



# **Transnational Republics of Commoning: Reinventing Governance Through Emergent Networking**

By David Bollier<sup>1</sup>

Four days after the 9/11 attacks in 2001, the pilot on United Airlines Flight 564, going from Denver to Washington, D.C., came on the intercom:

The doors are now closed and we have no help from the outside for any problems that might occur inside this plane. As you could tell when you checked in, the government has made some changes to increase security in the airports. They have not, however, made any rules about what happens after those doors close. Until they do, we have made our own rules and I want to share them with you.....

Here is our plan and our rules. If someone or several people stand up and say they are hijacking this plane, I want you all to stand up together. Then take whatever you have available to you and throw it at them.... There are usually only a few of them, and we are two-hundred-plus strong. We will not allow them to take over this plane. I find it interesting that the U.S. Constitution begins with the words, "We the people." That's who we are, the people, and we will not be defeated.

As recounted by journalist David Remnick, passengers "were asked to turn to their neighbors on either side and introduce themselves, and to tell one another something about themselves and their families. 'For today, we consider you family,' they were told. 'We will treat you as such and ask that you do the same with us.'"<sup>2</sup>

In moments of crisis, when the structures of conventional governance are suddenly exposed as weak or ineffectual, it is clear that there is no substitute for ordinary people acting together. Although individuals may have small spheres of influence, collectively our choices and agency are the ultimate guarantors of any values we may wish to secure. In any successful scheme of governance, it is not enough for institutions to exercise control; individual initiative and collective commitments must be actively enlisted and nourished as an ethos. The superstructures of law and governance can achieve only so much without the consent of the governed.

People must be able to actively participate in governance for another reason: their sovereignty will otherwise be usurped by state institutions and moneyed interests. That is essentially what is happening today as political elites consolidate power and erect barriers to meaningful democratic participation. Governments are more capable of engaging in extra-legal behaviors and political favoritism, ignoring the long-term common good, and sanctioning rapacious exploitation of the Earth.

A key political challenge of our time is to figure out new ways to preserve and extend the democratic capacities of ordinary people and rein in unaccountable market/state power, otherwise known as neoliberalism. This is a daunting challenge because today's nation-state system, in alliance with large corporations and financial institutions, is profoundly hostile to genuine democratic empowerment. Neoliberal economics and policy insist upon debt-driven economic growth, extractivist uses of the Earth, consumerism and nationalism as the central goals of modern societies. It provides very little space – legally, culturally or politically – for citizens to imagine and develop serious alternatives.

## I. TOWARD NEW FORMS OF OPEN SOURCE GOVERNANCE

This essay explores a promising path for moving beyond our current impasse. I argue that the creative use of new digital technologies on open network platforms could inaugurate liberating new forms of “open source governance.” Tech infrastructures and software are enabling ordinary people to meet basic needs and self-govern important aspects of their lives. They can create their own cultural spaces to deliberate, collaborate and share resources without market and state structures that are often cumbersome, expensive, anti-social or predatory. This paradigm shift is not just conjectural; it already well underway, as analysts such as Jeremy Rifkin, Yochai Benkler, Don Tapscott, Michel Bauwens and Paul Mason have documented.<sup>3</sup>

To be clear: this is not an argument that states and transnational corporations will disappear, or that bioregional social economies will suddenly eclipse capitalism. My argument is more modest – that new tech platforms offer practical, politically attractive pathways for reinventing the market/state as now constituted and developing a more robust, potentially transformative Commons Sector.

Predicting the future is an inherently risky proposition, especially when there are so many active variables shaping today’s world. Still, the innovations now unfolding in various tech spaces suggest the outlines of new post-capitalist institutions that, with struggle and luck, could transcend many of the structural and cultural problems we face today. In the next section, I explore some of the more promising ones. They include new types of group deliberation and governance software platforms such as Loomio and Co-budget; digital platforms that enable better management of ecological resources; and “blockchain ledger” technology, which is enabling new forms of network-native self-organization, collective action and “smart contracts” that bypass the conventional legal apparatus. They also include new types of *online guilds* that blend market activity, social cooperation, philanthropy and friendship; *urban commons* that reinvent city bureaucracies and empower citizen initiative; *open design and manufacturing communities* that are extending open-source principles to the physical production of vehicles, furniture, electronics and other things; and *citizen-science* that mobilizes massive participation in assessing environmental problems and orchestrating collaborative solutions.

In these collaborative worlds, people are self-consciously engaged in a process of *commoning* – the bottom-up coordination, disputation, negotiation, social practices and ethics needed to create functioning commons.<sup>4</sup> As social systems, these commons resemble, but go well beyond, the commons archetypes described by the late political scientist Elinor Ostrom, who won the Nobel Prize in Economics in 2009 for her pioneering studies of small-scale natural resource commons. The collaborative communities now emerging on digital platforms do not worry so much about resource-depletion or free riders – problems that affect the management of water, fisheries and land – as how to intelligently curate information from the multitudes and design effective self-governance structures for virtual collaboration.

The point of the commons paradigm, despite its many different flavors, is this: It provides “protected” space in which to re-imagine production and governance. As the motley universe of digital commons replicate and mutate, they have begun to federate and form new sorts of

transnational governance superstructures. It may not be perfectly accessible and democratic - thanks to the persistence of the “digital divide” (unequal access to computers, smartphones and the Internet) and the dominance of people with the discretionary time and energy to participate -- but this emergent realm of production and governance is far more accessible and transparent than conventional state democracy and more solidly grounded through bottom-up participation and ethical accountability.

It should be stressed that the commoning that takes place on open platforms is not confined to the nether regions of cyberspace; it also manifests itself in the “real world” of physical things, social practice and culture. Digital networks are becoming deeply entangled with all aspects of life, including our use of natural resources, the ways that we organize ourselves socially and economically, and in our very structures of knowledge, culture and identity. In this sense, our lives with digital technologies are profoundly affecting how we regard property, political life, and economic life.

The open-source governance that I will examine below must emphatically be distinguished from the faux-sharing models (i.e., micro-rental markets) that have been served up by Facebook, Google, Uber, Airbnb and other corporate “gig economy” players. Unlike these capital-driven enterprises, the collaborations that I am describing are fundamentally non-market and socially mindful in character. They are less defined by technology per se than by the new *social forms* and *political /cultural attitudes* that they engender. The salient innovations of the open design Farm Hack community, for example, or the open-source agronomy commons known as the System for Rice Intensification – both described below – are social in character. They want to make the world a better place without making return on investment the supreme priority. They want to move people beyond the producer/consumer dyad and formalistic notions of citizenship, and enable people to enact a more personal, DIY vision of self-provisioning and governance. (To be sure, the micro-rental “sharing” models may indirectly foster a cooperative ethic and “social capital,” and reduce the extent to which we build our identities on possessions and consumption, but they are still ultimately predicated on profit-making and competitive success in the market, which tend to erode the sinews of cooperative communities.<sup>5</sup>)

The work of digital commons scrambles the familiar categories of life that we normally pigeonhole as “the economy,” “government,” “law” and “civil society.” Digital commons amount to a new type of social organism that traverses all of these categories. Indeed, online collaborations virtually demand that we reconsider many of our epistemological and ontological assumptions about such dualisms as individual and collective, public and private, and objective and subjective. The commons blurs these categories.

### **The Limits of the Market/State**

Before describing the promising potential of digital commons in greater detail, it is important to briefly explain why existing configurations of the market/state are unlikely to deal with today’s challenges. Several interrelated deficiencies must be noted: the sheer global scale of market/state governance, its diminishing efficacy in dealing with local and global complexity, its

reliance on legal coercion without providing space for citizen consent and participation, and the growing sense of distrust and even illegitimacy associated with state actions.

One might say that techniques of rational governance, when applied to large-scale jurisdictions and augmented by bureaucracies and computer systems, have reached distinct limits. The command-and-control exercised by big bureaucracies, whether the U.S. Pentagon or Environmental Protection Agency on the one hand, or Microsoft or General Motors on the other, represents tremendous power, but it is also increasingly less effective in managing distributed, local complexity. Government agencies may enjoy strong statutory authority and plenty of sophisticated administrative tools. Corporate bureaucracies may have great capital resources and data analytics. Yet the knowledge gathered by these systems have become highly abstracted and quantitative, and their power profoundly anti-democratic and coercive. This can be seen, for example, in government use of Big Data to violate citizens' privacy and other civil liberties, and in corporations and law enforcement using data for racial and demographic profiling. Large-scale institutions tend to become focused on narrow, rigid metrics (Gross Domestic Product, short-term return on investment<sup>6</sup>) and their bureaucratic rules and credentials easily become tautologically closed and self-justifying.

In his 2014 book, *The Utopia of Rules*, anthropologist David Graeber, noted, "The most profound legacy of the dominance of bureaucratic forms of organization over the last two hundred years is that it has made the intuitive division between rational, technical means and the ultimately irrational ends to which they are put seem like common sense." The "rationality" of bureaucracy can easily become a convenient political and legal cover for state violence, corporate agendas, and "lawful dispossession." Graeber describes how the "alliance of government and finance often produces results that bear a striking resemblance to the worst excesses of bureaucratization in the Soviet Union or former colonial backwaters of the Global South."

If large bureaucracies are not responsive to local communities or politically disfavored groups, that is largely the (unstated) point: to provide a rational, systemic justification for the practices favored by the dominant political players. Bureaucracy is not a neutral, apolitical force. Once the fiction of bureaucratic rationality and procedure is widely accepted by the public, the system can be gamed to advance narrow, arbitrary ends. Politicians and bureaucrats can invoke "the law" as neutral, scientifically grounded and fair, but in practice implementation tilts to favor elites, shift costs to marginalized populations and shortchange the common good and future generations.

This is an apt summary of the capture of the regulatory state over the past fifty years. It is used to set important limits to market activity, but also to codify significant evasions. Representative democracy purports to address societal problems through the political process, but the "scientific" implementation is corrupted through half-hidden procedural subterfuges. The state acts as a crypto-partner in legalizing formerly unacceptable market behaviors.

The state, having cast its lot with capital accumulation and growth, is losing its credibility and competence in addressing larger needs. In her essay, "The Death of Democratic Governance," June Sekera writes that "marketization and its confederate, privatization, have led, sometimes intentionally, to the evisceration of governmental capacity, the downsizing of democracy and the

dismantling of traditions of responsible public administration that are grounded in law and the Constitution....With the rise of market-centrism and rational choice economics, government was devalued and allowed a role only in cases of ‘market failure.’ The very idea of a valid, valuable public non-market almost disappeared from sign. So today, we lack a coherent, comprehensive theory of the public economy.”<sup>7</sup> Indeed, standard economics today largely ignores the fundamental, affirmative role that government plays in facilitating functional, trustworthy markets.

As neoliberal policies have “hollowed out” government over the past generation, literally and conceptually, popular distrust of government has soared. And why not? Government has lost its actual capacities to serve many non-market social and ecological needs. As the Wall Street bailouts demonstrated, the state has been commandeered to serve the political interests of investors and corporations while imposing austerity on social services and protections for ordinary citizens. The state is further weakened by unrelenting ideological attacks on it as the enemy of freedom.

With waning public confidence in governance institutions at a low ebb, we have come to inhabit an “institutional void” of politics and policymaking, in the words of Dutch political scientist Maarten Hajer. “*There are no clear rules and norms according to which politics is to be conducted and policy measures are to be agreed upon. To be more precise, there are no generally accepted rules and norms according to which policy making and politics are to be conducted.*”<sup>8</sup> While the machinery of government continues to function, many of its deliberations amount to empty formalisms and politically staged propaganda.

Given this void and the barriers to democratic action, many citizens who might otherwise engage with legitimate state policymaking have shifted their energies into “transnational, polycentric networks of governance in which power is dispersed,” writes Hajer. This is seen in the emergence of new citizen-actors and new forms of mobilization” seeking system change – from cultural surges such as Occupy, the Arab Spring and Las Indignadas to long-term movements focused on degrowth, the solidarity economy, Transition Towns, peer production, the commons, and countless niche projects. In this new climate – the twilight of liberal democracy? – voting and other classical notions of citizenship often seem archaic and futile. Citizenship itself has become a diminished thing, even a vestigial formality. The system is rigged, as populist insurgents on both the right and left assert – yet what is the alternative?

Thus the impasse we face today: The neoliberal market/state agenda is inflicting grievous harm on the planet, social well-being and democracy – yet the market/state remains largely unresponsive to popular demands for change. Its power is seemingly secure, but its actual governance capacities are limited. Many NGOs and movements persist in “working within the system,” gamely believing that it might deliver meaningful change. Massive crowds of protestors at the same time argue persuasively that “the system is the problem,” yet few offer serious alternatives for remaking the bureaucratic market/state. Is there a way out of this conundrum?

## The (Still-Emerging) Promise of Open Source Governance

To say that commons based on open tech platforms will play a central role in transforming our politics and polity is not merely an optimistic assertion. It is already happening. The Internet and mobile telephony are becoming ubiquitous, and not just in the global North. Smartphones, e-tablets, laptops and countless other portable computing devices are proliferating, with most of them connected to the Internet via pervasive wifi and telephony. Businesses and markets are reconfiguring themselves to take advantage of electronic networks, which are increasingly global in scope. Electronic networks are now a defining infrastructure shaping the conduct of political life, governance, commerce and culture.

To be sure, many legacy institutions and social practices continue to exist. But they have no choice but to evolve. Familiar hierarchical, centralized systems of control such as the corporation, bureaucracy, institutional philanthropy and the nonprofit are under siege. Open networks are undercutting the enormous overhead costs that conventional institutions and markets tend to require – physical buildings, talent recruitment and retention, legal contracts, liability costs, marketing and branding, debt payments, and so on. By contrast, online commons are lightweight social systems that, with the right software and norms, can run quite efficiently on trust, reciprocity and modest governance structures.

Digital commons are materializing in part because it is easier and more socially satisfying to participate in a commons (especially when the marginal cost of information is virtually nil) than to pay for goods and services in the marketplace. This is posing something of a crisis for capitalism, argues Jeremy Rifkin in his 2014 book *The Zero Marginal Cost Society*. Rifkin notes that the extreme productivity of digital technologies is lowering the marginal costs of production for many goods and services to near zero. This is undercutting the premises of conventional markets, which are based on private owners using proprietary means to extract profits from nature, communities and consumers. But if those profits are increasingly squeezed by open, shared knowledge and technologies, then the foundations of capitalism as we know it today are imperiled. Rifkin declares:

We are glimpsing at the outlines of a new economic system based on sharing and the collaborative commons. It is the first new paradigm-shifting system since the introduction of capitalism and communism. Granted, it is still muddy and hazy but it is already flourishing alongside the exchange economy of the capitalist market. The dividing lines are not always clear because capitalist companies like Google or Facebook are actually creating commons. They make money out of it but these commons are then used by the people to drive out other companies or industries. And for every Google there is a Wikipedia, which is a non-profit commons. These two systems are still largely intertwined. But by mid-century, the new system will be the predominant one.<sup>9</sup>

The “collaborative commons” that Rifkin describes is a hybrid capitalist/commons economy that is able to exploit the efficiencies and higher quality produced on open networks. This in turn is giving rise to new infrastructures such as the “Internet of Things” (physical objects whose identity and

functions are linked to networks) and to new types of markets and commons. The producer/consumer dichotomy is giving way to “prosumers” (or commoners) who are able to create their own goods and services, without businesses as intermediaries. Hence the colossal “disintermediation” of the old economy. The venerable Encyclopedia Britannica succumbs to the power of Wikipedia, newspaper classified ads are supplanted by Craigslist, Netflix becomes the largest distributor of films without owning any theaters, Airbnb becomes the largest lodging business without owning any hotels, and Uber becomes the largest taxi service without owning any cars.

The dominant newcomers are capitalist enterprises, of course. Their use of open platforms amounts to “communism for capital,” as Michel Bauwens has pointed out. They freely privatize and monetize the fruits of social sharing, and in this sense, open platforms are “free” only within the boundaries allowed by business models and at the cost of digital commoners. Open platforms provide many valuable services at no (monetary) cost to users. But when some good or service is offered for at no cost, it really means that the user is the product: our personal data, attention, social attitudes lifestyle behavior, and even our digital identities, are the commodity that platform owners are seeking to “own.”

### **From Open Platforms to Digital Commons**

To combat corporate exploitation of open platforms, many efforts are now afoot to establish digital commons as viable alternatives. The new models are sometimes called “platform co-operativism.”<sup>10</sup> The point is to devise technical, organizational and financial forms that enable users to mutualize the benefits of their own online sharing, rather than allowing companies to siphon away collectively created value. In digital commons, the community asserts its sovereignty over markets and capital, and resists the surrender of personal information and digital identity to third parties.

The quest to convert open platforms into digital commons may seem marginal or quixotic, but in fact there are powerful economic dynamics driving this shift. Network analyst David P. Reed showed in a seminal 1999 paper<sup>11</sup> that the value generated by networks increases exponentially as interactions move from a *broadcasting* model based on “best content” (in which value is described by  $n$ , the number of viewers), to a network of *peer-to-peer transactions* (where the network’s value is based on “most members” and mathematically described by  $n^2$ ). But by far the most valuable networks are those that *facilitate group affiliations* to pursue shared goals – or what I would call commons.

Reed calculated that the value of “group forming networks,” in which people have the tools for “free and responsible association for common purposes,” to be  $2^n$  – a fantastically large number. His analysis suggests that the value generated by Facebook, Twitter, and other proprietary network platforms remain highly rudimentary because participants have only limited tools for developing trust and confidence in each other. Open source tools and principles could unleash this value – but it would subvert the business model. Social media companies must therefore deliberately stifle the actual value potential of the commons.<sup>12</sup>

Beyond network economics, there are powerful social forces propelling digital commons forward. A great many activists and social movements realize that existing governance structures and political parties are fundamentally unwilling to seek systemic change. Incumbent organizations and processes are too dominated by entrenched interests. Even legislative or regulatory victories are often Pyrrhic when followed by protracted litigation or weak bureaucratic implementation.

Hence the burgeoning interest among post-political, network-native activists (let us call them) in inventing new types of tech platforms that can challenge, bypass or disrupt “the system.” I chronicled the rise of these “digital commoners” in my 2008 book *Viral Spiral*, which traced the evolution of free and open source software, Creative Commons-licensed content, the remix and mashup worlds, open access scholarly publishing, the open educational resources movement, open data and open science projects, and other efforts to use open platforms and protocols for the common good.<sup>13</sup> This “viral spiral” of commoning has only intensified in the past decade, with the robust development of open design and manufacturing communities on a global scale, alternative digital currencies, open source mapping projects, crowdfunding to finance commons-based projects, and much else.<sup>14</sup>

I must stress: These are not just Silicon Valley startups with a dollop of social marketing. They are part of a worldwide cohort of “hacktivists,” makers, software programmers and social media innovators who are consciously attempting to build tech platforms that can meet needs in post-capitalist ways, often via commons. That is to say, the goal is to enable communities to reap the value that they generate. Participants contribute their talents and resources to the commons, and share in self-governance and entitlements.

Such open, participatory forms represent a serious advance over both market and state bureaucracy. Because transparency is the default norm in decision-making, merit and innovation tend to prevail over political connections and patronage. Unlike bureaucratic programs, whose deficiencies are often masked by their complexity or political sponsors, open source governance invites wide-open scrutiny, testing and improvement. Property rights and wealth are not prerequisites to participation. This means that solutions can draw upon a greater diversity of ideas and iterate more efficiently than hierarchical systems. The technological, economic and cultural possibilities are highly plastic. Preferred solutions are low-cost, modular and adaptable, not proprietary models designed to maximize private business revenues. Anyone can step up and contribute, and even self-organize one’s own consequential community of amateurs. And yet this world is not necessarily hostile to market activity; it simply privileges long-term community interests and mutualism over the money-making imperatives of capital.

Of course, these are the normative principles driving open source models. Actual implementation varies based on any number of factors – the importance of the project, the quality of its core maintainers, the direct or in-kind support of interested commercial interests, and so on. Not everyone can afford to volunteer or participate for minimal pay. Gender and racial diversity remains a serious problem, at least in the commercial tech world. Still, the vision of open source governance continues to animate many venturesome, idealistic minds because it offers genuine opportunities to make a difference.<sup>15</sup> Individual initiative and collective interests can be aligned

without the expense or exploitation of markets. While there may be a libertarian bent in many open source communities, those digital commons that succeed realize that active governance is very much needed to protect collective interests.<sup>16</sup>

### **Digital Commons as a New Species of Production and Governance**

To return to our original question: How can we develop new ways to preserve and extend the democratic capacities of ordinary people and rein in unaccountable market/state power? There is enormous practical potential in developing a Commons Sector as a quasi-independent source of production and governance. Simply by withdrawing from the dominant market system and establishing stable, productive alternatives – in the style of Linux, local food systems and the blogosphere – the regnant system can be jolted. While many digital commons may initially seem marginal, they can often “out-cooperate” conventional capital and markets with their innovative approaches, trustworthiness and moral authority. The output of digital commons is mostly for use value, not exchange value. It is considered inalienable and inappropriable, and must be shared and copied in common, not reflexively privatized and sold. By enacting a very different, post-capitalist logic and ethos, many “digital republics” are decisively breaking with the logic of the dominant market system; they are not simply replicating it in new forms (as, for example, the “sharing economy” often is).

Let us conspicuously note that not all open source systems are transformative. We see how existing capitalist enterprises have successfully embraced and partially coopted the transformative potential of open source software. That said, there are new governance innovations that hold lessons for moving beyond strict market and state control. For example, the foundations associated with various open source software development communities,<sup>17</sup> and the wide variety of “Government 2.0” models that are using networked participation to improve government decision-making and services (e.g., the Intellipedia wiki used by US intelligence agencies; Peer to Patent crowdsourcing of “prior art” for patent applications).

Any serious transformational change must therefore empower ordinary people and help build new sorts of collaborative structures. Ultimately, this means we must recognize the practical limits of external coercion and try to develop new systems that can enable greater democratic participation, personal agency, and open spaces for local self-determination and bottom-up innovation.<sup>18</sup> The examples described below are embryonic precursors of a different, better future.

#### **1. *New Vehicles for Group Deliberation and Governance***

Activists, techies and entrepreneurs are devising some fascinating new structures for group deliberation, self-provisioning, governance and finance. Most of these are far from the mainstream, but typically the future is incubated on the periphery. That is where Enspiral originated, a New Zealand-based (and now international) network of 300 people that describes itself as “a non-hierarchical distributed network of entrepreneurs, professionals and hackers who are using the tools of business and technology to make positive social change.”<sup>19</sup> Enspiral consists of many different small enterprises, social ventures and collaborative software tools.

One of its most significant projects is Loomio, an activist-driven tech cooperative that has developed an open source app for collaborative decisionmaking.<sup>20</sup> The idea for Loomio arose in 2011 when the Occupy movement in Wellington, New Zealand wanted to find a more scalable way to make inclusive group decisions. “We wanted to create a world where anyone, anywhere, can participate in decisions that affect them, and weave diverse perspectives into one, via collective wisdom,” said Benjamin Knight, cofounder of Loomio. The app provides “an online space for purpose-driven people to talk, build shared understanding and build creative courses of real-world action,” he said.

More than 80,000 people in 93 countries are now using this open-source software tool. It is being used by city councils and grocery cooperatives in India, and by Podemos in Spain and the Pirate Party in Greece. Hungarian student activists used the app to organize successfully against government funding cuts in education. The Sunflower movement in Taiwan used it to organize against secrecy in trade negotiations with the Chinese; the Taiwanese government later adopted Loomio to host collaborative decision-making with citizens.<sup>21</sup> Instead of making decisions through unstructured meetings in which the loudest voices, demographically large groups or people with lots of discretionary time can dominate the process – effectively excluding most others – Loomio provides a network-friendly system that blends the advantages of both top-down and bottom-up decision-making.

The Enspiral network – legally a limited liability corporation but functionally and culturally a coop – has spawned another fascinating app, Co-budget. This app allows Enspiral members to use a transparent democratic process to allocate money in the group account in proportion to how much each person has contributed to it. People can solicit support from group members asking them to fund specific “buckets” of expenditures – a software project, a convening, specific business expenditures, or anything else. The system also allows the transfer of money among its members, in effect functioning as a virtual banking system and a walled garden of autonomy, transparency and flexibility.

It’s noteworthy that this system is not just about money; it’s about building social trust within the community. One counterintuitive result of the co-budgeting process, said Alanna Krause of Enspiral, “is that it stops people from volunteering too much and burning out. A budget gives you social validation and a way to match people’s interests and output to what the system can fairly support.” Many Enspiral members see their platforms as powerful engines for building an alternative economy and society. Krause envisions Enspiral platforms evolving to handle peer-to-peer credit lines, crowdlending, basic income, and alternatives to taxes and interest.

Enspiral is but one example of an innovative organizational form, the “open value network,” or OVN, that is emerging. OVNs consist of digital platforms that facilitate new modes of open, decentralized and self-organized social governance, production and livelihoods. OVNs are organized in ways that let anyone to contribute to the project, and be rewarded based on their contributions, as measured by actual contributions, experience and other collectively determined criteria.<sup>22</sup> OVNs have been described as an “operating system for a new kind of organization” and

a “pilot project for the new economy.” Other fledgling OVN projects include Sensorica, the iAGRI innovation portfolio, Greener Acres, metamaps and Guerrilla Translation.<sup>23</sup>

Most commons tightly limit or prohibit the sale of their resources to markets except on stipulated terms, lest market ambitions begin to unravel collective commitments. Open value networks have no reservations about engaging with markets, but they do take active steps to maintain their organizational and cultural integrity as commons-based peer producers. This means that OVNs insist upon open, horizontal and large-scale cooperation and coordination so that everyone knows what is going on. Using systems like Co-budget, OVNs seek to democratically manage shared wealth and assets while allowing individual access, use, authorship and ownership of resources, consistent with group needs. OVNs use a careful accounting of individual “inputs and outcomes” via a common ledger system, and distribute rewards to participants based on their individual contributions to the project.<sup>24</sup>

OVN stress that while they may be legally nonprofits or for-profits, they are not functionally either, in that they have no retained earnings or fixed assets. They instead function as “a flow-through entity which is as formless as possible,” but which functions as a trust for its members, as outlined by a “nondominium” agreement.<sup>25</sup> While still fairly rudimentary, OVNs represent a fascinating new type of consensual governance/production regime, bound by contractual terms, that blends commons principles and market activity.

## **2. Eco-Digital Platforms at Small and Large Scales**

It is not widely appreciated how tech platforms can alter ecological stewardship and production practices in positive ways. To be sure ICTs (information and communications technologies) have many negative ecological impacts, at least as deployed by capitalist enterprises today – lots of electricity, rare earths, transport costs, pollution and planned obsolescence. But it is also true that these systems, when used in commons-based forms, could help usher in new, more ecologically benign forms of decentralized production and consumption. They can reorient people toward more cooperative, post-capitalist modes of life and culture while still hosting needed types of technological innovation.

One example is Farm Hack, a global design and manufacturing community that has applied open source development principles to agricultural equipment. To date, the Farm Hack network has produced designs for over 100 tools – an organic no-till roller, garlic planters, an “extinct” oat huller, greenhouse automation systems, sensor networks and business models for organic egg enterprises, among others. As Dorn Cox, a founding member of Farm Hack, writes: “Farm Hack is an emergent, networked culture of collaborative problem-solving.... Building on models of voluntary reciprocity, Farm Hack implicitly challenges the prevailing norms of conventional agricultural economics and research. The Farm Hack community believes that the tools, seeds and techniques used in agriculture should both reflect and benefit those who intend to use them, not just those intent on selling them.”<sup>26</sup>

Cox explains how the open, social collaboration of the Farm Hack community “creates the potential for every farm to become a research farm, and every neighbor to be a manufacturer, drawing upon

a global library of skills and designs.” The preindustrial and modern are conjoined through a marriage of agrarianism and maker/hacker ideals.

Another potent eco-digital commons is the international network of farmers who practice a kind of open-source agronomy for rice cultivation. The System for Rice Intensification, or SRI, is a vast network of thousands of farmers in Cuba, Sri Lanka, Indonesia and dozens of other countries who share their ideas for improving the yield of rice without the use of GMO seeds, pesticides or herbicides.<sup>27</sup> With the help of Cornell University, farmers collaborate through an online platform, [www.srice.org](http://www.srice.org), on which they share lectures, seminars, emails, publications and other materials, on an international scale. It is a bottom-up driven process without the sponsorship of government ministries or corporations. Even though SRI methodologies must be locally adapted, they are easy to understand and implement – and the impacts impressive. Crop yields are 20% to 50% more than conventional rice farming while using less seed, water and fewer chemical inputs. SRI is an example of how open-source collaborations, when applied to agricultural challenges, can yield practical, ecologically benign answers that do not even occur to commercial vendors and state authorities – perhaps because SRI is a commons-based system that is not profit-driven or hierarchically governed.

SRI is but one of many examples of agricultural crowdsourcing. Using network platforms to aggregate data and interpret them, farmers in diverse localities around the world can apply their own best judgment in selecting the most adaptive crops as the atmosphere becomes warmer.<sup>28</sup> A similar idea animates the Open Ag Data Alliance, which is trying to help farmers access and control the data about the crop yields, open source style, instead of agribusiness vendors owning and controlling that data through their own proprietary, non-interoperable platforms.<sup>29</sup> A data commons is a highly effective way for farmers to assess and improve their agricultural practices.

It helps to put these fledgling models into perspective: An estimated 2 billion people around the world depend upon commons of forests, fisheries, farmland, water, wild game and other natural resources for their everyday subsistence, according to the Alliance for Land. Such types of resource-governance are far more ecologically minded than global corporations whose “rip and run” extractivism is the norm. Yet introductory economics textbooks all but ignore these commons because they are for householding or subsistence, not market exchange, and thus are not regarded as interesting enough. If digital networks can empower local natural resource commons, and help them mutually support each other, as SRI and Farm Hack do, it would help elevate this “invisible commons sector” into great prominence.

The dynamics seen in SRI and Farm Hack are also playing out in many open design and manufacturing commons. Using open source principles on Web platforms, designers and practitioners are inventing and building low-cost hardware products such as modular automobiles, furniture and housing.<sup>30</sup> The goal is to design globally and build locally. Amateurs and artisanal entrepreneurs self-organize themselves into small-scale workshops known as Fab Labs, which function as managed commons of shared equipment and production using desktop manufacturing technologies such as 3D printers and CNC milling machines. The Fab Lab Network based at M.I.T., comprised of about 200 Fab Labs in more than 40 countries, describes itself as “an open,

creative community of fabricators, artists, scientists, engineers, educators, students, amateurs, professionals, ages 5 to 75+.”<sup>31</sup>

Here, as in other open source communities, there are commercial pressures to capitalize on the fruits of social collaboration without necessarily supporting it. There are libertarian factions in these spaces committed to “simplistic economic individualism and hypercapitalistic politics,” in the words of some critics.<sup>32</sup> Yet as mentioned earlier, there are also less-prominent forces committed to “platform cooperativism” and social justice within these frontier spaces. Part of the struggle going on in the maker movement is to enact this latter vision, so that its innovations and identity are not swallowed up by Google, Facebook, Apple and other tech giants. To date, these commons are showing an enormous capacity to democratize access to the tools for technical invention and build a (nonmarket) system of technical education, distributed research, and apprenticeship for the next generation.

This movement breathes the same air as “citizen-science,” a grassroots movement to crowdsource information for various scientific research projects. The efforts take many forms: counting birds and butterflies to assess migration patterns and biodiversity; classifying the size of craters on Mars for NASA; monitoring celestial phenomena to complement the tracking done by professionals; gathering field data about air and water quality. Open Source Beehives is an international collaboration of ecologists, beekeepers, makers and open source advocates who track the health of bee colonies (threatened by disease and chemicals) and promote their international recovery. Participants build their own 3D printable smart beehives and use Internet-connected sensors to compile data about bees, which project teams in Denver, Barcelona and Brussels use to develop solutions and policy proposals.

Conventional wisdom may dismiss these projects as too small and outlandish to be consequential. But as I describe below, the “replicate and federate” approach of so many digitally networked projects could yield a rapidly scaleable yet coordinated “social organism” of like-minded, locally adapted, constantly evolving commons.

### ***3. Blockchain Technology as an Instrument for Social Governance***

One of the most dramatic shifts in network-based governance is being driven by the “blockchain ledger,” the software innovation that lies at the heart of Bitcoin. Bitcoin itself was designed to serve familiar capitalist functions – tax avoidance, private capital accumulation and speculation. That said, the blockchain ledger is significant because it can be adapted for many other types of collective action on open networks beyond Bitcoin itself. The value of blockchain technology stems from its ability to validate the authenticity of a digital object (a bitcoin, a legal document, digital certificate, dataset, a vote or digital identity asserted by an individual) without the need for a third-party guarantor such as a bank or government body.

This solves a particularly difficult collective-action problem in an open network context: How do you know that a given digital object is the “real thing” and not a forgery? By using a searchable online “ledger” that keeps track of all transactions, blockchain technology solves this problem by acting as a kind of permanent record maintained by a vast distributed peer network. Because this

data is so large and dispersed among so many nodes in the network, it is far more secure than data kept at a centralized location, making it virtually impossible to counterfeit or corrupt.

Because of these capabilities, a recently released report suggests that blockchain technology could provide a critical infrastructure for building what are called “distributed collaborative organizations” (sometimes “distributed autonomous organizations”).<sup>33</sup> These are essentially self-organized online commons. By democratizing the ability of self-organized groups to authenticate digital identity (instead of having to rely on Facebook or Twitter, for example), commoners could use blockchain technology to allocate specified rights to its members, resulting in a new kind of distributed, self-governing organization. These rights, in turn, could be linked to the conventional legal system to make them legally cognizable and enforceable.

Here is a rudimentary example of how the blockchain might be used to build efficient, commons-based alternatives to conventional businesses. In the US, former Federal Communications Commission Chairman Reed Hundt has proposed using blockchain technology to create distributed networks of solar power on residential houses, coordinated as commons. The blockchain would keep track of how much energy a given homeowner generates and shares with others, and how much is consumed. In effect the system would enable the efficient organization of decentralized solar grids via a “green currency” that could serve as a medium of exchange within solar microgrids or networks, which in turn could help propel adoption of solar panels.<sup>34</sup>

The blockchain amounts to a network-based architecture for enabling commons-based governance. It could provide a rudimentary (or eventually sophisticated) framework for versatile forms of social exchange and collective governance. It would do this by serving as an accounting infrastructure for value-sharing among participants in a digital commons.<sup>35</sup> One potential application, for example, is smart contracts. These are dynamic software modules operating in an architecture of shared protocols, much like TCP/IP for the Internet or http for the World Wide Web. The protocols would be designed to let people assign standardized legal instructions to “smart” software agents on open networks.

Smart contracts would avoid the lengthy written documents that lawyers must write and review, and the “click-through” licenses used on websites and end-user licensing agreements for software. They would also avoid outside enforcement bodies such as courts. Instead, smart contracts would use modules of code to enter into and consummate “transactions” online, as authorized by individual users. The smart contracts could be used to structure any number of relationships in online milieus – new types of markets, for example, but also social commons in which “social currencies” that kept track of people’s contributions to the collective, their cumulative reputation or free-riding. While self-enforcing smart contracts could obviously facilitate market exchange, they could also facilitate nonmarket social exchange and group solidarity (by enframing gift exchange circuits, one-way philanthropy, indirect reciprocity, etc.).

While smart contracts are not yet operational, there are many serious projects and corporations attempting to use cryptocurrency principles to build an operational legal system based on self-executing code alone. One leading innovator is Ethereum, a project that is developing a blockchain “virtual machine” that can securely record and validate transactions.

## II. THE FUTURE OF NETWORK-BASED GOVERNANCE

The many innovations outlined above do not do away with the need for in-person contact and debate. They do not eliminate conflicts or politics. It is still important for deracinated moderns to connect to wisdom traditions and to the Earth. That said, new tech platforms are invaluable because they can open up new vistas for change. The politics of modern industrial societies (and even marginalized, rural countries) are locked in to a strict neoliberal vision of human development and extractive economics. Commons can introduce new modes of stewardship and social practice for managing natural resources, radically shifting ambitions from maximizing consumption and profit toward sustainability and meeting basic needs. Commons tap into vernacular knowledge and respond better to local needs and interests. They invite horizontal, inclusive participation. They make deliberations and transactions more transparent and thus more accountable.

In such an environment focused on practical outcomes, it is harder to indulge in ideological posturing and political spin. When open source principles prevail, countless inquiring eyes can scrutinize everything – the infrastructure, the transactions, the dialogues, the individuals – which minimizes the opportunities for quiet subterfuges and backroom deals. The processes of governance are more likely to be honest and fair, and be seen as such.

So why haven't open source systems – for software and beyond – supplanted the corporation and other capitalist forms over the past twenty years? One reason (beyond the libertarian outlook of many techies) is that free and open source software projects remain embedded in the traditional capitalist economy, which makes it hard for them to raise capital for collective nonprofit purposes, support livelihoods directly, and develop an alternative socio-economic vision. In the first burst of open source projects in the 1990s and early 200s, Silicon Valley capitalists managed to embrace, contain and profit from them. Today many hackers recognize the pathologies of the larger political economy, and are actively trying to neutralize them while building more independent new systems.

A first priority for the commons-minded hacker is to develop ingenious systems that can capture the value that a digital commons generates, so that it can be retained and recirculated by the community itself. Recent innovations in alternative currencies, such as the blockchain ledger, may help affinity groups do just that, providing an avenue for “commons value exchanges” that could partially emancipate participants from the conventional market economy and give them greater control over the code, information, creative works, goods and services they create.

Michel Bauwens of the P2P Foundation, and others, are trying to develop “commons-based reciprocity licenses,” generically known as CCRLs or CopyFair, to strike a middle ground between the full-sharing copyleft licenses (such as the GPL and Creative Commons NonCommercial license) and conventional copyright law, which make creative works strictly private. The idea is to introduce licenses requiring a basic reciprocity among users in a commercial context, so that the community that generates value can share in the gains. IBM, for example, would have to pay a licensing fee to use any code licensed under a CCRL. Without such a provision, companies often use open licenses to appropriate a community's code or creative works for free – while members of those communities struggle to earn a livelihood. Until ideas such as CCRL mature, open source

communities will remain creatures of *both* the market and commons – but ultimately subordinate to the capitalist economy.

Financial innovation to benefit the commons is therefore an urgent priority for moving open source governance to the next level. There are actually many initiatives afoot to develop this idea, as described in a recent report, “Democratic Money and Capital for the Commons,” produced by the Commons Strategies Group.<sup>36</sup> The report makes clear that credit and risk can be reconceptualized to serve the commons; it has been done before in various limited ways through public banks, social and ethical lending, and community development finance institutions. But there are also a number of innovative new models such as DIY credit systems, alternative currencies, tech-enabled mutual credit societies, and cooperative organizational models like Enspiral and OVNs. One might say that a post-capitalist vision for finance and money is fitfully emerging.

The ultimate goal of commons-based, mutualized finance is to develop provisioning systems that can blend the advantages of bottom-up innovation (inclusiveness, diversity, legitimacy) with the best of top-down decision-making (speed, decisiveness, scale). Commons that can achieve this sort of balance can avoid the disempowerment and exclusion often associated with top-down governance, while also avoiding the muddled responsibility and indecisiveness of unstructured decision-making.

As a nascent archetype of governance, online commons are attractive because they can host a flexible, ongoing process of iteration, self-improvement, and viral expansion. The imagination and goodwill of large numbers of people can be mobilized, without the cumbersome processes and legal formalities of conventional government. Finally, at a time when conventional political channels are dysfunctional because of ideological gridlock or single-party or dictatorial capture, digital commons provide rare, necessary open spaces for experimentation and innovation. New models can arise outside of the pathological force-fields of conventional politics, at least initially.

Of course, any of the scenarios sketched above require an open, nondiscriminatory Internet, or “net neutrality,” which in turn requires state action and laws. This is precisely what many authoritarian nation-states such as China, Saudi Arabia and others reject, and even many democracies such as the US, France and the UK insist upon extensive surveillance of the digital lives of their citizens. There is thus an unresolved tension between the state and open networks that may or may not stifle new possibilities for open source governance.

### **But Can Network Governance Scale?**

Another key question is: Can network governance scale? Given the urgency of finding quick-action solutions to climate change (among many other environmental crises), everyone tends to focus on global-scale, top-down solutions. The presumption is that only such an approach can achieve the scale, speed and efficacy needed. But the word “scale” is a term of hierarchical organization. If the networked environment provides any lessons, it is that top-down governance tends to over-administer and over-control processes, and in so doing, ignores important local

factors and knowledge. It also gives short shrift to the consent of the governed and dismisses the enormous benefits that can be had through the active, bottom-up participation of people.

That's why any lasting, effective solutions to climate change must be built on the small-scale projects that function as living systems, not bureaucratically directed modules. If each project can be self-organizing within a larger framework, it will not only mediate and reconcile the divergent interests of local and global concerns, it will build more seamless, functional systems for "scale linking" coordination. We can take instruction from life itself: The agency of a living organism derives from the coordinated work of many linked subsystems, each having their own capacities and scope of action. There is a certain autonomic capacity within living systems that, without explicit or formal instructions, self-generates and -organizes living systems.<sup>37</sup> Electronic networks function in much the same way, reflexively routing around barriers and dynamically self-organizing responses to needs as they arise. Digital commons functioning as networked systems will, in response to recognized needs, self-interconnect and coordinate themselves at all scales. These are properties of living, autocatalytic systems.

In trying to re-imagine "global governance," it is important that we not separate the local and regional from the global and transnational. These realms are not conceptually separate; they are deeply and functionally interconnected. Relying on hierarchical, mechanical systems of law and program administration are likely to fail, or at least not iterate and adapt rapidly enough to succeed. The best way to bring large-scale institutional and policy solutions into alignment with bottom-up energies and local knowledge is to *rely on smaller-scale needs and interests to propel the developmental emergence of higher forms of organization and governance*. Replicating small projects and then federating them via networks is more likely to expand them rapidly than centralized, hierarchical attempts to "scale" them.

In ecological terms, open networks often resemble "catchment areas" of a landscape in which numerous flows – water, vegetation, soil, organisms, etc. – come together and mutually give rise to an interdependent, self-replenishing catchment area: a lively, energy-rich zone.<sup>38</sup> Social change movements can emulate this dynamic as a way to foster emergence and system-change. As two students of complexity theory and social movements, Margaret Wheatley and Deborah Frieze, write:

When separate, local efforts connect with each other as networks, then strengthen as communities of practice, suddenly and surprisingly a new system emerges at a greater level of scale. This system of influence possesses qualities and capacities that were unknown in the individuals. It isn't that they were hidden; they simply don't exist until the system emerges. They are properties of the system, not the individual, but once there, individuals possess them. And the system that emerges always possesses greater power and influence than is possible through planned, incremental change. Emergence is how life creates radical change and takes things to scale.<sup>39</sup>

There is a rich literature in complexity theory and evolutionary science that has emerged over the past generation that validates the dynamics of bottom-up forms of social organization and

governance. Extensive empirical research confirms that some of the most stable, resilient forms of governance are distributed, self-organized and collaborative. This topic is explored at greater length in my book with Burns H. Weston, *Green Governance: Ecological Survival, Human Rights and the Law of the Commons*.<sup>40</sup> The basic point is that human communities can evolve higher, more complex forms of organization without the directive control of a central sovereign or bureaucracy. This phenomenon, often known as *emergence*, amounts to a bottom-up theory of governance for living systems.

Emergence is based on the idea that if a sufficiently defined and hospitable set of parameters and conditions is provided, stable forms of self-organization based on unique local circumstances can arise. This is what biological and chemical systems demonstrate all the time. Cells and other living systems have autocatalytic features that generate “order for free.” This insight from complexity sciences matches Professor Elinor Ostrom’s findings about countless self-organized commons: Effective governance need not be imposed from above through a comprehensive grid of uniform general rules, externally imposed. With the right “fitness conditions” (which may entail certain state-based law and infrastructure), governance can emerge naturally, on its own terms, through the active participation and consent of the governed at the relevant scale. This, indeed, is a recurrent phenomena seen in all living, evolving creatures. They *create* new spaces in which to flourish based on their contextual circumstances; that, arguably, is the mission of the human race right now.

The old guard of electoral politics and standard economics has trouble comprehending the principle of emergence (or catchment), let alone recognizing the value of policy structures that could leverage and focus that dynamic power. It has consistently underestimated the bottom-up innovation enabled by open source software; the speed and reliability of Wikipedia-style coordination and knowledge-aggregation; and the power of social media and open platforms. Politicians have been stunned by the swarms of protesters that rallied for “net neutrality” policies in the US, and by the viral self-organization of the Occupy movement, the Indignados and Podemos in Spain, and Syriza in Greece. Conventional schools of economics, politics and power do not comprehend the generative capacities of decentralized, self-organized networks.

But what if the state wanted to leverage the power of vernacular law by enabling digital commons? How could state law facilitate this sort of bottom-up emergence, subsidiarity and scale-linking coordination? What kind of polity do we need to foster this sort of commons-based governance?

### **Re-imagining Law for the Commons**

The challenge of moving beyond the existing polities of modern states can be summarized as the challenge of re-integrating *legality* with *legitimacy*, a chasm identified by French legal scholar Étienne Le Roy. We need a “law for the commons” that can bridge this gap between the formal strictures of state law and bureaucratic rules adopted by political and corporate elites – “legality” -- and the experiences and vernacular norms and practices of ordinary people. “Vernacular law,” as I call it, consists of the “unofficial” social norms, procedures, and customary institutions that peer communities devise to manage their own resources. Vernacular law has a moral and social legitimacy that commoners are struggling to assert, not just through law but through political

struggles and cultural expression.<sup>41</sup> Digital commons on open networks are important vehicles for asserting vernacular law, especially at a time when the neoliberal state wishes to suppress and deny dissenting agendas.

So how can this gap be bridged – or perhaps more accurately, evaded, hacked or finessed? This is a difficult challenge because state law is largely philosophically hostile to, or simply non-comprehending of, the very idea of commons and commoning. Civil law as administered by the state is focused on individual, private property rights and market exchange; it is structurally focused on “things” in isolation from dynamic social relationships, history, culture and ecosystems. The struggle to inscribe a “commons-based law” within the edifice of conventional state law is therefore an ambiguous or paradoxical challenge; some say it is impossible.<sup>42</sup> And yet it is absolutely needed because the nation-state is suffering a decline in legitimacy and efficacy as global capital becomes even more powerful, and as the scale and complexity of problems outstrip the capacity of corporate and governmental bureaucracies to solve them. Many people are starting to realize that the profound problems of modern life cannot be rectified by using the tools and mindset of modernity.

The physicist Fritjof Capra and law scholar Ugo Mattei recently shed light on this problem in their 2015 book, *The Ecology of Law*, which sees the history of law as an artifact of the scientific, mechanical worldview.<sup>43</sup> Capra and Mattei argue that we must transcend this legacy if we are to overcome many contemporary problems, particularly ecological disaster. They criticize modern state law because it privileges the individual as the principal agent despite the harm that this produces for the collective good and ecological stability. Law also presumes that the world can be governed by simplistic, observable cause-and-effect, mechanical relationships, ignoring the more subtle dimensions of life, especially the power of human subjectivity, caring and meaning.

Capra and Mattei note the important parallels between natural science and jurisprudence over the course of history. Both science and law, for example, reflect shared conceptualizations of humans and nature articulated by John Locke, Francis Bacon, Rene Descartes, Hugo Grotius and Thomas Hobbes. All of them saw a cosmological order that is rational, empirically knowable, and governed by atomistic individuals and mechanical principles. This worldview continues to prevail in economics, social sciences, public policy and law.

*The Ecology of Law* explains how this understanding of the world prevents us from effectively addressing our many ecological catastrophes, and how jurisprudence as now conceived is a key part of the problem. Modernity is based on the sanctity of private property and state sovereignty, write Capra and Mattei. It is an order that presumes to be an “objective,” natural representation of reality, and that regards distinctions such as “private” and “public,” and “individual” and “collective,” as self-evident descriptions of reality.

Any practicing commoner knows that this is a highly reductionist and misleading way of understanding the world. In actual experience, individuals are nested within collectives, and they develop and flourish as individuals only through cooperating with others. Similarly, subjective experience and objective fact are not isolated and separate; they blur together. The either/or divisions of modernity function as a kind of consensual social fiction, with law affirming and

enforcing these (misleading) categories of thought. For example, modern law presumes that if there is no external limit imposed on an individual citizen, each should be free to act as a “rational actor” to extract as much from nature as he/she wishes. This is presumed to improve upon nature, create value and advance human progress. In the modernist worldview that law embodies, individuals are imagined as the primary agents of change, and as isolated agents without history, social commitments or context. This gives individuals permission to be self-regarding and hedonistic in the face of collective and ecological needs – a capitalist-libertarian delusion that is celebrated and defended.

Imagining a post-capitalist future, then, is not simply about passing a new law or instituting a new set of policies. It requires that we confront our deep assumptions about worldview as embodied in law. What we need, Capra and Mattei argue, is a major paradigm shift in science and law that reflects a different understanding of nature and human beings. Instead of seeing the Earth and human societies as a machine of parts, we must see them as a holistic, indivisible ecological system: the world as a network of interdependencies. Law is not something that exists independently “out there” as an objective reality. It is a socially constructed order – a power that we must reclaim. “Law is always a process of commoning,” Capra and Mattei write, reminding us that law originates in social practice and norms; it emerges from communities of commoners.

This insight can help us imagine and build a new “ecolegal order” that has three strategic objectives, they argue: to disconnect law from power and violence (by reconfiguring the nation-state’s authority); to make communities sovereign (by empowering commons); and to make ownership generative (by integrating property rights with stewardship responsibilities). An eco-friendly legal order would recognize the holistic perspectives of commons in integrating costs and risks that market economies strive to externalize onto nature, communities and future generations.

### III. Re-imagining the Polity for a Networked Humanity

However promising the new forms of open source governance outlined above, they do not of themselves constitute a polity. The new regimes of collaboration constitute mini- and meso-systems of self-organization. They do not comprise a superstructure of law, policy, infrastructure and macro-support, which is also needed. So what might such a superstructure look like, and how might it be created? Can we envision some sort of transnational polity that could leapfrog over the poorly functioning state systems that prevail today?

A first observation on this question is that the very idea of a polity must evolve. So long as we remain tethered to the premises of the Westphalian nation-state system, with its strict notions of absolute sovereignty over geographic territory and people and its mechanical worldview enforced by bureaucracies and law, the larger needs of the Earth as a living ecosystem will suffer. So, too, will the basic creaturely needs of human beings, which are universal prepolitical ethical needs beyond national identity.

It may simply be premature to declare what a post-Westphalian polity ought to look like – but we certainly must orient ourselves in that direction. For the reasons cited above, we should find ways to encourage the growth of a Commons Sector, in both digital and non-virtual contexts, and in ways that traverse existing territorial political boundaries. Ecosystems are not confined by political borders, after all, and increasingly, neither are capital and commerce. Culture, too, is increasingly transnational. Any serious social or ecological reconstruction must be supported by making nation-state barriers more open to transnational collaboration if durable, effective solutions are to be developed. While states are usually quite jealous in protecting their authority, transnational commons should be seen as *helping* the beleaguered nation-state system by compensating for its deficiencies. By empowering ordinary people to take responsibility and reap entitlements as commoners, nation-states could foster an explosion of open-source problem-solving and diminish dependencies on volatile, often-predatory global markets, while bolstering their credibility and legitimacy as systems of power.

But how might we begin to build a commons-friendly polity? After all, the most politically attractive approaches have no ambitions to change the system, while any grand proposals for transforming neoliberal capitalism are seen as political non-starters. I suggest three “entry points” that can serve as long-term strategies for transformation: 1) begin to reconceptualize cities as commons; 2) reframe the “right to common” (access to basic resources for survival and dignity) as a human right; and 3) build new collaborations among system-critical social movements so that a critical mass of resistance and creative alternatives can emerge. These three general strategies are not separate approaches, of course, but highly complementary and synergistic.

#### 1. Cities as a Workshop for System-Change

One of the most promising places to start building a new polity is in cities. In Barcelona, Bologna, Seoul, and many other cities, citizen movements based on the ideas of “the city as a commons” and of “sharing cities” are taking root. Both approaches assert the shared interests of ordinary residents over those of the usual overlords of city government – real estate developers, economic

elites, “starchitects” and urban planners.<sup>44</sup> They recognize the city and its public spaces, communities and opportunities as products of commoning. A commons framing is deliberately invoked to make new moral and political claims on common resources in urban settings – and so inaugurate a self-feeding spiral of social practice and a new discourse. Citizens acting as commoners can insist on greater citizen participation not just in policymaking but in directly developing innovative projects and solutions. Network platforms can foster all of these goals.<sup>45</sup>

In Bologna, for example, the city government is undertaking a landmark reconceptualization of how government might work in cooperation with citizens. Ordinary people acting as commoners are invited to enter into a “co-design process” with the city to manage public spaces, urban green zones, abandoned buildings and other urban resources. The formal legal authority for this innovation, the Bologna Regulation for the Care and Regeneration of Urban Commons, is now being emulated by other Italian cities.

City governments could augment this general approach by building new tech infrastructures that enable greater citizen engagement. For example, instead of ceding the software infrastructure for taxi service or apartment rentals to Uber, Lyft, Airbnb and other well-financed “gig economy” corporations, city governments could require the use of shared open platforms for such market activity. This could enable multiple players to compete while improving regulatory oversight of basic labor and consumer protections, and privacy protection for personal data.

City governments could also take advantage of the new “Top Level Domains” – better known as TLDs – that are now available on the Internet for city names. TLDs are the regions of the Internet denoted by .com, .org and .edu. Over the past few years, the little-known Internet Corporation for Assigned Names and Numbers (ICANN) – which manages TLDs -- has been pushing the idea of TLDs for cities. The idea is that cities could use their unique TLDs like .rome or .paris to improve access to various aspects of city life. For instance if you were new to Brooklyn Heights, you could go to brooklynheights.nyc and find all sorts of civic, community and commercial website listings for that neighborhood – the library, recycling resources, parking rules, links to relevant city officials. And yes, the businesses.

City TLDs are a potentially transformative civil infrastructure that could be as consequential as the “street grid” layout of Manhattan adopted in the 1800s. Why should this enormous planning authority, which has such far-reaching implications for the life of a city, be auctioned off to private domain-name vendors, who would then re-sell “Brooklyn.nyc” and “hotels.nyc” to the highest bidder with minimal city oversight? It essentially cedes the future of a city to short-term commercial imperatives. TLDs should be treated as commons infrastructure and used to enhance neighborhood identities and bottom-up participation.

Network platforms are an especially attractive way to actualize the idea of “the city as commons” because they can enact all sorts of open source principles: low barriers to participation, transparency of process, bottom-up innovation, social pressure for fair dealing and resistance to concentrated power and insider deals.

One powerful way to advance commoning in cities is through the skillful use of open data. The ubiquity of computing devices in modern life is generating vast floods of data that, if managed cooperatively, could improve city life in many creative ways. Open data systems could be used to host participatory crowdsourcing, interactive collaborations among citizens and government, and improvements in municipal services (street repairs, trash removal, transportation).

The City of San Francisco recently used an open source model to explore how best to transform its busy Market Street thoroughfare into a more pedestrian-friendly, traffic-free promenade. To help ascertain what might appeal to ordinary city residents, the city issued an open call to artists for proposed street installations along a two-mile stretch of the boulevard. This elicited dozens of clever ideas – performance spaces, relaxation zones, even a six-sided ping pong table. City planners chose fifty of the projects for a real-world experiment over the course of three days in 2015 to see how people would actually engage with the artworks. The Market Street prototyping helped enlist a large and diverse group of the public to generate ideas that might otherwise seem too daring or unusual.

The City of Los Angeles has been another pioneer in using open networks, open data and crowdsourcing of information to improve city life. The city's open data portal, DataLA, offers data for everything from the city budget and the regional economy to crime locations, building inspections, property foreclosures, parking citations and even checks written by the city government. The data portal has helped people measure the effectiveness of government and build public trust in government. It has also been used in creative ways to solicit people's knowledge in providing "geo-references" to historic photos. The HistoricPlacesLA project has been described as an "open-source, web-based, geospatial information system for cultural heritage inventory and management."<sup>46</sup> The City has also created a special smartphone app, PulsePoint, which can help deal with medical emergencies anywhere in the city. It identifies a patient's location and any CPR-trained individuals who may be nearby, while providing CPR guidance. The app suggests a way that cities could use smartphones to coordinate needs with responses instantly: a versatile model for the future.

Using smartphones to crowdsource real-time data is another way that a city could use commoning to reinvent the role of government. The City of Los Angeles' fascinating (non-financial, non-exclusive) collaboration with Waze, a Google-owned traffic and navigation smartphone app offers several lessons. The system is used by an estimated 30 percent of Los Angeles drivers to learn about traffic accidents and other road situations, and its massive usage has made it a de facto infrastructure tool for city transportation and data managers. The City gives Waze timely data about active road construction projects in order to alert drivers about potential or actual traffic delays – and Waze, for its part, collects crowdsourced reports about traffic and sends them to city transportation officials every two minutes. (There is no collection of any personally identifiable information.) Even though this is a public/private partnership – not a true commons – it suggests the great power of bottom-up sharing on network platforms. Of course, such data aggregation is no substitute for real investment in the physical commons of transport infrastructure and public space, but used wisely it could facilitate more citizen focused improvements.

City governments (or state or federal governments, for that matter) could leverage bottom-up, interactive collaborations such as these by developing their own open APIs [application programming interfaces] on electronic networks – similar to those used by the iPhone and other platforms. This would enable governments to collect real-time data and make more dynamic, responsive choices “in cooperation” with its citizens. City governments could also perform automatic oversight of regulated entities without the complexities of conventional regulation. Sensors for water or air quality, for example, could provide real-time data portraits of an airshed or watershed. By using tamper-proof data-flows from remote devices, some of the expense of in-person inspections could be avoided and the quality of enforcement improved.

The huge potential of open data networks raises important questions about governance structures, however. How should crowdsourced information be managed and governed – by proprietary companies? City governments? Citizens as commoners? As the controversial growth of Uber and Airbnb has shown, there are great risks in such power being held by a few large tech companies answerable primarily to investors. Yet very few city governments have shown leadership in using networked systems to advance public designs for public purposes. There is a need to set forth some commons-based governance alternatives because they are the most likely to align civic needs and realities with the ultimate policies and decisions.

Fortunately, there are a number of pacesetter projects experimenting along these lines. In addition to the Bologna Regulation mentioned above, the European Cultural Foundation is actively exploring the role that artistic and cultural commons can play in improving cities. The Ubiquitous Commons project is developing a prototype legal/technological toolkit to empower people to control the personal data they generate from countless devices, especially in urban contexts. The Open Referral Initiatives is developing a common technical language so that information systems can “speak” to each other and share community resource directory data. The beauty of these and other initiatives is that they invite broad participation and address immediate, practical needs while contributing to a very different paradigm of governance – one that fosters commons and commoning.

## **2. The Right to Common as a Basic Human Right**

The “right to the city” asserted by commoners is essentially a human right – a moral and political claim of access to resources that are essential to life, and to a right to participate in their use and management. So it is worth situating this entire struggle in the context of human rights law and social movements. The goals of commoning and human rights law have, in fact, a very long, entangled history. They go back at least 800 years, when King John adopted the Magna Carta and its lesser-known companion document, the Charter of the Forest, as a way to settle a bitter civil war. The Charter of the Forest (later incorporated into the Magna Carta) recognizes the claims of commoners to the common wealth that belongs to them as human beings, and who depend upon certain resources for their everyday subsistence.

For example, the Magna Carta formally recognized in writing the right of commoners to access and use forests that the King had previously claimed as his alone. It helps to remember that commoners in the thirteenth century relied on forests for nearly everything – wood to cook their

food and build their houses, wild game to eat, plants to feed their cattle, acorns to fatten their pigs. The problem is that their long-standing *customary use* of the forest and other common resources was not *legally recognized* – and so the King and his lords could (and did) arbitrarily ignore the moral and human rights of commoners. The Magna Carta was a frank acknowledgment that commoners indeed have human rights – the right to use the forest, the right to self-organize their own governance rules, and civil liberties and rights to protect them from the sovereign’s arbitrary abuses of power.<sup>47</sup>

There are other strands in this legal history of human rights and commons that are too involved to discuss here; my co-author Burns H. Weston, an international human rights and law scholar, and I explore them more fully in our book *Green Governance*. Suffice it to say that it is entirely consistent with human rights law for it to squarely embrace the right of universal access to clean air, water, food and other resources and ecosystems that are essential to life.

The problem is that human rights champions have historically sought to fulfill these rights within the prevailing system of law and commerce, i.e., the neoliberal state and markets. But given its commitments to individual property rights, “free markets” and economic growth, it should not be surprising that the actual vindication of human rights is a problematic affair. The idea of human rights has been aspirational, frequently stymied by hostile structures of the state, law and commerce. Surely it is an apt moment to consider how various types of common-based governance (as described above) could actualize human rights in more robust, stable ways.

To try to advance human rights law in such directions, Weston and I in 2013 proposed a Universal Covenant Affirming a Human Right to Commons- and Rights-based Governance of Earth’s Natural Wealth and Resources.<sup>48</sup> It is our attempt to win recognition for the human right to “green governance” – to manage resources as commons, and thus to actualize human rights more reliably than existing systems of national and international law now do. A related effort should be the “reinvention of law for the commons,” a topic that I addressed in a 2015 research memorandum.<sup>49</sup> The paper calls for a new field of inquiry and legal innovation -- commons-based law – to consolidate the disparate areas of law that are trying to protect collective resources and practices from enclosures while providing affirmative legal support for people to enter into commoning.

### **3. Building a Convergence of System-Critical Movements**

The third strategic approach I want to suggest for building a new polity supportive of the commons is through an ongoing convergence and alignment of diverse system-critical social movements. The failures of neoliberal capitalism are coming at the very time that promising new modes of production, governance and social practice are exploding, especially through decentralized, self-organized initiatives on open networks that can often out-perform both the market and state.<sup>50</sup> The people developing these new systems are essentially creating a new parallel economy – sometimes by choice, sometimes by necessity, as in Greece and Spain. The innovators are not politicians, CEOs or credentialed experts, but ordinary people acting as householders, makers, hackers, permaculturists, citizen-scientists, cooperativists, community foresters, subsistence

collectives, social mutualists and commoners: a vast grassroots cohort whose generative activities are not really conveyed by the term “citizen” or “consumer.”

Through network-based cooperation and localized grassroots projects, millions of people around the world are managing all sorts of bottom-up, self-provisioning systems. There are also many new types of citizen-actors and mobilizations seeking system change, ranging from cultural surges such as Occupy, the Arab Spring and the Las Indignadas to more durable long-term movements focused on cooperatives, degrowth, the solidarity economy, Transition Towns, relocalized economies, peer production, and the commons. These movements are developing new visions of “development” and “progress,” as seen in the *buen vivir* ethic in Latin America, for example, or in “go local” movements in the US and Europe, and the FabLabs and makerspaces. The new models also include alternative currencies, co-operative finance and crowdequity investments to reclaim local control, transition and indigenous peoples’ initiatives to develop sustainable post-growth economies, the movement to reclaim the city as a commons, and movements to integrate social justice and inclusive ethical commitments into economic life. These movements are not only pioneering new types of collective action and provisioning, but also new legal and organizational forms. The idea of “generative ownership” as a collective enterprise is being explored by leaders of co-operative finance, community land trusts, relocalized food systems and commons-based peer production. Each is attempting to demonstrate the feasibility of various commons-based ownership structures and self-governance – and then to expand the use of such models to show that there *are* attractive alternatives that can mature into a new economic ecosystem.

The general approach here is to change the old by building the new. The demonstration of feasible alternatives (renewable energy, cooperativism, relocalization, etc.) is a way to shift political momentum, constitute new constituencies for system change, and assert a new moral center of gravity. To work, however, the alternatives incubated *outside* the existing system must achieve a sufficient coherence, intelligibility, scale and functionality.

The commons can act as a shared meta-language among these highly diverse groups because the commons expresses many of the core values and priorities of many “system-change” movements. Like DNA, which is under-specified so that it can adapt to local circumstances, the commons discourse is general enough to accommodate myriad manifestations of basic values and principles. More than an intellectual framework, the commons helps make culturally legible the many social practices (“commoning”) that are often taken to be too small and inconsequential to matter – but which, taken together, constitute a different type of economy. In this fashion, the commons discourse itself has an integrative and catalytic potential to build a new type of networked polity. Michel Bauwens, Founder of the P2P Foundation, and his colleague John Restakis argue that the state can be reinvented as a “Partner State” in support of commons and peer production:

One the one hand, market competition will be balanced by cooperation, the invisible hand will be combined with a visible handshake. On the other hand, the state is no longer the sovereignty authority. It becomes just one participant among others in the pluralistic guidance systems and contributes its own distinctive resources to the

negotiation process ... official apparatuses remain at best first among equals. The state's involvement would become less hierarchical, less centralized and less directive in character. The exchange of information and moral suasion become key sources of legitimation and the state's influence depends as much on its role as a prime source and mediator of collective intelligence as on its command over economic resources or legitimate coercion.<sup>51</sup>

The idea of the partner state is intriguing, but will require further theoretical elaboration and investigations in how it might be politically actualized. One serious attempt at this in the context of digital commons is the Commons Transition Plan prepared by Bauwens in conjunction with a research project sponsored by the Government of Ecuador in 2014.<sup>52</sup> It attempts to envision state policies that could help bring about "a society and economy that functions as common pools of shared knowledge in every domain of social activity."

## Conclusion

A new polity is not something that can simply be declared or imposed. It must be co-enacted over time. We must co-evolve into it by living as commoners. It is therefore difficult to project what a new polity might look like today; too many developmental realities must occur. It will be emergent, which is to say, it will manifest a different structural logic and organization than we presume is possible today. Standing at the base of a never-ascended mountain, we cannot really know which path to take and what the view from the peak will look like.

In the meantime, it is clear that the nation-state as a governance regime is facing serious new pressures. It exists in a highly interconnected world in which transboundary interactions are extensive and routine. Transborder flows are not just commercial in nature, but also involve transfers of ideas, values, projects, policy initiatives, and visions for humanity. As the peer-to-peer velocity of cross-border exchange reaches new intensities, the nation-state and international treaty systems will face new insurgent pressures from below. How could it be otherwise? The question is whether the needs of people at the micro, everyday level can be brought into closer alignment with the conduct of macro-institutions.

The Internet and digital technologies are certainly bringing this issue to a head as they catalyze and organize new sorts of bottom-up political and cultural energies. It remains unclear whether those energies will fracture the old polity and its governance systems, and give rise to a new commons-based techno-economic social paradigm and polity – or whether the Googles and Facebooks of the world, and their corporate brethren, will succeed in reinventing capitalism in the age of electronic networks, assuring their ongoing mastery, perhaps in more ominous, unequal and coercive forms.

I do believe that fostering the social practices and norms of commoning may be one of the few pathways to develop transformational change. It offers many points of access for participation. It energizes bottom-up pressures and innovation from the edge. It can generate goods and services to meet real needs outside of capitalist structures, or through more benign localized market hybrids and systems of mutualized support. It provides a flexible, evolving template for change that works in diverse contexts and yet it articulates a core set of principles with a post-capitalist logic.

We have lived as vassals within the massive market/state edifice and its cultural matrix for so long that it somehow surprises us to have the airline pilot come on the intercom and announce that we're all in this together, and that our agency as individuals acting collectively will be the only way to secure our future. It is entirely appropriate, then, that we turn to our neighbors on either side of us, introduce ourselves, and begin the formidable task of reinventing new types of commons. In the process, the eventual inter-networking of commons will give birth to an emergent global polity whose dimensions cannot be fully imagined today but which aspires to emancipate humanity from the limitations of modernity. The commons is no magic talisman, nor a panacea. Nor are network platforms. But they do enable us to rediscover that sovereignty does not ultimately reside in the state or market (especially in these times), but within ourselves, together.

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- <sup>1</sup> David Bollier is an independent author, activist and scholar who studies the commons as a new paradigm of economics, politics and culture. He is cofounder of the Commons Strategies Group and blogs at [Bollier.org](http://Bollier.org), and lives in Amherst, Massachusetts, in the US.
- <sup>2</sup> David Remnick, “Many Voices, *The New Yorker*, October 15, 2001, pp. 53-54.
- <sup>3</sup> Rifkin, Benkler, Tapscott, Bauwens, Paul Mason
- <sup>4</sup> The idea of patterns of commoning – the commons as a verb, not just a noun – are explored in David Bollier and Silke Helfrich, *Patterns of Commoning* (Commons Strategies Group, 2015), at <http://www.patternsofcommoning.org>.
- <sup>5</sup> For a discussion of the potential and limits of the “sharing economy” in cities, see Julian Agyeman et al [https://www.foe.co.uk/sites/default/files/downloads/avgeman\\_sharing\\_cities.pdf](https://www.foe.co.uk/sites/default/files/downloads/avgeman_sharing_cities.pdf); and on the importance of reducing our reliance on consumption for identity see Armstrong and Jackson <https://www.foe.co.uk/sites/default/files/downloads/mindful-consumer-mindfulness-training-escape-from-consumerism-88038.pdf>
- <sup>6</sup> For a longer discussion of the shortcomings of current economic and business models for the Big Ideas project see <https://www.foe.co.uk/sites/default/files/downloads/focusing-business-doing-good-74823.pdf>
- <sup>7</sup> June Sekera, “Economics and the Near-Death Experience of Democratic Governance,” Global Development and Environment Institute Working Paper No. 15-02, Tufts University, May 2015, available at <http://www.ase.tufts.edu/gdae/Pubs/wp/15-02SekeraEconomicsDe-Democratization.pdf>.
- <sup>8</sup> Maarten Hajer, “Policy without Polity? Policy Analysis and the Institutional Void,” 36 *Policy Science* 175 (2003) – emphasis in the original.
- <sup>9</sup> Jeremy Rifkin, interview with Lars Mensel and Max Tholl, *The World Post*, March 2, 2015, at [http://www.huffingtonpost.com/2015/03/02/rifkin-new-economy-social-skills\\_n\\_6777646.html](http://www.huffingtonpost.com/2015/03/02/rifkin-new-economy-social-skills_n_6777646.html)
- <sup>10</sup> A major conference, Platform Co-operativism,” was held at the New School in New York City on November 13-14, 2015. More at <http://platformcoop.net>.
- <sup>11</sup> David P. Reed, “That Sneaky Exponential – Beyond Metcalfe’s Law to the Power of Community Building,” at <http://www.reed.com/dpr/gfn/reedslaw.html>.
- <sup>12</sup> See David Bollier and John H. Clippinger, “The Next Great Internet Disruption: Authority and Governance,” in Clippinger and Bollier, *From Bitcoin to Burning Man and Beyond: The Quest for Identity and Autonomy in a Digital Society* (ID3 and Off the Commons Books, 2014), pp. 21-28, at <https://idcubed.org/chapter-3-next-great-internet-disruption-authority-governance>.
- <sup>13</sup> David Bollier, *Viral Spiral: How the Commoners Built a Digital Republic of Their Own* (New Press, 2008).
- <sup>14</sup> For essays on these topics, see David Bollier and Silke Helfrich, *Patterns of Commoning* (Commons Strategies Group, 2015).
- <sup>15</sup> See, e.g., Christopher M. Kelty, *Two Bits: The Cultural Significance of Free Software* (Duke University Press, 2008).
- <sup>16</sup> A noteworthy example is how the Burning Man festival, a “pop-up city” of 60,000 people, transformed itself from an ethos of libertarian license to a cooperative, self-governing community of individualists. See Peter Hirshberg, “Burning Man: The Pop-Up City of Self-Governing Individualists,” in Clippinger and Bollier, *From Bitcoin to Burning Man and Beyond* (ID3 and Off the Common Books, 2014), at <https://idcubed.org/chapter-5-burning-man-pop-city-self-governing-individualists>.
- <sup>17</sup> <https://opensource.com/resources/organizations>
- <sup>18</sup> For a longer discussion of grassroots and social innovation for the Big Ideas project, see [https://www.foe.co.uk/sites/default/files/downloads/big\\_ideas\\_innovation](https://www.foe.co.uk/sites/default/files/downloads/big_ideas_innovation).
- <sup>19</sup> The text in this section is adapted from a report by David Bollier and Pat Conaty, *Democratic Money and Capital for the Commons: Strategies for Transforming Neoliberal Finance Through Commons-Based Alternatives* (Commons Strategies Group and Heinrich Boell Foundation, 2015).
- <sup>20</sup> <https://en.wikipedia.org/wiki/Loomio>
- <sup>21</sup> Benjamin Knight talk, “Self-Organizing Community Democracy for the Internet Age,” Bioneers conference, November 12, 2015; video at <https://www.youtube.com/watch?v=AJnjTd9u4zg&feature=youtu.be>
- <sup>22</sup> For more, see the Value Network website, at [http://valuenetwork.referata.com/wiki/Main\\_Page](http://valuenetwork.referata.com/wiki/Main_Page).
- <sup>23</sup> [http://valuenetwork.referata.com/wiki/Main\\_Page](http://valuenetwork.referata.com/wiki/Main_Page)

<sup>24</sup> As described by the P2P Foundation, OVN's seek holoptism: "the ability for any member to have horizontal knowledge of what the others are doing, but also the vertical knowledge related to the aims of the project." It is the opposite of panoptism, which distributes knowledge via hierarchical organization and gives a full view only to those at the "top of the pyramid." <http://p2pfoundation.net/Holoptism>

<sup>25</sup> A new form of common property governed, in the words of Chris Cook, by "a consensual legal framework agreement within which value may be created, shared and exchanged (P2P) on credit terms by reference to a unit of account (note that a unit of account is NOT a currency)." See <http://p2pfoundation.net/Nondominium>.

<sup>26</sup> Dorn Cox, "Farm Hack: A Commons for Agricultural Innovation," in Bollier and Helfrich, *Patterns of Commoning* (Commons Strategies Group, 2015), pp. 145-150.

<sup>27</sup> Erika Styger, "The System of Rice Intensification and Its International Community of Practice," in Bollier and Helfrich, *Patterns of Commoning* (2015), pp. 108-112.

<sup>28</sup> Jacob van Etten, "Farmers Become Citizen Scientists: Testing Wheat Crops for Climate Change Adaptation," Research Program on Climate Change," <https://ccafs.cgiar.org/blog/testing-wheat-crops-climate-change-adaptation>.

<sup>29</sup> <http://openag.io/about-us>

<sup>30</sup> Tristan Copley Smith, "The Growth of Open Design and Production," in Bollier and Helfrich, *Patterns of Commoning*, pp. 154-158.

<sup>31</sup> <http://www.fabfoundation.org/about-us>.

<sup>32</sup> Jathan Sadowski and Paul Manson, "3-D Print Your Way to Freedom and Prosperity," *Al Jazeera*, May 17, 2014, at <http://america.aljazeera.com/opinions/2014/5/3d-printing-politics.html>.

<sup>33</sup> See the report, "Distributed Collaborative Organizations: Distributed Networks & Regulatory Frameworks," written by people associated with Swarm, the Berkman Center for Internet and Society, New York Law School and the MIT Media Lab, in March 2015, available at <http://bollier.org/distributed-networks-and-law>. See also Rachel O'Dwyer, "The Revolution Will (Not) Be Decentralized," Commons Transition website, June 11, 2015, at <http://commonstransition.org/the-revolution-will-not-be-decentralised-blockchains>; and Morgen E. Peck, "The Future of the Web Looks a Lot Like Bitcoin," *IEEE Spectrum*, July 1, 2015, at <http://spectrum.ieee.org/computing/networks/the-future-of-the-web-looks-a-lot-like-bitcoin>.

<sup>34</sup> Reed E. Hundt, Jeffrey Schub and Joseph R. Schottenfeld, "Green Coins: Using Digital Currency to Build the New Power Platform," in Clippinger and Bollier, *From Bitcoin to Burning Man and Beyond*, available at <https://idcubed.org/chapter-10-green-coins-using-digital-currency-build-new-power-platform>.

<sup>35</sup> For more on Bitcoin, see <http://p2pfoundation.net/Bitcoin>; <http://bollier.org/blog/blockchain-promising-new-infrastructure-online-commons>; and [http://www.nytimes.com/2015/03/02/business/dealbook/data-security-is-becoming-the-sparkle-in-bitcoin.html?\\_r=1](http://www.nytimes.com/2015/03/02/business/dealbook/data-security-is-becoming-the-sparkle-in-bitcoin.html?_r=1)

<sup>36</sup> <http://bollier.org/democratic-money-and-capital-commons-report-pdf>

<sup>37</sup> Andreas Weber, *Biology of Wonder: Aliveness, Feeling and the Metamorphosis of Science* (New Society Publishers, 2016).

<sup>38</sup> Joline Blais, "Indigenous Domains: Pilgrims, Permaculture and Perl," *Intelligent Agent* 6(2), 2006, at [http://www.intelligentagent.com/archive/Vol6\\_No2\\_community\\_domain\\_blais.htm](http://www.intelligentagent.com/archive/Vol6_No2_community_domain_blais.htm).

<sup>39</sup> Margaret Wheatley and Deborah Frieze, The Berkana Institute, "Using Emergence to Take Social Innovation to Scale," 2006, at [http://berkana.org/berkana\\_articles/lifecycle-of-emergence-using-emergence-to-take-social-innovation-to-scale](http://berkana.org/berkana_articles/lifecycle-of-emergence-using-emergence-to-take-social-innovation-to-scale).

<sup>40</sup> David Bollier and Burns H. Weston, *Green Governance: Ecological Survival, Human Rights and the Law of the Commons* (Cambridge University Press, 2013), pp. 112-130.

<sup>41</sup> The idea of vernacular law is developed in Burns H. Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights and the Law of the Commons* (Cambridge University Press, 2013), pp. 104-112.

<sup>42</sup> For example, Étienne Le Roy notes that the French civil code of 1804 broke with the old ideas of customary law, introducing new norms that quite deliberately do not recognize the social and resource-management practices of ancient commoners. This mismatch between contemporary law and commoning continues today, as seen in the juridical categories of international trade treaties, intellectual property laws, and other legal regimes dedicated to neoliberal market exchange.

<sup>43</sup> Fritjof Capra and Ugo Mattei, *The Ecology of Law: Toward a Legal System in Tune with Nature and Community* (Berrett-Koehler, 2015).

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<sup>44</sup> Sheila Foster and Christian Iaione, “The City as a Commons,” *Yale Law & Policy Review*, 34(2): 2016, at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2653084](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2653084); European Cultural Foundation and Krytyka Polityczna, *Build the City: Perspectives on Commons and Culture* (2015); and International Association for the Study of the Commons conference, “The City as a Commons: Reconceiving Urban Space, Common Goods and City Governance,” November 6-7, 2015, in Bologna, Italy, at <http://www.labgov.it/urbancommons>.

<sup>45</sup> For more on cities from the Big Ideas project see Agyeman et al on Sharing Cities [https://www.foe.co.uk/sites/default/files/downloads/agyeman\\_sharing\\_cities.pdf](https://www.foe.co.uk/sites/default/files/downloads/agyeman_sharing_cities.pdf); Scandrett on citizen participation [https://www.foe.co.uk/sites/default/files/downloads/citizen\\_participation\\_and.pdf](https://www.foe.co.uk/sites/default/files/downloads/citizen_participation_and.pdf); and Bulkeley et al on distributed autonomy [https://www.foe.co.uk/sites/default/files/downloads/autonomy\\_briefing.pdf](https://www.foe.co.uk/sites/default/files/downloads/autonomy_briefing.pdf)

<sup>46</sup> <http://www.historicplacesla.org>

<sup>47</sup> For more, see Peter Linebaugh, *The Magna Carta Manifesto: Liberty and Commons for All* (University of California Press, 2008).

<sup>48</sup> [http://commonslawproject.org/sites/default/files/clp\\_universal\\_covenant.pdf](http://commonslawproject.org/sites/default/files/clp_universal_covenant.pdf)

<sup>49</sup> David Bollier, “Reinventing Law for the Commons,” September 2015, available at <http://bollier.org/reinventing-law-commons-memo> and [http://wiki.commonstransition.org/wiki/Law\\_for\\_the\\_Commons](http://wiki.commonstransition.org/wiki/Law_for_the_Commons).

<sup>50</sup> Jeremy Rifkin, *The Zero Marginal Cost Society* (Palgrave Macmillan, 2014); Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (Yale University Press, 2006).

<sup>51</sup> Michel Bauwens, “Peer Governance as a Third Mode of Governance,” P2P Foundation, Jun 9, 2010, available at <http://blog.p2pfoundation.net/peer-governance-as-a-third-mode-of-governance/2010/06/09>.

<sup>52</sup> <http://commonstransition.org/a-commons-transition-plan>