is revolutionary, because its goals are the same as those of GPL version 1 in 1989. We made GPL version 2, in 1991, to respond to changes in the circumstances and a new threat to freedom: software patents. The changes in version 3 are larger and more numerous, but each of them is meant to address a change in circumstances or handle some specific aspect better.

S.H.: It is obvious, that as a legal instrument, the license bears technical meaning. But its effect goes beyond its immediate consequences in courtrooms: the licence also bears a message to society as a whole. What is the essence of this message?

RMS: The GPL's message is that freedom is important. You deserve freedom, and you must respect others'freedom.

S.H.: Actually, the free software community have started, over the last couple of decades, to develop worldwide organization, which enable people from all over the world to participate in global debates and activities for more freedom in an independent and constructive way. One of the thesis of the free software community is, that we need to propagate free software for a more just world, yet, it is not the most intuitive one. How does the free software movement's discourse link political freedom and social justice?

RMS: The free software movement takes for granted certain ideas of freedom and justice: namely, that people should control their own lives and should be encouraged and permitted to cooperate. Formulated in negative terms, it means that people should not have power to divide and subjugate others. I don't try to prove this, because I don't know if it is even possible to prove such a basic ethical position, and because the point is to win freedom rather than theorize about what it means.

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[1] Freedom 0: The freedom to run the program for any purpose; Freedom 1: The freedom to study and modify the program; Freedom 2: The freedom to copy the program so you can help your neighbor; Freedom 3: The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.

S.H.: But how does the free software approach concretly enable emancipation and bring us closer to Utopia?

RMS: I have no basis to claim that a perfect world is possible. My campaign is for a world in which we have freedom to cooperate and to control our own computers. To call that "utopia" would imply it is unattainable; but in fact it exists today. We have developed enough free software already that rejecting non-free software is possible at the cost of an occasional inconvenience.

S.H.: Both the free software and the commons discourse are very much centered around individual freedom and around collective rights as a mean towards a free society. This includes freedom from meddling by private or state actors. Freedom, however, always entails responsibility,in particular the individual's responsibility towards the commons, towards knowledge and information as well as towards natural resources. In the case of free software, the common pool ressource is embodied in a large body of code. So, who must take responsibility for what in free software?

RMS.: As software developers and distributors, our ethical responsibility is to respect the freedom of others. When we develop and release software, our responsibility is to release it as free software -- because to release it in any other way is to subjugate its users. When we install and use software, our responsibility is to reject non-free software, because accepting it grants it an air of legitimacy and often pressures others to use it as well. As a community of software users, our responsibility, and that includes you) is to carry out, or to fund, the development and maintenance of the software we want to use. If we don't do it, it won't get done.

S.H.: Let's take a look at a the processes behind free software, both software development and the GPLv3 process. Eben Moglen once said that both these processes are nothing else but the construction of community. Do you agree with that?

RMS: That is a rather vague statement; I'd rather say that both of these activities are part of building a community in which we can live in freedom...

S.H.: ... and what kind of citizens do we need to construct communities in which we can live in freedom?

RMS: We need citizens who consciously appreciate freedom and recognize the folly of sacrificing freedom for convenience.

S.H.: What are currently the largest challenges and dangers for the free software idea and their implementation, both within and outside the community?

RMS: Our biggest practical challenge is to overcome social inertia. Most computer users and most institutions use Windows, and their activities pressure and lead others to use Windows. It is a self-perpetuating problem which consists of people giving in to the pressure of social inertia by adding themselves to it. A similar pressure, known as the "network effect", encourages use of non-free software such as Skype or RealPlayer.
To overcome social inertia, we need to resolve not to give in to it--in other words, to resolve that we will not act in ways that encourage others to use these non-free programs no matter what argument may be offered for doing so. Thus, schools should not teach students to use Windows even if the students ask them to.
At the deeper level, our biggest challenge is to be heard at all. The companies that distribute versions of the GNU/Linux[2] system do not describe it as free software, and they do not call it GNU/Linux. They prefer to describe it as "open source", a term which was promulgated to disconnect free software from our ideas of freedom. And they call the system "Linux"--in fact the name of one important system component--thus giving all the credit to a man who has never been

[2] The GNU Project was launched in 1984 to develop a complete Unix-like operating system which is free software: the GNU system. Variants of the GNU operating system, which use the kernel called Linux, are now widely used; though these systems are often referred to as “Linux”, they are more accurately called GNU/Linux systems. http://www.gnu.org/

an advocate of freedom for computer users. The ideals of freedom and social solidarity are never even mentioned. In effect, our work has been co-opted and disconnected from our values.

When you see an article that describes me as the "father of open source", or that talks the "Linux" operating system, you can help protect our work from co-optation. Talk about free software and freedom; talk about GNU. And above all, when discussion focuses shallowly on short-term practical convenience, bring in deeper values of freedom and social solidarity.

S.H.: Furthermore: we are discussing in this book several strategies of commons enclosure: economical, technological, political and legal ones. Am I mistaken in the impression that GPLv3 is a wonderful example of how resistance to the enclosure of a commons can be enacted within the framework of current legislation?

RMS: Yes, it is a good example -- but it also shows the limits of such strategies. For instance, no software license can protect a free program from a patent holder that seeks to suppress it entirely. The most we can do, and do in the GNU GPL, is make it difficult for a patent holder to extract money from distributors of the program.

S.H.: Many campaigns for freedom have met limited success, if at all, yet the free software movement seems poised to provide a healthy exception to the rule. What makes this movement so successful?

RMS: The free software movement doesn't oppose corporate power in general. Instead it aims at eliminating the practice in which software developers subjugate software users. That's painful for the software megacorporations which use that practice, but good for software users, which include individuals, corporations and even megacorporations. As a result, while the software megacorporations sometimes try to crush us, many others partly support us. That may be part of what has enabled to get this far.

S.H.: And how far have you got?

RMS: In absolute terms, free software is quite successful, with tens of millions of users. ut we also have far to go. Most people still use proprietary, user-subjugating operating systems such as Windows and Mac OS. These systems are designed to restrict and control their users; and in case you find a way around the restrictions, the owners can forcibly install new software to reimpose their control at any time. Every non-free program imposes the developer's power over the developer, and the only way to be free is to stop using it. We have a long way to go to achieve the liberation of cyberspace, and Microsoft has lots of money to buy the support of states, schools,standards committees, computer manufacturers, Original Equipment Manufacturers(OEMs), and whoever can help pressure the general public to remain under Microsoft's control.

We cannot count on blind forces of history to liberate us. "Power concedes nothing without a demand; it never has, and never will." (Frederick Douglass) For the liberation of cyberspace, we need you to join us, by demanding freedom for yourself and others.

The Commons: A New Narrative for Our Times

Silke Helfrich, Jörg Haas[1]

It is a challenging undertaking to introduce new political and cultural perspectives amid the transformation to a knowledge-based society and intensifying multiple crises. Not only must these concepts be theoretically and substantively sound, they must be capable of changing political and social realities. This essay investigates whether the concept of the commons can succeed in becoming ingrained in the political discourse and thinking.

The commons are, as Jonathan Rowe puts it, "the hidden economy, everywhere present but rarely noticed."[2] They are that often invisible third element, beyond the market and government. The discourse on the commons focuses on three interrelated realms -- a set of resources or resource systems, the communities that use them, and the social practices and property regimes for managing the resources.

We start by explaining our understanding of the concept of the commons and its relationship to debates about property rights. We then look at the complex relationship between common pool resources and the communities that use them. This presentation is only a rough sketch of current political and social conflicts, it suggests how the commons profoundly challenges the neoliberal economic worldview.

The Commons at the Center of Major Social Conflicts

Many conflicts of our time revolve around the erosion of common pool resources, on the one hand, and the concentration of rights to use and dispose over those resources, on the other. The erosion of common pool resources and the concentration of control over them affect the individual in his environment in very different ways. As biological diversity and cultural traditions decline, there is a corresponding loss of languages[3] and thus the stores of knowledge about specific ecosystems and benefits of plant and animal species. Forty-nine per cent of the seed market is concentrated in the hands of only four companies,[4] and five companies control 90 per cent of the copyrights in the music industry.[5] Whatever area we look at, we are confronted with growing concentrations of control, money, and power.

Such concentration limits the use rights of everyone and erodes the vitality and diversity of the commons. To be sure, there are counter-movements to uphold centuries-old traditions in the seed exchange between farmers and the "wondrous expansion"[6] of

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[1] Jörg Haas, a scholar of ecology and sustainable development at the Heinrich Boell Foundation until 2008, is currently program coordinator for EU climate diplomacy at the European Climate Foundation. Silke Helfrich,long-time director of the Heinrich Boell Foundation regional offices of Central America, Mexico, and Cuba, is currently working as a freelancer.

[2] Rowe, Jonathan: *The Hidden Commons*, 2001: http://www.yesmagazine.org/article.asp?ID=443

[3] Six thousand living languages currently exist. Between 30 and 90 per cent of them are threatened with extinction by the end of the millennium. (http://de.wikipedia.org/wiki/Bedrohte_Sprache).

[4] ETC Group: The World's Top 10 Seed Companies - 2006. http://www.etcgroup.org/_page24?pub_id=656

[5] Nuss, Sabine: Copyright & Copyriot. Münster 2006.

[6] Cf. Drossou, Olga; Krempl, Stefan; Poltermann, Andreas: *Die wunderbare Wissensvermehrung. Wie Open*

knowledge, culture, and innovative potential made possible by digital technologies.

But critics of privatization and commodification of countless resources – "the enclosure of the commons" – are generally locked into a debate about whether solutions require "more government" or "more market." These demands can no longer be so predictably attributed to particular political camps in a left/center/right spectrum. In the wake of the 2008 financial crisis, among other things, libertarians, for example, do not have a problem with government intervention to stabilize the status quo.

The problem may be that the ideologies of the fading 20th century are losing their explanatory power. They are gradually dying because they are no longer valid. State socialism has failed and the governments of nominal democracies in many parts of the world are often corrupt and unable to address enclosures of the commons. Nor can the neolibertarian economic model, through key trade liberalization projects such as the Free Trade Area of the Americas (FTAA), address these problems.

The logic of "either-or" has also failed in light of contemporary events. For decades, government institutions have actively advanced private economic interests worldwide at the expense of ordinary people. Numerous commons have fallen and are falling victim to this unholy alliance of government and business. For example, resources that for centuries were perceived as "belonging to everyone," were actually only recently turned into commodities through negotiable "intellectual property rights," which now authorize private ownership of human and plant genetic resources, "business methods" and the mathematical algorithms of software code.

Conflicts are intensifying for at least three major reasons:

1) *The finite supplies of natural resources is becoming more evident.* As large parts of the populations of emerging economies such as China and India have transformed themselves to promote mass consumption, it has become painfully clear that what until now have been widely assumed to be virtually "inexhaustible" resources are, in fact, finite. This applies to fossil fuels and minerals ("peak oil") as well as to biotic resources (forests, soils, fish stocks). Soaring material consumption has also dramatically overtaxed lakes and oceans as repositories for greenhouse gases.

Climate change is the culmination of this dramatic trend, which has now been forcefully catapulted onto the global political agenda. Biofuels are another example of how the inability of society to manage finite oil reserves and atmospheric repositories has an immediate impact on the availability of water, land, forests, etc. For wherever the extensive and widely monopolized production of farm crops is used to generate energy or to improve trade balances, not simply energy or crops are exported but also the resources necessary for their growth . In other words: common pool resources like water, soil, and biodiversity will, de facto, be exported from the country of cultivation along with the biofuels and crops themselves.

The challenge is therefore threefold: first, to safeguard vital resources from the growing pressure to exploit them; second, to ensure that politically and economically marginalized population groups have access to these vital resources; and, third, to

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Innovation unsere Welt revolutioniert (The Wondrous Expansion of Knowledge. How Open Innovation is Revolutionizing Our World). Hannover 2006.

distribute the profits that arise from the commercial use of common pool resources in a fair and socially controlled manner – be it oil (think "resource curse"[7]) or emission allowances.

2) *Economic success is increasingly based on knowledge and information, which are gaining unprecedented importance in the production process*. The value created by many companies largely consists of the intelligent use of knowledge and information. Sectors that particularly rely on knowledge resources are growing very rapidly. Products are becoming more knowledge-intensive, and innovation and product life cycles are growing shorter. This process is also fostered by the fact that intentional weak elements are frequently integrated into product designs, creating even shorter life cycles.

Unlike natural resources, knowledge and information are not limited as a raw input of production. When I pass on information, it also remains with me, even though a third person simultaneously has the same information. But this basic fact about information creates a special problem for capitalists: If something is not finite and is always available, it cannot command an attractive price because it is so abundant. To rescue the industrial society's rationale of capitalist utilization in the knowledge economy and to make knowledge a profit-making product, knowledge goods are artificially made scarce –through copyrights, patents and trademarks -- even though this runs counter to their essential nature, as described above.

The lockdown of knowledge has produced a paradox, however. By using technological and legal strategies to make knowledge scarce, intellectual property law is also hindering innovation, creativity, and productivity in society as a whole.[8] It significantly limits people's access to knowledge and culture, interfering with everyday habits of culture and civic life.

There are other production and business models, however, which are based on the assumption that barriers to knowledge, information, and culture should be kept to a minimum. They challenge the central institutions of the market economy (contracts, private property, and hierarchies) with a system in which no one is hindered from producing due to the property rights of another, as Yochai Benkler writes. Under these scenarios, cooperation does not arise as a byproduct of material incentives or vertical command structures. Instead, sequential and collective production processes offer the freedom for individuals to share and create. People are motivated not only by material incentives but also through a sense of community and reputation.[9] Licenses like the General Public License (GPL) for free software[10] and the Creative Commons licenses for music, video, text and other creative works (which require *distribution under same conditions – the ShareAlike license*), legally ensure that content does not revert to the industrial production and distribution paradigm. Content is kept open and accessible, and can continue to be collectively developed and available for all.

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[7] Most of the developing countries rich in mineral resources have the world's lowest growth and highest poverty rates. Corruption indices in these countries are also very high.

[8] Cf., et. al.: Lessig, Lawrence: *Free Culture. The Nature and Future of Creativity*, The Penguin Press 2004.

[9] Benkler, Yochai: *Commons-Based Strategies and the Problems of Patents* in *Science* 20, August 2004, vol. 305, no. 5687, pp. 1110-1111.

[10] The General Public License (GPL), the third version of which has been published in June 2007 by the Free Software Foundation, licenses free software and other content.

3) Technical progress is tapping ever new spheres and spaces for economic exploitation. Genetic information acquired through gene technology,[11] synthetic molecular biology, and nanotechnology are examples of this trend. Technologies are also colonizing space, minerals in the deep sea, and the electromagnetic spectrum as a means of information transmission. Whatever resource can be appropriated for market use is fragmented, fenced in, or enclosed.

Following an age-old paradigm, as in the days when land was handed over to the conquistadors of distance continents, the newly "developed", supposed "no man's land" – de facto the common of the indigenous populations or global common resources – is granted to the "pioneers of the conquista" for private utilization. Communications expert Rainer Kuhlen[12] called this trend "venterization," in reference to the biochemist and gene technician Craig Venter. The term describes the perfected process of controlled private appropriation of knowledge and its conversion into products that are then traded on information markets.

As technological revolutions converge with dramatic imbalances in the various players' ability to assert their interests, this controlled private appropriation now reaches into the most intimate and remote spheres of our lives – our genes, relationships, and way of thinking and into the resources that are spatially so very distant from us (outer space, deep sea) -- that we barely perceive them as being *ours*.

The battles for clean water and air and preservation of biodiversity in the 1960s were first conceptualized as a struggle to protect "the environment." The cultural invention of that term has been highly useful in advancing a political agenda to guard air, water and soil from marketplace abuses. But now it is time to broaden the scope of our political paradigms. The modern-day commons debate focuses attention on both the erosion of natural resources and the loss of rights by "the commoners" to use and manage the cultural and social resources that belong to them. Our thesis is that the commons discourse can help stimulate cultural awareness and reframe political debate, which in turn can help promote the greening of society and broader access to knowledge and culture. A convergence of movements, as called for by GRAIN, the sustainable agriculture NGO,[13] triggered by the core ideas of the commons discussion, could shake up current political discourse and advance a new vision and paradigm.

Clarifying the Concept of the Commons

We use the term *commons* to refer to a central political concept. It describes goods and

[11] Craig Venter is said to have created a synthetic chromosome in October 2007. Venter became known through his project on sequencing the human genome. For decades, he has been working on creating artificial life, which would lead to the limitless availability and use of the building blocks of human life (http://www.spiegel.de/wissenschaft/mensch/0,1518,509848,00.html).

[12] Kuhlen, Rainer: *Napsterisierung und Venterisierung. Bausteine zu einer Politischen Ökonomie des Wissens* (*Napsterization and Venterization. Building Blocks to a Political Economy of Knowledge*). *PROKLA – Zeitschrift für kritische Sozialwissenschaft (Journal on Critical Social Science*), special edition on the topic of knowledge and property in the digital age. 32, 4, 2002, pp. 57-88.

[13] GRAIN is an international nongovernmental organization dedicated to the sustainable use of biodiversity. *GRAIN: Convergence of Movements to Fight IPRs on Information* in: Seedling. October 2005. http://www.grain.org/seedling/?id=409.

resources that share a special relationship with a group of people, a community. This group perceives or views these resources as being "theirs." In other words, they embrace them as their own -- not in the sense of libertarian property law which sanctions whatever one wants to do, but in the sense of stewardship of the resource and ongoing access and use. In this sense, when we talk about the commons, we are referring to the power of the little word "ours," which encompasses both individual *and* collective needs. The commons is about not only utilizing but also caring for resources and goods, whether they be social, cultural, or natural.

The concept of the commons accordingly refers to a shared ownership relationship, which, at the same time, entails a shared responsibility and shared beneficiary relationship. This relationship does not exist "in and of itself," that is, it is not inherent in the resource or the good. It is a social convention; it is law and norm, whether formal or informal. Or it is a behavioral pattern. In other words, the commons is fundamentally about social relationships. Commons are not the resources themselves but the set of relationships that are forged among individuals and a resource and individuals with each other.

Often public goods and commons are mentioned together in the same breath. While the two concepts overlap, a distinction is to be made between the two:

- *The commons* describe certain patterns of relationships between a good or resource and a group of people. They are inherited or collectively developed and passed on over generations; they are initially invented, but have to be nurtured, maintained, protected, and replenished. "There are no commons without commoning" is one of the central phrases of the commons debate in the English-speaking world. Commons evolve in social practice. They are a verb, not a noun.

- *Public goods,* by contrast, always need a formal decision to be produced and tends to emphasize the economics of a shared resource. Like the *commons,* public goods often serve the function of ensuring the availability of resources to society. The public water supply (as a public good), for example, ensures the availability of the common resource water; libraries (as a government institution) ensure people's access to knowledge and ideas. This, in turn, requires stable political conditions and efficient – mostly governmental – institutions. Both are nonexistent in many parts of the world.

  Public goods are determined by the "triangle of publicness" -- public consumption, public distribution, and public decision-making.[14] Public consumption is defined such that it is generally difficult to exclude "freeloaders" from using this good. Public goods share this feature with some, but by no means all, commons. Local and regional natural resources that are subject to complex administrative regimes generally have very clear access restrictions.

  Public goods are mostly services that use and distribute common pool resources such as healthcare, water provision and public electrification.

[14] Martens, Jens; Hain, Roland: *Globale Öffentliche Güter. WEED-Arbeitspapier (Global Public Goods. WEED Working Paper*). World Summit Papers of the Heinrich Boell Foundation No. 20., p. 12.

A distinction must also be drawn between the (common pool) resources, the property regime, and the "benefit stream" or the products resulting from the resources – in other words, between common pool resources, common property, and the flow of resource units.[15]

Common pool resources are understood to mean the broad diversity of collectively inherited or produced resources (and resource systems) which citizens have a political and moral interest in controlling and managing within their communities. These resource systems can be natural, social, or cultural in nature.

There are good reasons to view resources as common pool resources and to administer and manage them in various forms of collective property (which include common property and public property). These include:

- Resources that constitute our "collective heritage." Natural common pool resources in particular are inherited, not made. Groundwater and surface water; genes; the atmosphere, with its (limited) ability to absorb greenhouse gases; lakes; oceans; a priori land; the electromagnetic spectrum (as a medium for wireless communication); and mineral resources – no individual, no company, and no government has "produced" them. Therefore, no one can rightfully claim them as his sole property and no one is entitled to a larger share of them than anyone else.
- Certain cultural and knowledge goods are similarly inherited and not made by an identifiable subject. These include our spoken and written language. Notes, chords, rhythms in music. Folk songs, fairy tales, and proverbs. Traditional knowledge about medicinal herbs, healing practices and seeds, religious customs, and meditational techniques. In these cases, too, it can be said that no one can rightfully claim what has not been "made" by anyone. The rights of disposition and use are understood as a priori collective rights.
- Common pool resources, furthermore, are fundamental to human life and to any kind of production and reproduction. Sustainability and ensured availability for humanity should be fundamental principles of any common pool resource management.

Notwithstanding these facts, administering common pool resources as common property is not a natural law. Rather, the question of how to arrange property rights to common pool resources is the subject and result of ongoing and fierce social struggles worldwide.

We are positing the political need to establish and maintain societal or community control over common pool resources. That offers the best way to stabilize and continuously revitalize the relationship between resources and society. This is true no matter what sort of property regime is established. One of the most important findings of empirical commons research is that the crucial political question is *not* how to allocate property rights. Public, private, and common property regimes have all

[15] Hess, Charlotte; Ostrom, Elinor: *Artifacts, Facilities, and Content: Information as a Common-Pool Resource*. Bloomington: Indiana University. Workshop in Political Theory and Policy Analysis, 2001. pp. 55-57.

succeeded and failed to ensure long-term, efficient commons management.[16]

There are, however, numerous historical examples of communities managing common property resources sustainably over the long term. It is difficult to generalize from these examples, but there are many instances of complex, self-organizing processes in which citizens develop management systems that secure and manage shared resources effectively. These cases reveal an often overlooked third approach to resource management, one that protects human rights and social equity while preventing concentrated control by a few individuals or groups.[17]

Property rights are bundles of rights to access, extract, manage, exclude, and sell, in various combinations. This list is not complete, but, for our purposes, it is sufficient. The generally understood notion of "property" today – the unlimited right of rule in the sense of "dominion" – implies disposal over movable and immovable things at one's pleasure, without impediment. This notion of absolute ownership – stemming from Roman law – has found its way into nearly all modern legal systems. The owner may use and consume or destroy the property at his pleasure so long as it does not conflict with the law or the rights of others.

In contrast to this practice, there are collective property systems that take into account the unique feature that several people have a right to dispose over the particular resource. Under these systems, it is not possible to destroy or sell the resource without harming the co-owners.

Thus, a crucial point is how extensively the rights of disposition are defined within a particular property regime. In our view, absolute individual property rights ("dominion") must be ruled out in respect to common pool resources. This results in the need for a commons-based property regime, for example, by elevating undivided co-ownership in combination with private rights of use. In other words, the restrictions on dominion over common pool resources must be redefined.[18]

Normative Claims Relating to Common Pool Resource Management

To talk about the commons is essentially to address the quality of the relationship between social beings and resources. Regardless of whether something is managed by the community (e.g., springs, streams, forests, pastures, traditional knowledge); by the government or multilateral institutions (national parks, stores of knowledge, fish stocks in an exclusive economic zone, atmosphere); or even privately managed, a number of normative claims arise (which vary according to the nature and function of common pool resources):

- *Fair access*: All members of the respective community, the co-owners, gain the same access. This implies fair access restrictions, especially in the case of

[16] Cf., et. al. van Laerhoven/Ostrom: *Traditions and Trends in the Studies of the Commons* relating to forests, in IASC Journal, vol. 1, No. 1, 2007, pp.3-28.

[17] Cf. esp. Ostrom, Elinor: *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University 1990. Also, Rowe, Jonathan: *The Parallel Economy of the Commons,* in State of the World 2008, pp. 138-150.

[18] Cf. Simonis, Udo Ernst: *Ökologischer Imperativ und privates Eigentum* (*Ecological Imperative and Private Property*). Discussion paper FS-II 97-403, Wissenschaftszentrum Berlin, 1997.

natural resources.

- *Equitably shared benefit*: Like the historical commons, today's common pool resources are also economically productive. The proceeds[19] derived from a common pool resource should benefit everyone in a fair manner.[20]
- *Responsibility for preserving the resource*: "We have only borrowed the earth from our children," was an early slogan of the environmental movement. It expresses the idea that we must pass on all that we have inherited, undiminished – ideally even replenished, healthier, and more productive – to future generations. A right to sell the resource itself is thus incompatible with this idea, because it would betray the principles of stewardship.
- *Democratic and transparent decision-making*: The beneficiaries of the common pool resources, in principle, have the same rights of participation. Decision-making pertains to all major questions of access, control, use, and distribution of the generated wealth. It is to be understood as a process whose function is also to make people constantly aware of their shared responsibility for the commons. Exercising these decision-making rights in actual practice is what, in fact, makes a resource a commons.

So, when we speak of something as a commons, when we think of it as generally belonging to the community, we simultaneously voice claims and requirements about the process of managing it and for what ends, thus distinguishing it from a private good. These requirements are the key elements of the concept of the commons as a political paradigm.

Ideas and concepts are increasingly becoming the core and source of innovative, creative, and productive activities. Cultural and knowledge goods that can be attributed to a certain author or a certain creator, inventor, composer, researcher, or programmer are an expression of an individual creative process that is always based on stores of collective knowledge and culture. Music is created from basic elements: notes, rhythms, chords, accents, and motifs. These are the "common pool resource." Anyone who composes a musical piece – creating from countless past musical works, the result of similar individual and collective creative processes – produces something new in the special arrangement of pre-existing resources: new music. It is that author's work – but it draws upon a cultural commons of the mind.

From the individual creative process, certain rights accrue to the author. They are laid down in copyright law. Here, a distinction is to be made between the author's personal right[21] and the author's licenses. If the use of licenses follows the logic of exclusion – or, as copyright law puts it, "All rights reserved" – it will have a direct, extremely restrictive

[19] This refers to solid cubic meters of wood extracted from forestland, rations of animal feed mowed from meadowland, the kilograms of food fished from waters, the information and products derived from traditional stores of knowledge or scientific databases.

[20] In terms of both access and use, the benchmarks used to measure "fairness" would be the subject of the general theory of fairness and are not specifically discussed here.

[21] Under European law, the author's personal rights (right to publish, right of authorship, right to prohibit the distortion of the author's work, the title, etc.) are tied to the author and are inalienable.

impact on access and the possibility of further creative development by consumers and society. "All rights reserved" is still the cultural and legal norm. Industries that rely upon copyright law use many legal and technological measures to try to enforce this norm in an age where the costs of reproducing digital information and works are approaching zero.

Music, for example – whether burned onto CDs and sold through conventional retail stores or as a fee-based download on the Internet – is recorded and marketed by production companies (the labels) according to the functional principles of industrial society. This business model of the labels is based on making music artificially scarce and artificially increasing the cost of gaining access to it.

The question, from the perspective of the commons, is, How legitimate are such strategies of making products scarce? To create a work or new content, authors cannot avoid drawing on the pool of common resources, which are then inevitably made "scarce" along with the created work. One must also ask, Who assures that "too much" is not taken from the cultural commons and made private? Who looks out for the interest of the general public by assuring that newly created music will at some point be made available to enrich the cultural commons?

The public-domain rule for authored works and compositions is a generally appropriate tool to limit the author's licenses and thus ensure a fair balance of interests between authors and society. However, these periods, which have been constantly expanded over the past 80 years, need to be significantly shortened in order to promote the commons of the mind. Currently, works enter the public domain and can be used by everyone seventy years after the death of the author – an extraordinarily long period of privatization that usually exceeds the commercial viability of works.

A significant and ingenious set of solutions to this problem are the free licenses such as the GPL and some Creative Commons licenses that enable authors to make their works available to the general public while preserving their personal rights. People can access and use knowledge and culture without the normal copyright restrictions, which allows an ethic of "share, reuse, remix" -- the commons of the mind -- to flourish. In contrast to natural resources, which tend to be finite and depletable, open access to knowledge and culture is an important precondition for developing the commons of the mind.

Common Pool Resources and Communities

> *By the social element I mean the whole range from the right to share in a modicum of economic welfare and security to the **right to share to the full in the social heritage** and to live the life of a civilized being according to the standards prevailing in the society.*
>
> *Thomas H. Marshall*[22]

Managing common pool resources in a practical sense requires a community that becomes aware of its relationship to the resources in a social context and names the

[22] Marshall, Thomas H.: *Citizenship and Social Class*, in *Citizenship and Social Class*, Frankfurt/Main 1992, p. 40 (author's emphasis).

resources as *its own* – a community that claims them, a community that presses for and helps enforce rules to respect this co-ownership. That is why the slogan of onthecommons.org[23] is so apt, for one of the first tasks of the commons debate is "to name it, to claim it, and to protect it!" We can only be aware of that which we can name.

Yet it is not always easy to answer the question of what specific community is related to what resource and what rights arise from this relationship. For example, indigenous communities worldwide act and heal with their knowledge about the power of the plants within their respective ecosystems. They live and feed themselves from their ecosystems. It is their every right. Local communities are especially entitled to use the resources of their ecosystems. But, at the same time, the genetic information that is inscribed in the substance of plants is intangible information that has global significance and arguably belongs to all of humankind. The expansion and transmission of traditional knowledge is also tied to the existence and use of physical materials.

It thus becomes clear that natural, intangible and cultural resources are closely intertwined. They can be both specific and local (the plant itself) *and* infinitely reproducible and global (the information encoded in every plant). The local people are directly entitled to the one; the other only belongs to them as part of humankind. This ambiguity means that the scope of a given community's rights of disposition and use of plants and plant genetic information is often hotly contested. The Convention on Biological Diversity (CBD) and other international agreements on plant genetic resources are attempts to draw lines between what belongs to a community and what to humankind. According to the CBD compromise, biodiversity is assigned to the respective nation states; the plants are thus defined as "public property" managed by governments. That may be a form of progress, but it does not guarantee preservation of plant resources.

Without preservation of small-scale natural ecosystems, without acceptance of the rights of the people and communities living there, the global biodiversity to which we all have a claim cannot be preserved. The one is inextricably linked to the other. However, to make matters more complicated, the communities that share a relationship to a particular resource is not always clearly identifiable and it is not always clear which communities should have privileged access or not. Therein, among other things, lies the special complexity of the commons debate, which defies simplistic answers.

It appears that we can only answer the crucial question of which specific community is committed to which common pool resource on an individual basis, as the case arises. Nonetheless, it is possible to cite some of the dimensions that prove helpful in making more intelligent judgments:

– *Spatial dimension*: The existence of physical boundaries, to define the relevant community – say, the inhabitant community of a watershed.

– *Temporal dimension*: Ownership rights inherited over generations, a value that common law has traditionally honored; knowledge and natural resources preserved by indigenous communities.

[23] See http://onthecommons.org/

– *Dimension of (already assumed) responsibility*: This dimension applies to production, preservation, and reproduction of the resource; e.g. programmers who, without constraints, maintain and expand software code in an international network or indigenous communities who, in addition to their local ecosystems, have been maintaining global immaterial common pool resources for centuries. Such demonstrated stewardship is seen as presumptively entitled.

– *Dimension of functionality*: Communities can only assume concrete responsibility for common pool resources when they are able to agree directly on the rules, principles, and institutionalization of management. The principles of management must be established and accepted. This is also conceivable under traditional democratic governments, through the principle of delegating responsibility to a trust, a government agency or other trustee institution.[24]

Global common pool resources in particular, such as the oceans, seabed, universe, and atmosphere, cannot be assigned to any definable community, but belong to all human beings equally.[25] They have been historically treated as "no man's land." So the "tragedy" is not inherent in the commons but rather a more general problem of human society co-existing with the Earth. The Garrett Hardin metaphor of the "tragedy of the commons" is, as has often been analyzed, a tragedy of territory that is open to all, without rules or restrictions.[26]

This is well illustrated by the example of the atmosphere. So long as there was no risk of overuse, it was treated as nobody's concern. It could be viewed as an orphaned commons. The same applies to outer space, which is littered with space debris, as well as to the deep sea or the Arctic.

In the case of the atmosphere, the climate crisis now calls for a shift in perspective. It is urgently necessary that we all voice the same claim of entitlement, which arises from our understanding of the atmosphere as a commons, instead of surrendering this resource, by virtue of our inaction, to arbitrary misuse by individuals. The perspective we need to adopt is that the atmosphere belongs to all of us. This collective claim of entitlement implies that my individual rights of use are limited by the collective interests of everyone else.

Beyond the complexity of assigning a resource to an entitled community, the concept of the commons must also be updated in light of the "new commons" created through digitalization and the transformation to a knowledge society. As already seen, we are not just talking about local communities. In addition to urban communities worldwide or to indigenous communities defending their natural resources, we are, at the same

[24] These dimensions are also described in the text by Jean Pierre Leroy: The Guardians of our Future. Territorial Management in Gurupá. In this web-dossier.

[25] For example, a "moon treaty" stipulating this right does, in fact, exist (follow-on to the Outer Space Treaty). All ownership claims to the resources of the moon are assigned to the international community – or to all people equally – in this treaty. No one is to be privileged through personal ownership of outer space. However, only 16 states have signed the treaty, which was submitted to the United Nations in 1979. It is thus considered to have failed. The next generation will determine what consequences that will have, because claims will not be staked out until the technology is suitable to exploit the mineral resources of the moon.

[26] Cf., among others, Lerch, Achim: *The Tragedy of the Tragedy of the Common,* in this web dossier.

time, talking about delocalized, global communities that exist in cyberspace. People who are linked from Sydney, Mexico, and Namibia via the Internet are accessing, using, and expanding *their* shared resources. As more people around the world participate in online communities, they are developing a new kind of global citizenship. Our traditional understanding of modern citizenship must begin to incorporate new realms of our lives, new commons, and the "right to share to the full in the social heritage," as expressed by Thomas H. Marshall in his classic essay on citizenship.

"There are no commons without commoning," as Peter Linebaugh puts it. There are no commons without caretakers interacting in various social relationships. Yet it is essential that the commoners assume concrete responsibility for the resources. There can hardly be any assumption of collective responsibility without communication between members of the community; without a high degree of acceptance of the rules, reciprocity, and cooperation; and without a functioning and transparent decision-making process. These are high expectations for the quality of communities and thus – on an individual level – for the quality of citizenship. This quality is rather rare in heavily individualized societies or in societies under enormous socioeconomic pressure.

Yet, by the same token, when groups of people assume responsibility for managing common pool resources, it also generates a sense of community, because the necessary communication processes create a bond. These processes (re)produce social cohesion, foster responsibility and public spirit and, thus, common welfare. A community that protects its watershed, that maintains its public places and has spaces to preserve and expand its traditional stores of knowledge creates a social fabric, a web that sustains it.

Also, some things, by their mere existence, foster a sense of community: the village fountain, the legendary baobabs of West African village squares, cafes, and lively public places. Today, remarkable innovations in software are creating new spaces in which new types of communities around the globe can grow.

The vital role that commons play in production and social cohesion should be developed as a crucial line of argumentation: We believe that commons must not be disassociated from their unique relationship to the community. Commons *are* communities, and they help promote personal responsibility, social cohesion, and sustainable management of often-endangered resources.

We are not speaking out in favor of a romantic idea of society. We are not referring to premodern concepts of community that are opposed to the idea of the modern individual. But we do, indeed, reject the notion of reducing the individual to his role as a consumer, contractual partner, and seller of his labor. The individual also achieves self-realization by taking responsibility for common welfare and the commons – local, regional, and global. This, too, is part of a modern understanding of citizenship. In contrast to the objectifying assumption that the individual is a strictly utility-maximizing *homo economicus* –- "Economic Man" – people are also guided in their actions by reputation, a sense of solidarity, and reciprocity. Or as Karl Polanyi expresses it, "Man's economy, as a rule, is submerged in his social relationships. He does not act so as to safeguard his individual interest in the possession of material goods; he acts so as to safeguard his social standing, his social claims, his social assets.. . . In every economic

system, the maintenance of social ties is crucial."[27] Polanyi furthermore asserts that when economic activity is detached from social relationships, this brings with it catastrophic social uprooting. The truth of this dynamic is vividly clear worldwide.

We think that the quality of the commons, as a special aspect of the relationship between resources and the community (communities), is closely tied to these processes of uprooting. We assert that there is a clear causal connection between social division and access to common pool resources and public goods, which can be empirically shown.

We assume that the ability of society, every society, to develop, vitally depends on how it succeeds in meeting the challenge of ensuring fair access to and active participation in the commons and of guaranteeing ecological and social sustainability. The debate on who is responsible for our collective resources is thus also a debate on some fundamental principles of social organization.

The Commons as a Subject for Political Discourse

As we have seen, the discourse on the commons sheds new light on numerous processes of establishing political and legal rules. One example of this is emissions trading. It makes a difference whether one assumes that the atmosphere belongs to everyone a priori as a common pool resource or whether one rejects this assumption. In the latter case, the decision on how to distribute emission allowances becomes an administrative act, which can be measured solely by criteria of economic rationality. If, on the other hand, one views the atmosphere as a common pool resource, citizens have concrete claims to access and democratic co-decision-making. One proposal based on this idea is elaborated in the model of an alternative emissions trading scheme – the Sky Trust.[28]

In the case of providing populations with potable water, social and political conflicts are often sparked only in later stages of production and distribution – when the question arises as to who will specifically dig the well, lay the lines, and collect the fees. There is abundant empirical evidence that, when social controls are lacking, private provision and distribution result in significant tradeoffs in the quality of service, resources, and fair access.[29] On the other hand, the government also does not always guarantee that the principles of responsible commons management will be respected. Inefficiency, co-opting for individual interests, mismanagement, and corruption are ubiquitous in the world. The critical first question is whether private property rights shall be considered the paramount value or whether the citizenry's co-ownership and shared responsibility for a resource is more critical. The choice made will affect what sorts of access and usage rights people will enjoy, and under what terms.

As important as it is (and will remain) to discuss the pros and cons of various property

[27] Polanyi, Karl: *The Great Transformation. The Political and Economic Origin of Our Time*, Frankfurt/Main 1990, p. 75.
[28] Barnes, Peter: Carbon Capping – A Citizen's Guide. Tomales Bay Institute 2007. http://www.capanddividend.org/files/CarbonCapping_CitizensGuide.pdf
[29] HALL, David & LOBINA, Emanuele: Agua, privatización y ciudadanía. In: ESCH, Sophie et al. (eds.): La gota de la vida: „Hacia una gestión democrática del agua". Ediciones Böll, 22, Mexico 2006.

regimes, the discussion often runs the risk of repeating underlying patterns of ideological debates. It seems more productive to take up the central impetus of the commons debate, in other words, to begin concretely from the nature of the disputed resources.[30] Thus, we should start by considering the socioeconomic and cultural circumstances of the relevant community (communities) as well as the effectiveness of existing formal and informal legal systems for managing and defending (social) control over the resources.

The one who is entitled to common pool resources is not always the one to whom they belong in a property rights sense. Differentiating claims of use as participants and co-owners from de facto allocated property rights thus sheds new light on the problem. To talk of the commons is to move beyond the dichotomy of *public* versus *private*. The commons helps focus attention on rights and duties, on freedoms and responsibilities of citizens in making sure the resources remain commonly available. It focuses attention on the quality of the bond between us and our collective heritage.

To speak of bytes and genes, water or the atmosphere, and many other resource systems as commons, is anything but trivial. We are not splitting hairs but describing a fundamentally distinct concept that leads to new sorts of political arguments and a diversity of institutional solutions. The commons debate always posits the sovereignty rights of the respective community, this and future generations, to dispose over their common pool resources. That is the main shift in perspective made possible by the debate.

Commons and Diversity

Commons management must be diverse – as are the various resource systems in their varying relationships and legal systems. "We cannot be purist with the commons. It is never only about *one* commons and never only about *one* community," says Christine von Weizsäcker.[31]

The manner in which common pool resources are managed will depend on numerous variables – especially in respect to the quality of the resource and the degree to which the relevant community is rooted in its culture, society, and economic system. Commons theory does offer models of successful collective action but not universally applicable political prescriptions. Rather, the institutional solutions will always be multifaceted and complex.

If it is true that diversity is the most important stabilizing principle in nature and society -- that it is the only principle which provides humankind and nature with many possibilities and solutions -- then the strength of the commons debate is that it defies simplistic prescriptions for political action. This strength is, at the same time, its limitation. For when politically charged conflicts demand solutions, the commons – for

[30] Are natural or immaterial resources at issue? Are cultural or social systems involved? Local, regional, or global? Are the resources disappearing or multiplying through use?

[31] *Gemeingüterschutz zwischen Diversität und globaler Verantwortung (Protecting the Commons: Between Diversity and Global Responsibility)*, conference of the Freiburg Kant Foundation and the Institute for Political Education, Baden-Württemberg e.V., Nov. 30 – Dec. 1, 2007. Transcript of the working group meetings.

now – does not provide a suitable battle cry. It supplies direction and a nuanced analysis of the circumstances. The commons debate offers not a blueprint but a programmatic bracket, a new vision.

Conclusion

When we reflect on the commons, it expands the classic dichotomies of the haves and have-nots, of owners and non-owners, of public and private to include the missing third element: the participants, co-owners, and citizens within their communities. Awareness of co-ownership – as a relationship of responsibility and participation by *everyone* – contrasts with the fundamental (social) division into owners and non-owners.

The discussion on rights to access and use the common pool resources is based on questions that are constituent to all social systems – regardless of whether those systems are agriculturally, industrially, or post-industrially structured. The commons debate also picks up on the motives of political action taken by both the progressive and conservative camps, which are embedded in the history of ideas. What the conservatives perceive as protecting creation, is viewed in the leftist tradition as defending collective ownership against private appropriation.

In the search for a modern, progressive political program, the commons debate also makes possible an alliance-building and, exceptionally productive link between milieus which otherwise share little in common. We refer to all milieus which are coalescing around concepts such as sustainability, knowledge society, democracy, and fairness. They offer new approaches under the changed conditions.

The concept has the potential to evolve into a new, big story: for a future of social cohesion, supported by ties to our natural, social, and cultural resources.

The Commons of the Future

Building Blocks for a Commons-based Society

Christian Siefkes

HEINRICH BÖLL STIFTUNG NORTH AMERICA

The Commons of the Past

In many times and in many areas, production was organized around a **pool of commons**—resources that were jointly used and managed by a community of people, according to some community-defined rules. In many societies, water, air, forests and land have traditionally been "in the commons." They were managed and used by larger or smaller groups of people, but they could never become private property in the modern sense of the word, with an extensive bundle of exclusive property rights granted to the property owner (cf. [On the Commons 2006]).

To give but one example, large parts of European agriculture were organized around a system of *open fields* during the Middle Ages. Each village had several large unfenced fields that were farmed by the families of the village. Each family was randomly allocated several stripes of fields to farm for their own usage; each family got stripes in different areas and the random allocation process was regularly repeated to avoid families ending up with only god or only bad land. The heavy plows and the oxen pulling them were also often shared by several families; and the livestock of all families grazed on common pasture lands (cf. [Hepburn 2005], [Wikipedia: Open Field System]).

Contrary to the myth spread by Garrett Hardin in his "Tragedy of the Commons" article [Hardin 1968], commons where not "anything goes" areas which anybody could use and abuse at will. Rather, there were community-defined rules stipulating how a commons could be used, protecting it from overuse, privatization and other forms of damage. The eventual demise of commons-based systems was due to a systematic process of "enclosure": of driving away the villagers from the commons and privatizing the formerly common resources. The commons did not collapse, they were "stolen," as common sentiment at that time expressed it (cf. [Hepburn 2005], [Wikipedia: Enclosure]).

The Commons of the Present

In many parts of the world, such common resources are still an essential basis of society. Additionally, several new communities which base their practice on the shared goal of creating and preserving a commons have emerged. The *free software community* has created a commons of hundreds of thousands of software programs that anyone can use, adapt, and pass on to others (in original or adapted form), as long as they comply with the rules defined for free software. These rules mainly serve a twofold goal: they protect the creators of the commons (by restricting/excluding warranty and protecting against misattribution) and they protect the commons themselves (from being privatized). There are two forms of protecting the commons (the created software) against privatization (enclosure): in the weak form, free software is governed by a *license* which ensures that the software will remain in the commons forever (even if the creator would like to privatize it again), but which doesn't protect *derived works* created by modifying the original software. The strong form, called *copyleft*, extends this protection: it postulates that any derived works must be licensed in the same way as the original work (if they

are published at all), thus ensuring that all derived works will become part of the commons, too. The weak form of protecting thus ensures, at least, that the commons can never shrink, while the strong form actively encourages its growth.

The free software community, which sprang up in the 1980s, was complemented in the 1990s and early 2000s by a *free/open content community* setting out to create a commons of *content* (text, music, movies, and other media). So far, the most impressive outcome of this community has been the *Wikipedia*, "the free encyclopedia that anyone can edit," whose English edition now contains more that 2 million articles. Just like the free software community, the free content community knows a strong and a weak form of protecting the commons they create, often using the *Creative Commons* family of licenses to do so.

There are many related communities sharing and managing a self-organized commons in a similar fashion. The *open access community* is turning scientific knowledge back into a commons (as it traditionally had been), by encouraging the free sharing of scientific publications and of the data required for and obtained by scientific experiments. *Wireless community networks* are self-organized computer networks that provide open access points to the Internet and allow free data transfer to other computers. *Community gardens* are small pieces of self-managed common land which have emerged in many places around the world, often in urban environments, providing a connection to nature and a sense of community to the people who cultivate or visit them. And the *BookCrossing* community is passing books that you no longer need on to others, based on the idea that books are meant to be read, not to sit uselessly in shelves. These are just a few examples of the phenomenon for which Yochai Benkler [2006] has coined the term *commons-based peer production* (though the last example is more about distribution than about production). Rowe [2008] gives a nice little overview over both the commons of the past and of the present and the ways in which they are connected.

The Commons of the Future

Are these new commons-based communities just a fad, or are they indicators of a serious new trend? Will there, maybe, even be an economic paradigm shift—will future production increasingly take place around a jointly organized and jointly managed commons, rather than around the exchange of private property on the market? I believe that we can indeed expect such a paradigm shift [Siefkes 2007].

If such a future commons-based economy emerges, it will probably resemble the commons of the present more than the commons of the past: it will often use the Internet for global cooperation and coordination; it will rely on the powers of automation and modern technology to make production easier and more versatile. There won't be oxen pulling plows.

Two traits which the commons of the past and of the present have in common are that commons need *communities* (without sufficiently strong communities of people willing to create, maintain, and protect them, all commons would or did fall into disarray or become privatized) and that these communities make their own *rules* to protect and strengthen the commons (the conventions of the open field system and the licenses of free software are examples of such rules). Apparently, these are necessary preconditions for commons to flourish. **Any future commons-based society will thus likewise be a community of people making up their own rules for creating, maintaining, and handling the commons.**

The characteristic trait of such a society will be that **production will be based on commons.** If we take this seriously, it means that the resources required for production and the goods that are produced will go into the **pool of commons,** and that the goods which people consume or use will come out of it. Such a pool of commons won't emerge by itself, it needs a community of people who maintain and support it, as all commons do. Production around a pool of commons thus means that **people enter a joint agreement to help each other produce what each of them needs.** It becomes their joint responsibility to preserve and protect the common resources of the Earth that make production possible, and to create and maintain a pool of common means of production and goods that is sufficiently large and versatile to provide for everyone's needs and wishes.

The core task of a commons community will therefore be to find out how best to handle this joint responsibility—to find out which rules and agreements work best to ensure that the pool of commons can indeed play its intended role. In my book [Siefkes 2007], I speculate about which specific rules such a community might give itself in order to do so. My point is *not* to predict the actual rules which such a community will follow. These rules will certainly vary over different areas and different times—the respective communities will find out which rules work for them, as the commons communities of the past and present have done. My point is to show that it is *possible* to successfully organize the commons-based production of everything, not just of free software and the Wikipedia.

Which general principles might we expect of such an agreement to handle the joint production of everything? While my book describes and motivates details, the following is a very high-level overview of the core ideas:

- **Everyone can give as they like.** That's what we already see in free software and related communities: people self-select to do things which they consider important or which they like to do—incidentally, the things which people like to do most often are also the things they do *best.* Of course, this does not mean that every contribution will be accepted (as it doesn't in free software): just because you fancy that you could be a doctor doesn't mean that people will trust you to operate them.

- **Taking from the commons means taking something as *possession*** (something that can be used), **not as *property*** (something that can be sold and commercialized at will). The difference between *possession* and *property* is simple to explain: the apartment which I have rented is in my possession (I'm the one who uses it), but it is the property of my landlord or -lady (she's the one who owns it and has the right to sell it). Commons can often become possession, but never property. For example, fields in the open field system become the temporary possession of the family who got the right to farm them. Likewise, anybody can take free software into their possession (by downloading and using it), but nobody (not even the initial creators) holds full property rights over them (the creators cannot exclusively sell or license the software to a company, since they already donated it to the commons).

  - If goods can become possession, but not property, this also changes the purposes of production. In capitalism, production usually takes place for *profit,* but profit requires property. Where there is no property, production is therefore driven by other motives: people help to produce something because they want to have it, they self-select themselves to do tasks which they enjoy doing, or they support production in order to give something back to the community. There are ample reasons why production takes

place even where there is no profit.

- **Everyone can take commons into possession, as long as they don't take them away from others.** That's what we see from the commons of the present: everybody can freely take software, content, and other kinds of information without having to give anything back, since by taking them you don't take them *away* from others: everybody else can just make another copy of the software and use it, too. This works for everything that can be copied at practically zero cost.

- **If taking would mean taking away, the best way of solving this problem is to produce enough to satisfy everybody's wishes.** If things cannot be copied freely, taking needs social agreements. Say there is only one bicycle left in the commons, but there are two people who would like to take it. Neither of them can just take it at will, since doing so would take it away from the other person (she would deny the other one the possibility of taking it). Since things such as bicycles are *produced*, this is not necessarily a problem: it might be possible to produce enough of a good (two bicycles, in this case) in order to satisfy everyone's wishes. Doing so is an organizational challenge for the commons community: it has to arrange production so as to ensure that there are enough goods for those who want them, thus avoiding that taking becomes taking away.

  - Let's have a look at what this can mean in practice. Organizing production requires *effort* (time which people spent to actually produce the bicycles and other goods needed), and the community must therefore find a way to distribute this effort. It is possible that effort will distribute itself more or less spontaneously, if everybody self-selects themselves for the tasks they like do and does as much of them as they deem appropriate. If and when this isn't sufficient to distribute all effort, more explicit agreements will be necessary, say by coupling giving to and taking from the commons. In my book I mainly discuss two ways of doing so: either distributing effort evenly among participants (*flatrate* model: everyone contributes about the same amount of effort, regardless of how much they take) or else distributing it roughly *proportionally* to the effort required to satisfy everyone's wishes ("the more you want, the more you have to give"). Some further details and possible modifications follow automatically from the logic of commons-based production (for example that those who cannot contribute effort won't have to, since the goal of effort sharing is to ensure that enough is produced to satisfy people's wishes, not to exclude anybody). There may be other ways to share effort depending on the character of the resources at stake and the respective communities.

  - When effort is distributed, there will probably be a few tasks that nobody (or not enough people) wants to do, say because they are annoying, dirty, dangerous, or just plain boring. The commons community will have to find a way to distribute such tasks as well. One way of doing so is to "weight them higher," i.e. to count short times of doing such a task as equivalent to longer times of doing other tasks. If I have to decide whether I would rather spent twenty hours writing software or else five hours removing garbage I might feel more inclined to choose the latter task, even if I consider it less pleasant.

- **The second best way is to distribute limited goods in a fair manner.** If it's not possible to produce enough of a good to satisfy all demands, the commons community

will need ways of deciding who takes precedence. In my book, I discuss *auctioning* as a possible way to do so: those who are ready to contribute most *effort* in order to get the limited good will get it. By doing so, they will not only get the good they like to have, but they will also alleviate the task of co-producing the commons for everyone else: since the overall effort required for production stays the same, everyone else will have to contribute slightly less. Auctioning can also be used to allocate natural resources that aren't available in sufficient quantity for everyone who wants to use them, while other natural resources would be available for free (but only for *using* them, not for *using* them *up*).

- Other solutions to the priority problem are possible, too. A community could, for example, try to satisfy urgent demands first, or it could trust the people involved to figure out among themselves who should take precedence. The commons communities will have to find out which approach works best for them—quite likely they will end up using a combination of several approaches.

- **Cooperation will be organized by area and by interest, and units of cooperation will nest and overlap as appropriate.** There will probably be lots of *commons-based communities* around the world, each of them organized by and for the people living in a certain area and managing the commons that occur in that area. These regional communities will cooperate with each other as reasonable to handle activities that can better be organized at a larger scale, and to manage and share common resources that are unevenly distributed. Cooperation in regional communities will be complemented by cooperation in *projects* setting out to produce some specific good, where each project comprises the people interested in producing this good and willing to cooperate with each other (this generalizes the language use of the free software community: a "free software project" is the group of people designing, implementing, and testing a specific free software program). Based on the experiences of the past and present, we can assume that each regional community and each project will find the rules and structures that suit them most, and that communities and projects will cooperate and join forces when it makes sense for them to do so.

- **Production will take place in projects of people who work together on an equal footing (as peers).** When Benkler talks about "commons-based **peer** production," he means that there are no command structures in the projects he describes—nobody can order others to do something, and nobody is forced to obey others. This does not mean that there are no structures—on the contrary, there are often maintainers who steer the course of a project and decide, for example, which contributions to accept and which to refuse. But while maintainers can prohibit participants to do things that they consider harmful to the project (throwing them out if they don't comply), they can never order anybody to do anything they do not want to do—all they can do is try to *convince* people that doing something makes sense. Moreover, nobody is forced to accept the existing structures as they are. If participants of a project are unhappy about some aspects of the project they can try to convince the others to change them. If that fails, they can still *fork* the project: they can break away from the others and do their own thing.

Commons-based societies worked successfully for centuries, until they were destroyed by the enclosure process accompanying the advent of capitalism—a process which is still going on in

parts of the world. At the same time, capitalism has also produced the modern technologies which have made a new generation of commons possible. The renaissance of the commons is in full swing, and there is no reason why it should loose its momentum any time soon. A future commons-based society—**commonism,** as Nick Dyer-Witheford [2007] proposes to call it—might still be a few generations away, but the tendency is clear.

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