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Jack Kloppenburg

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Re-purposing the master's tools: the open source seed initiative and the struggle for seed sovereignty

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'Food sovereignty' must necessarily encompass 'seed sovereignty'. Corporate appropriation of plant genetic resources, development of transgenic crops and the global imposition of intellectual property rights are now widely recognized as serious constraints on the free exchange of seeds and the development of new cultivars by farmers, public breeders and small seed companies. In response, an Open Source Seed Initiative (OSSI) has been launched in the United States to apply legal mechanisms drawn from the open source software movement to plant breeding. An open source license is a tool constituted by the provisions of contract law. It is a tool of the master inasmuch as the structure of the legal system has been designed to facilitate the activities of the dominant stakeholders in the overarching social formation. This paper assesses the problematics of re-purposing such a tool by examining the issues that have been raised in OSSI's efforts to develop its licenses and to transmit its sense of their potential to prospective allies. Through an examination of the expressed positions of La Vía Campesina and Navdanya on the nature of 'seed sovereignty', the compatibilities and disjunctures of OSSI's stance with those of potential allies in the food sovereignty movement are assessed.

Keywords: food sovereignty; seed sovereignty; genetic resources; plant breeding; seeds; intellectual property rights; open source

Introduction

For the master's tools will never dismantle the master's house. They may allow us to temporarily beat him at his own game, but they will never enable us to bring about genuine change.

–Audre Lorde (1984)

Open source is a development methodology. Free software is a social movement.

–Richard Stallman (2013)

Given the position of the seed as part of the irreducible core of agricultural production, it is difficult to imagine any form of 'food sovereignty' that does not include a necessary and concomitant dimension of what might be called 'seed sovereignty'. The erosion of farmer sovereignty over seed – via corporate appropriation of plant genetic resources, growing monopoly power in the seed industry, the development of transgenic crops and the global imposition of intellectual property rights – has become a pivotal issue for farmers the world over. Whatever their many differences, primary agricultural producers of *all* types and in (almost) *all* places find themselves confronting Monsanto (and/or its corporate analogs) in similar fashion, with similar implications for their access to and use of seed. The seed and its attendant political ecology are now a potential vector for

development of the sort of shared consciousness envisioned by Marx (1998, 45) and welcomed by La Vía Campesina (LVC) leaders as ‘a common base ... for globalising the struggle’ (Nicholson in Wittman 2009, 678) against the corporate food regime.

Nor are farmers the only ones subject to the conscientizing influence of the way capital has assumed sovereignty over the seed. Plant breeders in public institutions now find themselves in a position very similar to that of farmers. Increasingly, their access to genetic material, and even breeding methods, are constrained by the proliferation of intellectual property rights which are concentrated disproportionately among a narrow set of large and powerful firms. The debilitating effect of such limitations on these breeders’ ‘freedom to operate’ is accompanied by declining funding and by institutional pressures to shape their research in ways that complement – rather than compete with or provide alternatives to – the objectives and interests of the ‘Gene Giants’. For at least some public breeders, the mismatch between their normative commitment to public service and the demands for accommodation with industry is a motivation to seek another path.

A material expression of this tendency can be seen in the creation in the United States of the Open Source Seed Initiative (OSSI), of which I am a founding member. Organized by a working group of public plant breeders, private breeders, non-governmental organizations (NGOs) and sustainable food system advocates, OSSI intends to encourage and reward the sharing rather than the restriction of germplasm, to revitalize public plant breeding and to integrate the skills and capacities of farmer breeders with those of plant scientists. A key tool for achieving these goals is development of ‘open source’ licenses that preserve the right to use material for breeding and the right of farmers to save and replant seed. Modeled on the legal arrangements successfully deployed by the free and open source software movement, OSSI hopes that its licenses might undergird the creation of a ‘protected commons’ populated by farmers and plant breeders whose materials would be freely available and widely exchanged but would be protected from appropriation by those who would monopolize them. Although constituted as a North American initiative in the first instance, it is OSSI’s ambition to catalyze the establishment of allied initiatives among indigenous peoples, in the Global South and in Europe.

That sounds nice in theory (Kloppenburg 2010). The actual process of implementation has been rather more complicated than we of OSSI had hoped. And here the quotation from poet Audre Lorde is germane. An open source license is a tool constituted by the provisions of contract law, backed by the authority of the state. As Lorde warns, it is a tool of the master inasmuch as the structure and provisions of the legal system have for the most part been designed to facilitate the activities of the dominant stakeholders in the overarching social formation. That does not mean that space for progressive and liberatory action is absent, for taking Lorde at face value is to subscribe to a species of determinism. But we at OSSI should surely take her caution seriously. Re-purposing contract law is not simple, and it is prudent to assess the degree to which it implicates us in relationships we might prefer to avoid as well as the degree to which it might produce the genuine change that we desire.

This paper represents an initiation of that assessment through engagement with some of the key issues that have been raised in our efforts to develop OSSI licenses and to transmit our sense of possibility to potential allies and cooperators. At a practical level, we have encountered a variety of technical, legal obstacles to drafting workable licenses that are making us rethink our relative emphasis on the normative goal of reintroducing an ethos of sharing for germplasm exchange versus the pragmatic goal of creating a legally enforceable mandate for sharing. Quite apart from these practical considerations, the open source

route to recovery of seed sovereignty looks different, and is differentially appealing, depending upon location in the geo-social landscape. Especially in the Global South, among food sovereignty advocates with whom OSSI would like to make common cause, there is distrust of an initiative whose dependence on a formal license appears as one more application of the legal tools of the master which have already been so destructive of farmer sovereignty over seeds.

Further, the genesis of OSSI in a North American political economic context lends the project a distinctive structural orientation. The public breeders, farmer breeders and private breeders who constitute OSSI's core membership are committed to the twin principles of farmers' right to save and replant seed and to open access to material for breeding purposes. But they also believe that breeders of new, commercially available plant varieties should be rewarded for their contributions. Therefore, OSSI is developing a royalty-bearing 'open source' license. This is unacceptable to some in the Global South (and North), but others welcome a proactive approach that could provide opportunities for the development of small-scale and cooperative seed businesses. Additionally, while OSSI members are oriented to the organic sector and to participatory breeding, they do not share the uncompromisingly rejectionist stance toward genetic engineering that is common to many advocacy organizations in the North and South.

So, while the OSSI initiative might hope to be useful beyond its North American intendment, there are fault lines that need to be recognized and addressed as it looks further afield for allies. Here again, the experience of the free and open source software movement is relevant. Whatever the potentialities of a tool, the scope of its effects depends mostly on how it is used and by whom. Richard Stallman – a principal progenitor and major figure of the free software movement – decries the loss of a normative emphasis on 'freedom' associated with the emergent prominence of an 'open source' tendency which he suggests is framed narrowly as a 'development methodology' designed to 'appeal to business executives by highlighting the software's practical benefits, while not raising issues of right and wrong' (Stallman 2013). Whether OSSI supports a mere 'development methodology' or contributes to Lorde's 'genuine change' will depend on how it negotiates these tensions.

The master's toolbox

If we are to assess the ways in which some of the master's tools – licensing and contract law – might be used in ways that the master didn't necessarily intend, we need to examine the character and operation of those instruments. For capital, the challenge has been to find ways to separate farmers from the autonomous reproduction of planting material and to bring them into the market for seed every growing season. There are two routes to this objective, one technical and one social. The technical path involves the plant breeding method of hybridization which renders the resulting crop economically (though not biologically) sterile. The development of hybridization has been extensively discussed (Kloppenborg 1988) and need not be rehearsed here except for the observation that the profits produced by hybrids financed the growth of a robust private seed industry that then had both the resources and motivation to continue the commodification of the seed. Because many important crops cannot be easily hybridized (e.g. soybeans, wheat), a second path to corporate seed sovereignty was pursued: control via legislative fiat.

And for capital the law has been a consistent and powerful mechanism for commodification of the seed in the United States, in Europe and globally. As early as the 1890s, seed companies in the US had begun agitating for application of intellectual property rights to

new crop varieties. In 1930, they settled for a Plant Patent Act covering some asexually reproducing species. European seed companies, no less interested in the commodification of germplasm than their American counterparts, introduced patent-like ‘plant breeders’ rights’ (PBR) through the creation of the Union for the Protection of New Varieties of Plants (UPOV) in 1961. UPOV became both the model and justification for passage of the similar US Plant Variety Protection Act (PVPA) in 1970. A major difference between US and European approaches to restricting farmers’ access to germplasm has been the use in the European Union (EU) of a ‘Common Catalogue’ which has prohibited the exchange or sale of any but the officially approved and listed cultivars (Bocci 2009). In the US, the seed industry vigorously opposed application of varietal quality standards or limitations on its marketing strategies.

Though revisions have further circumscribed their original rights under UPOV and PVPA, farmers can still save and replant seed of protected varieties for their own use, and breeders can employ those materials for the production of new cultivars. However, neither a ‘farmer’s exemption’ nor a ‘research exemption’ is available for material protected under US utility patent law. And with the 1980 *Diamond v. Chakrabarty* decision of the US Supreme Court, plants became patentable subject matter. A series of legal challenges over the past 15 years (i.e. *Asgrow Seed Co. Winterboer*, 1995; *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred*, 2001; *Bowman v. Monsanto Co.*, 2013) have served only to confirm and reinforce the status of new crop varieties – and genes, and gene sequences, and tissue, and plants and seeds – as intellectual property. Although the European Patent Office has held that patents on plant varieties *per se* should not be issued, genes and gene sequences are patentable and their insertion in plant varieties redounds to a *de facto* patenting of the variety (Louwaars *et al.* 2009). With a few exceptions (Australia, Japan, Korea), patenting plants and/or plant genes is not countenanced outside North America and the EU. However, the ‘trade-related aspects of intellectual property rights’ (TRIPS) provisions of the World Trade Organization (WTO) require that member nations institute some form of intellectual property rights (IPR) for plants. Many countries simply accede to UPOV (Blakeney 2012), while others are coming under direct bilateral pressure from the US and EU nations to institute ‘TRIPS-plus’ arrangements that go beyond UPOV to more closely approximate patent regimes (Vivas-Egui and Oliva 2010).

The availability of utility patent protection for plants and plant improvement processes and technologies has been aggressively embraced by both public and private interests. Even as applications for PBR have risen constantly since 1980, they have now been overtaken by an enormous pulse of utility patent applications which began in 1990 (Graf *et al.* 2003, Pardey *et al.* 2013). Although the number of patents applied for annually is increasing in both the US and Europe, the number of applicants is decreasing. In the period 2004–2008 the five so-called ‘Gene Giants’ (Monsanto, DuPont, Syngenta, Bayer, Dow) accounted for 83.4 percent of patent applications in the US (Pardey *et al.* 2013, 28) and 35 percent of applications in the EU in the years 2003–2007 (Louwaars *et al.* 2009, 36). These patterns reflect a continuation of the historical increase in the level of concentration in the seed industry. Consolidation by dominant firms has been extended domestically and internationally, with a new emphasis on acquiring vegetable seed companies (see especially Howard 2009). The leading six companies now enjoy an estimated 66 percent market share of global commercial seed sales which are valued now in excess of \$US35 billion (ETC Group 2013, 3). This market power is both enabled and enhanced by the ownership of key patents on enabling technologies used in the production of cultivars containing genetically modified (GM) traits which are themselves patented. The need to license these traits

ties remaining local and regional seed companies to the Gene Giants and also acts as a barrier to entry for potential new firms.

The mutually reinforcing effects of concentration and patenting have had significant effects on farmers, perhaps most clearly in the US. The rapid adoption of genetically modified organism (GMO) varieties of maize and soy is well established. Less well recognized is that this widespread acceptance of transgenics by producers has less to do with increased yield than with a desire on the part of hard-pressed farmers to simplify their managerial options (Zilberman *et al.* 2013). As ‘treadmill’ theory explains, farmers have faced difficulty retaining the economic gains from adoption of the new varieties in the face of prices for corn and soy seed that more than doubled between 2001 and 2010 (Fuglie *et al.* 2012). The practice of ‘stacking’ multiple GM traits in one variety raises prices further and ensures that features that might be going off-patent are connected to one for which a patent is still in effect. Though a growing number of farmers would like to return to less complex or even non-GM varieties, concentration in the industry now means that there are few alternative sources of seed. Moreover, most of the surviving independent seed companies have little capacity for research and have few alternative varieties to offer. The possibility of saving seed for plant-back in the next growing season is limited by utility patent law under which there is no farmer exemption. The aggressive character of Monsanto’s systematic campaign against such use is surely designed as an object lesson for all producers (Center for Food Safety 2004). The recent unanimous decision of the US Supreme Court in *Bowman v. Monsanto Co.* clearly establishes the position of the juridical superstructure in support of the principle that saving and growing seed from a patented plant is indeed a prohibited making.

Concentration in the seed industry has now proceeded so far – at least in the United States – that intellectual property arrangements need no longer even be the chief means for disciplining the farmer. Indeed, when competing companies and varieties are effectively absent, the dominant oligopolists are in a position to dictate to farmers the very conditions of access to seed. The mechanism for this is what legal scholars call ‘private ordering’ which relies not on patent law but on contract law. The concrete form this takes is the ‘bag tag’ or, formally, the ‘Technology/Stewardship Agreement’ as Monsanto terms it. The ‘bag tag’ is a ‘shrink-wrap’ license accompanying a bag of seed. Opening the bag constitutes agreement to the terms of the license which include, at length and explicitly, not to save or replant seed or to hold Monsanto accountable for any form of liability. Note that the farmer does not buy or own the seed, the farmer *licenses its use* (Winston 2008). Such licenses are now in common use for grain crops in the US by Monsanto, DuPont, Syngenta and Dow, and surely others. Seminis, a vegetable seed company owned by Monsanto, has developed and deployed a streamlined version of its license suitable for printing on a consumer-sized seed packet. It is not clear how extensively this form of licensing is used in Europe, though the European Seed Association’s *IP Enforcement Tool-kit* does include instructions on the use of language for contractual sales terms to disallow ‘further production and/or reproduction’ (European Seed Association 2011, 3).

Although a great deal of attention has been focused on Monsanto for its dogged pursuit of farmers allegedly violating contracts or infringing its patents, many more companies are actually deeply but less visibly involved in global enforcement of the privileges to which IPR and contract law entitle them. The February 2013 issue of the trade journal *Seed World* carries full-page advertisements from each of two companies – Agro Protection USA Inc., and Seed Technology Education Program – which offer their services for ensuring grower ‘compliance’ with IPR requirements. Rather than outsource such enquiries, some companies have banded together to encourage farmers to inform on one another.

The Farmers Yield Initiative (FYI) is a coalition of 37 private and public partners which 'has the collective goal of advancing wheat research, education, seed certification, and the enforcement of intellectual property rights under the Plant Variety Protection Act (PVP) and patent laws' (Farmers Yield Initiative 2013). The FYI website provides a link to 'Submit a Tip' via snail-mail, email or a 'toll free number' which (at least when I called it) connects to a private law office in Arkansas. Although FYI may appear to be an example of typically American excess, the Anti-Infringement Bureau for Intellectual Property Rights on Plant Material (AIB) – a group of 14 European and Japanese seed companies, plus Monsanto – prominently places a large, red 'Report Piracy Now!' button on *all* of its web pages (Anti-Infringement Bureau 2013). Similar enforcement activities have emerged in Colombia and Brazil.

What does give the American FYI project an especially Orwellian flavor is the participation of 14 public agencies: eight land grant universities, three state crop improvement associations, a university research foundation, a state seed department and the United States Department of Agriculture's Plant Variety Protection Office. The active involvement of these institutions in so ethically problematic an initiative is an indication of how powerful the chronic debilitating pressures on public plant breeding have been. Foremost among these has been a long-term decline in federal and state funding for public agricultural science generally and for classical plant breeding in particular. Public institutions have been powerfully attracted to contractual relationships with industry in order to replace diminishing resources, and public plant breeders have often found it necessary to depend on royalty-bearing germplasm releases to maintain their programs. Closer financial and intellectual ties to a concentrated commercial seed sector compound historic pressures for public researchers to move away from the production of finished cultivars in favor of basic research and germplasm enhancement that complements rather than competes with private work (Coffman *et al.* 2007).

Public breeders who persist in a commitment to serve more diverse clients or broader objectives in their work are constrained – no less than farmers – by the tools of the master. Widespread patenting of germplasm, research technologies and breeding methods has resulted in a 'patent thicket' whose effects have been characterized as a 'tragedy of the anti-commons' (Heller and Heisenberg 1998). Negotiating the dense accumulation of intellectual property rights that potentially surrounds the material and methods of their work in order to assess and to obtain 'freedom to operate' is now a substantial transaction cost for breeders. Since such costs are independent of size of enterprise, their discouraging effect is greatest on public researchers, small seed companies and farmer breeders (Graf *et al.* 2004). In any case, access to patent-protected genetic or technical resources is not assured. Unlike PBR and PVPA, under utility patent law there is no research exemption and any use of patented material – even of seed for a simple variety trial – cannot be undertaken without the permission of the patent owner, and this is not uncommonly refused (Pollack 2009).

Universities have taken to mimicking private practice, and any exchange of materials, even between public scientists, is now accompanied by another expression of contract law, the Material Transfer Agreement (MTA). An MTA sets out provisions of permitted use and specifies ownership of the research results flowing from use of the material. Uncertainty as to what is patented or what is even patentable creates yet another level of constraint. Breeders who are part of OSSI cite multiple instances of traits that they are familiar with and currently using, but which have now been patented by the Gene Giants. The OSSI breeders would like to continue to use or release lines incorporating those traits, but they are refraining from doing so because of potential patent infringement issues. The intellectual property

offices of the public institutions which employ these breeders agree that the patent claims made by the companies are likely not defensible in court. But the breeders are nonetheless advised not to proceed with their work, because the cost of even a successful lawsuit involving a deep-pocket transnational would be prohibitive. Monopoly power is being used to obstruct research and impede innovation, a clear inversion of the intent of patent legislation.

The reduction of capacity and reorientation of effort by public research has proceeded in Europe and the Global South as well as in the US, though in somewhat different form. In the United Kingdom, public breeding has been almost non-existent since the privatization of the Cambridge Plant Breeding Institute in the late 1980s (Murphy 2007, see especially Chapter 9). Other European countries retain a significant public plant breeding presence, especially in the area of participatory plant breeding, which is almost entirely absent in the US and which presents a very fertile platform for farmers and scientists to mobilize to work for new modes of plant improvement (Almekinders and Hardon 2006). The Gene Giants are, of course, influential in Europe. But the power of Monsanto *et al.* is to a significant degree diluted by a robust mid-scale contingent of mostly vegetable seed companies that are the backbone of the European Seed Association. These companies share with the Gene Giants a taste for PBR and a distaste for farmer plant-back, but are considerably less enthusiastic about patents because of the way they have seen patents used in the US to accelerate concentration and enhance the market power of a few firms.

Although there is growing momentum toward the US model of patenting (Louwaars *et al.* 2009), the principal thrust of European intellectual property rights in plant breeding has historically been centered on PBR as codified by UPOV, but in a distinctive and critical synergy with the Common Catalogue. Like PVPA, the provisions of UPOV have been tightened to prevent farmers from saving quantities of seed larger than what would service their own land. But the Common Catalogue requirements prohibit even the exchange, much less the sale, of seed of varieties not approved and listed in the Catalogue. Listing entails a variety of administrative obligations and requires that a variety be distinct, uniform and stable (DUS). The DUS criteria effectively disqualify many cultivars bred by farmers and/or those bred for alternative cropping systems such as organics. For a European farm population far more accustomed to seed sharing and on-farm selection than its American counterparts, this restriction is a major concern over and above the continuing efforts of the seed industry to force them to respect PBR. Ironically, in the US, there are no (very few) farmer breeders but, if there were, they could sell what they bred; in Europe there are many farmer breeders but they cannot sell what they breed.

For seed sovereignty advocates in the Global South, the threat to farmers and breeders of the US patent model is well recognized, and only a few nations now countenance that practice. Nevertheless, the pressures to accept utility patenting, often justified as a means of accessing proprietary material and methods, will continue. An example of the sort of stealth decisions that may gradually erode resistance is the recent change in 'Management of Intellectual Assets' by the CGIAR (Consultative Group on International Agricultural Research) system. The CGIAR centers may now establish – or even allow third parties to establish – intellectual property rights over their assets when such action is 'necessary for the further improvement of such Intellectual Assets or to enhance the scale or scope of impact on target beneficiaries' (CGIAR 2013). The implications of adherence to the UPOV convention are actually the more immediate issue. Already many Latin American nations have joined UPOV, and a strict interpretation of its language would prohibit saving seed or a protected variety for any purpose but use on the farmers' own holding. Actually, the European experience with the Common Catalogue may contain the most important lesson for maintenance of free exchange and continued development of farmer

varieties in the Global South. The introduction of seed quality and phytosanitary laws not directly tied to intellectual property rights are now ubiquitous and relatively uncontested worldwide. While they are commonly justified by the alleged need to maintain seed purity and ensure varietal quality, their requirements for registration and certification determine what is legally marketable and too often have the effect – as with the Common Catalogue – of disadvantaging or excluding farmers and small seed producers (GRAIN 2005, Santilli 2012).

Over the course of nearly a century, legal arrangements have been used very effectively as a tool to achieve and maintain a quite considerable degree of corporate sovereignty over the seed. The tools of intellectual property law, contract law and regulation have been deployed to separate farmers from the autonomous reproduction of seed and to emasculate public sector breeders who could – and should – be providing alternatives to corporate cultivars. The loss of seed sovereignty to the Gene Giants is by no means complete. But it would be an error – and a serious misreading of historical momentum – to imagine that an increasingly narrow set of masters will not continue to wield the legal tools available to them in the service of achieving total sovereignty over the seed.

No to the tools of the master, yes to seed sovereignty

These contours of the commodification of the seed detailed above have been widely recognized and extensively analyzed for more than 20 years (see, e.g., Mooney 1979, Kloppenburg 1988, Shiva 1997, Mgbeoji 2006, Mushita and Thompson 2007, Aoki 2009). Nor are these issues new to the peasants, farmers and indigenous peoples who have for decades directly experienced the effects of the privatization of plant genetic resources. The challenge now is not so much to understand what is happening – that's been pretty clear for a long time – but to determine what is to be done about it. And deciding what *is* to be done can usefully be informed by recalling what *has* been done.

Pat Roy Mooney's 1979 book, *Seeds of the Earth: a private or public resource?*, framed the central issues clearly, brought international attention to the political economy of plant genetic resources and catalyzed a movement that sought redress for asymmetric patterns of North/South seed flow in the Food and Agriculture Organization (FAO) of the United Nations. In 1983, FAO members voted to establish an International Undertaking on Plant Genetic Resources that declared commercial cultivars and breeding lines as no less the 'common heritage of mankind' than the landraces and farmer varieties that have been so abundantly collected for so long under that rubric by the companies and research agencies of the Global North. This initiative set off a long and complex series of geopolitical negotiations intended to create an equitable multilateral framework for managing 'facilitated access' under an acceptable form of 'benefit sharing'. These talks finally produced the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in 2002, an agreement that to date has still not been ratified by the US.

As protracted negotiations ensued in the FAO, other modalities for providing a reciprocal flow of benefits to providers of useful plant genetic material were explored. A surge of activity in 'bioprospecting' during the 1990s generated many proposals for bilateral agreements through which indigenous and farm communities might be compensated for their willingness to supply genetic resources. Deployed in a number of instances, these arrangements not only failed to deliver any significant benefits but frequently caused considerable social disruption and were actively damaging to the contracting communities (Nigh 2002, Hayden 2003, Greene 2004). The TRIPS requirement for *sui generis* provision of some form of intellectual property protection for plants appears to offer a means for incorporating

some recognition of community or traditional resource rights in national laws. Such efforts – in places as diverse as India (Shiva *et al.* 2013) and Italy (Bertacchini 2009) – have so far resulted in rhetorical affirmations of farmers' rights or represent quite modest gains which are diluted by and/or subordinated to conventional property law. The foremost example of this latter process is surely the final version of the ITPGRFA itself which makes Farmers' Rights subject to national legislation, permits patenting of lines derived from material in the multilateral system and fails to provide a workable and legally defensible framework for benefit sharing. US Secretary of State John Kerry can now advise the US Senate that it ought to ratify the Treaty since, he argues, it effectively changes nothing and full participation will put his State Department negotiators 'in the best position to protect the interests of US farmers, researchers and industry' (US Senate 2010).

A wide variety of academic and policy analysts have been grappling with what to do about the asymmetric and unjust character of plant germplasm use and exchange. Some are so overwhelmed by practical complexities and moral ambiguities that they fail to provide any effective guidance at all (Gepts 2004, Eyzaguirre and Dennis 2007). Some agree that *something* needs to be done about the injustices, but that the realities of corporate power and a hegemonic capitalism require a situational pragmatism that involves cutting the best deal you can. Dusting off an old seed industry apologetics, Brush (2007, 11) concludes that existing mechanisms of development assistance and technology transfer represent sufficient means of ensuring 'reciprocity' and 'benefit sharing'. Cary Fowler, of the Global Crop Diversity Trust, flatly declares that 'for better or worse, the debate concerning whether the international community will sanction the existence and use of IPRs in relation to germplasm ... is over' and that 'Anyone who is not happy will remain unhappy' (Fowler 2003, 3, 11).

Fowler's conclusion is not very satisfactory for most farmers and peasants. Nor is it satisfactory for a significant number of citizens worldwide who may have never put a seed in the ground but who do eat and who are part of the quite robust movement opposed to 'biotechnology' in particular and corporate globalization more generally. The seed has become a key nexus in awareness of and opposition to the neoliberal project of restructuring the social and natural worlds around the narrow logic of the market (Kloppenborg 2004, Schurman and Kelso 2003). Nevertheless direct agricultural producers do have a focused interest in seed that has led them to organize – and to be organized – in distinctive fashion.

There are many organizations around the world working on seed matters, but two of the most prominent are La Vía Campesina (LVC; <http://viacampesina.org/en/>) and Navdanya (<http://www.navdanya.org/>). Both initiatives were begun about the same time: Navdanya in 1987, and La Vía Campesina in 1992. Navdanya is dedicated explicitly to achieving 'seed freedom' and its activities are geared principally to programs in India. However, through the charismatic personality, prolific writing and international connections of its founder, Vandana Shiva, it has global discursive influence. LVC, by contrast, is an organization of organizations, a network of peasant/farmer and indigenous groups which is broadly committed to a bundle of structural objectives summarized under the term 'food sovereignty' (Desmarais 2007). Between them, Navdanya and LVC express understandings of the nature and dimensions of 'seed sovereignty' that are widely held among producers and advocacy groups in the Global North and, especially, the Global South. If OSSI has ambitions to contribute to a social movement rather than supporting a mere development methodology, it needs to understand how its approach is compatible with or diverges from the positions and perspectives of its projected movement allies.

Although this paper foregrounds the phrase 'seed sovereignty', it is important to note that neither Navdanya nor LVC commonly use that formulation to refer to their approach

to seed issues. The term has recently begun to appear in Navdanya's materials as another way of expressing their more ubiquitously deployed concept of 'seed freedom'. It is almost entirely absent in LVC's discourse, perhaps because even though seed is a central concern, LVC's conception of what constitutes food sovereignty also embraces land tenure, gender, water rights, demilitarization and migration. This lacuna in usage gives me an opportunity to use 'seed sovereignty' as a heuristic domain into which I will place features that seem to me common to the perspectives of both Navdanya and LVC.

Of course, LVC has always recognized control over genetic resources as a key component of its struggle, and early on identified 'seeds as the fourth resource ... after land, water and air' (LVC 2013a). The core elements of LVC's stance on biodiversity and genetic resources were laid down in a position paper written in October 2000 (LVC 2001), and have not changed materially. In the last two years, seed issues have come to the fore for LVC as a meeting of the governing body of the ITPGRFA galvanized publication of the 'Bali Seed Declaration' (LVC 2011), *Our seeds, our future* (LVC 2013a) and the 'Jakarta Call' (LVC 2013c) for food sovereignty. Navdanya has always been about seeds, first and foremost ('navdanya' means nine seeds). Although 'Seed Freedom' has long been its organizing metaphor, 'seed sovereignty' (along with 'food sovereignty', water sovereignty and 'land sovereignty') has now made its way onto Navdanya's web home page as one of the core elements of its overarching goal of 'Earth Democracy'. In 2013, Navdanya published *The law of the seed* (Shiva *et al.* 2013), an updating of the 2006 *Manifesto on the future of seeds*. Both publications reflect the ideas of a set of the international advocacy associates of Vandana Shiva. More recently, Shiva issued a statement on 'The seed emergency: the threat to food and democracy' (Shiva 2012a) and invited supporters to sign on to a 'Declaration on seed freedom' (Shiva 2012b). In what follows, I draw upon these documents to draw the outlines of what I will call 'seed sovereignty'.

From a review of Navdanya and LVC materials, I distill four principal and constitutive dimensions of seed sovereignty:

- *The right to save and replant seed.* The irreducible monad of what LVC (2011) describes as 'a war for control over seeds' is the right to save and replant seed. It is precisely this circuit that capital seeks to sunder using both technical and legal tools. The ur-principle of seed sovereignty is that farmers 'must be autonomous in terms of seed' (LVC 2013b). From this core commitment flow a number of linked propositions.
- *The right to share seed.* Following closely on the right to save and replant one's own seeds is the right to share those seeds with others and to receive seeds from others. It is on this foundation of open, reciprocal exchange that crop genetic diversity has, for millennia, been maintained and increased. While it is fundamental that farmer-to-farmer exchange should be unimpeded, there is also a clear sense that plant genetic resources are a 'treasure that we farmers generously place at the service of humanity' at large (LVC 2011). Preserving the shared access of the global community to these materials requires the 'safeguarding of commons against privatization' (LVC 2013c), or their treatment as a 'public good' (Shiva 2012a, 2012b). But the various and contested meanings of 'commons' and 'public good' are never engaged and a framework for sharing beyond the farm is not explored.
- *The right to use seed to breed new varieties.* The right to save, replant and share seed is linked to the capacity of farmers to generate new cultivars adapted to their own production system. To the extent that farmer breeders respond – as they must – to the

pest, disease and agronomic challenges posed by a rapidly changing ecosphere, they will be developing genetic material of significant utility for a necessary shift to a more resilient, sustainable agriculture. ‘We will continue to share seeds knowing that our knowledge, our science, our practice as guardians of seed diversity are crucial to adapting to climate change’ (LVC 2013c).

- *The right to participate in shaping policies for seed.* The foregoing rights to save, replant, share and breed are precisely the activities that UPOV, PVPA, ‘bag tag’ licenses and utility patents are intended to abridge. As manifestations of a legal superstructure, reform or repeal of such arrangements must be undertaken in the political realm. Accordingly, Shiva and her colleagues propose a ‘Law of the seed’ (Shiva *et al.* 2013), though less as a serious attempt to formulate a concrete regulation than as a discursive device to focus attention on policy options. In its ‘Bali seed declaration,’ LVC demands the ‘enshrining in the laws of each country and at the global level the recognition of the inalienable rights of peasant and family farmers to conserve, use, exchange, sell and protect their seeds’ (LVC 2013a). No less than ‘food sovereignty’, ‘seed sovereignty’ is to be achieved through democratic participation and legislative action.

As organizations directly engaged in struggle, both LVC and Navdanya understand that change is achieved not given. Further, effort must be twofold; that is, the aggressions of the neoliberal project must be opposed, and alternatives must be established, even if only provisionally. Two key platforms for opposition are apparent:

- *Opposition to intellectual property rights.* The leading and most efficacious modality for corporate appropriation of the seed is the imposition of IPR. The effects of IPR mechanisms have been so severe that there is no tolerance for them in any configuration: ‘industrial property over seeds, including patents and plant variety certificates are but different forms of theft ... All forms of patents; plant variety protection and its royalties on farm-produced seeds; as well as other forms of industrial property must be banned’ (LVC 2011). This uncompromising attitude toward IPRs often given an epistemological justification that carries ethical weight: ‘We oppose intellectual property over any form of life. We want to elevate to a universal principle the fact that genes, as the essence of life, cannot be owned’ (LVC 2001, 49); and ‘patents on seeds are ethically wrong because seeds are life forms’ (Shiva *et al.* 2013, 5).
- *Opposition to genetically modified organisms.* Opposition to IPRs is linked to and almost completely coterminous with opposition to GMOs: ‘GMOs and patents contaminate our fields and then prohibit us from using our own seeds’ (LVC 2013a). GMOs are understood as the vector through which both the technical and the social imperatives of the Gene Giants are simultaneously introduced. And just as with IPRs, an epistemological stance adds ethical weight to more material concerns: ‘Life forms, plants and seeds are all evolving, self-organized, sovereign beings’ (Shiva *et al.* 2013, 5). GMOs are opposed not simply because they have problematic or undesirable environmental or social effects, but because genetic engineering violates the integrity of a sovereign entity.

A firm rejectionist stance in relation to IPRs and GMOs is complemented by an affirmative orientation to several core initiatives:

- *Community seed saving and exchange.* LVC categorically scorns the ITPGRFA framework for the multilateral collection, conservation and exchange of plant genetic resources as ‘a contradictory and ambiguous treaty, which in the final analysis comes down on the side of theft’ (LVC 2011). Instead, LVC is committed to strengthening channels for ‘exchanging know-how from farmer to farmer, and organizing collectively to produce and conserve locally our own seeds intended for small-scale farming and organic farming’ (LVC 2013a, 3). Similarly, the central axis of Navdanya’s on-the-ground programs has long been oriented to community-based, *in situ*, dynamic maintenance of farmer cultivars (Shiva *et al.* 2013).
- *Agroecology and participatory breeding.* While farmers’ seeds and knowledge ought to be the foundation for seed sovereignty, there is a clear willingness to develop these resources through a complementary relationship with formal science, scientists and scientific institutions. A distinctive feature of both LVC and Navdanya is their quite recent adoption in discourse of the now mainstreamed term ‘agroecology’ as a referent of the sort of just and sustainable socio-technical forms of production they are working toward. ‘Participatory plant breeding’ (PPB) appears as a fertile vehicle for establishing mutually respectful, power-balanced and synergistic relationships between farmers and plant scientists. LVC’s ‘Bali seed declaration’ (LVC formulation) calls specifically for an ‘agroecology’ involving ‘participative research in farmers’ fields and under the control of farmers’ organizations’. Shiva *et al.* devote three full Articles in their ‘Law of the seed’ to the melding of indigenous and scientific knowledge and practice (Shiva *et al.* 2013, 32–4).
- *Legal sovereignty over seed.* The most powerful expression of ‘seed sovereignty’ would, of course, be some actual and concrete juridical mandate. Both LVC and Navdanya have long demanded recognition of ‘farmers’ rights’, and this is what the ‘farmers’ rights’ clauses of the ITPGRFA were supposed to have affirmed. But, as LVC well understands, 20 years of struggle over the form of the treaty produced little more than an affirmation of the primacy of intellectual property rights. LVC now appears to be placing its energies into the development of an international convention on peasants’ rights broadly conceived (LVC 2011). Shiva *et al.* (2013, 35), in their ‘Law of the seed’ – which is really a discursive intervention rather than a serious juridical proposal – do little more than call for ‘collective ownership of local varieties’. And though LVC also asserted farmer ‘ownership’ in its early formulations (LVC 2001, 49), it is not at all clear what that term means, or how it would be operationalized, or reconciled with objectionable forms of ownership or with the principle of sharing or with the concept of the commons/public good.
- *Openness to allies.* Neither Navdanya nor LVC anticipate realizing their goals without the active participation and material assistance of allied organizations and interests. Navdanya has long worked with a wide range of advocacy and activist groups and most of its outreach is intended to engage and mobilize citizens’ and advocacy groups. LVC is not an organization, but a ‘movement of organizations’ (Nicholson 2012, 2). Although LVC limits its membership to small farmer/peasant organizations, it welcomes ‘strategic alliances’ (LVC 2013c). According to LVC leader Paul Nicholson (2012, 4), ‘We need NGOS, but our alliances must be based on strategic agreements and political objectives in order to accomplish a priority task’. LVC can be thought of as autonomous, but not autochthonous.

From this heuristic exercise, ‘seed sovereignty’ emerges as a coherent set of linked features. What is perhaps most apparent is a robust rejection of the technical (GMOs) and legal

(IPRs) tools of the master. This oppositional stance is balanced by a clear set of affirmative tendencies that are informed by a core set of foundational principles. Plant genetic resources are understood as a broadly social product, a collective heritage of farming communities that should be freely exchanged and disseminated for the benefit of all. Seed sovereignty would ideally be manifest in a legally defined space in which sharing is unimpeded by IPRs. This space is further envisioned as a space in which farmers can continue to apply their local knowledge and ingenuity in the service of an agriculture that sustains not only their communities but the environment. In this, farmers are not expected to work alone, but could look to formal scientific institutions to cooperate in the enterprise of plant breeding and improvement, albeit in a more equitable manner that embraces participatory engagement with farmers themselves and is directed to the production of diverse range of socially and environmentally appropriate plant varieties. It sounds nice. Could OSSI be a part of moving that vision forward?

OSSI: seeds should be free as in speech, not as in beer

My own enthusiasm for OSSI is rooted in the same frustrations that so thoroughly inform LVC's spurning of the 'benefit sharing' provisions of the ITPGRFA as being 'offered the proceeds from the theft of our seeds' (LVC 2011). The legitimacy of plant genetic resources as the 'common heritage of mankind' was called into question at the FAO during the 1980s because, as it expanded globally, the seed industry had begun using IPRs to exclude others from access to their varieties for multiplication and breeding purposes. The problem was not that seed companies were obtaining and using crop genetic resources, or even that they were selling seed, but that they were restricting access to and preventing the use of materials that, as a matter of reciprocity, ought to have been shared. It is this failure of reciprocity – and, with patenting, the elimination of the right to replant and to use for further breeding, the loss of the *derivative right to use* – that is regarded as asymmetrical and therefore unjust. The inequitable nature of this practice has been compounded as corporations have used IPRs over genetic materials not just to accrue monopoly rents, but to actively undermine the independence of farmers and the integrity and capacity of public plant science. Significantly, the initial strategic response at the FAO in 1983 was not to make companies pay for genetic resources but to declare that what they claimed as proprietary lines were in fact part of common heritage. This position was deemed impractical by many and the debate was soon transformed from how to enlarge the commons to how make industry pay for its raw materials.

I was one of those who in the 1980s argued for what I now regard as a marketized and therefore misconceived and inadequate response (Kloppenborg and Kleinman 1987, Kloppenborg 1988). The logical outcomes of that strategy are the flawed, compensationist approaches to 'access and benefit sharing' that have neither protected farmers and indigenous peoples from biopiracy nor brought them any benefit, but have functioned mostly to legitimate and institutionalize their continued expropriation. The really radical route to reestablishing symmetry in flows of crop germplasm was not to arrange payment for access to genetic resources in addition to IPR lines, but to work for reconstitution of the commons for both types of germplasm. But I *was* correct, back in 1988, in my judgment that pulling the companies' breeding lines into the status of common heritage was not a workable approach, and that continuing to maintaining peasant landraces as a freely accessed mine for genetic resources was unjust. Is there a way out of this conundrum? Perhaps what is required is a mechanism for germplasm exchange that allows sharing among those who will reciprocally

share, but excludes those who will not. What is needed is not recreation of the inadequate *open-access commons*, but creation of a *'protected commons'*.

A 'protected commons', as Richard Jefferson (2006, 23) has so aptly phrased it, is precisely what an open source approach is designed to create. Frustrated by expanding constraints on their ability to add to, modify and share as freely as seemed personally and socially desirable, individual software developers have sought ways to create space in which they could develop content and code that could be liberally exchanged and built upon by others, but not appropriated and privatized by corporations. As Richard Stallman so memorably explains, "free software" is a matter of liberty, not price. To understand the concept, you should think of "free" as in "free speech", not as in "free beer" (Stallman 2002, 43). The right to derivative use is the core of free and open source software (but note that Stallman refuses to accept 'open source' as an adequate descriptor since it does not explicitly reference 'freedom').

The tool for achieving this freedom of derivative use is a license, a form of contract. Open source software is copyrighted and then made available under a license that permits further modification and distribution as long as the modified software is distributed under the same license. This arrangement produces a 'viral' effect that, critically, enforces continued sharing as the program and any derivatives and modifications are disseminated. Also critically, the virality of the license also prevents appropriation by companies that would make modifications for proprietary purposes since any software building on the licensed code is required by the license to be openly accessible. This feature – called 'copyleft' – is what distinguishes 'open source' from mere 'open innovation'. Thus, software developed under an open source license is released not into an open innovation/open access commons, but into a 'protected commons' populated by those who agree to share but effectively inaccessible to those who will not. In this way 'copyright or patent rights are exercised to share and socialize intellectual property – counter to the very meaning of the exclusivity that characterizes it' (Dusollier 2007, 1394). That is, the tools of the master are re-purposed in a way that the master did not intend and which actively subverts the master's hegemony.

Such re-purposing of the legal tools of the master has been proven very fruitful in the software sector (Weber 2004). Thousands of open source programs are now available, among them the email program Thunderbird, the web browser Firefox, and the operating system known as Linux. The success of these open source software initiatives has inspired a variety of analysts to propose application of open source principles and practices to plant breeding and the seed sector. These ideas emerged more or less independently from a variety of disciplines – plant breeding itself (Michaels 1999), molecular biology (Jefferson 2006), sociology (Kloppenburg 2010), law (Aoki 2009, Hope 2008) – and from diverse geopolitical positions – North America (Michaels 1999), Europe (Hughes and Deibel 2006/7) and the Global South (Douthwaite 2002, Srinivas 2002). Elsewhere, I too have suggested that development and deployment of a copyleft, open source license for germ-plasm appears to offer a 'fecund modality for impeding further dispossession and for the pursuit of concrete initiatives for the actual repossession' of seed sovereignty (Kloppenburg 2010, 385–6). But, how might such a project actually be undertaken?

In April 2010, a small meeting was held in Madison, Wisconsin, USA, to explore the prospects for implementing some sort of open source initiative for seeds. Attending were six North American public plant breeders, one North American farmer breeder, one North American social scientist and three representatives of a Global South advocacy NGO with deep experience with participatory breeding (a fourth Global South participant representing a prominent indigenous NGO was invited but unable to attend). Enthusiasm

for the idea led to targeted recruitment for attendance at a second meeting held in May 2011 in Minneapolis, Maryland, USA. Participation was expanded to include additional public breeders, farmers, indigenous groups from North and South, a small seed company and several non-profit advocacy organizations. Those attending the Minneapolis meeting constituted themselves as the Open Source Seed Initiative (OSSI), discussed principles and objectives and outlined a course of action. The priority task was determined to be creation of OSSI open source licenses, including one that is royalty bearing. Over the past year, OSSI has refined its constitutive principles, retained *pro bono* legal representation and drafted licenses, and has plans to release material under those licenses.

The objectives that OSSI intends to achieve are specified as follows in the latest draft of ‘OSSI basic principles’ (OSSI 2013):

- (1) A germplasm licensing framework with no breeding restrictions on the germplasm released through its auspices other than that derivatives must also be released with the same license.
- (2) A robust, vibrant and well-supported public and community plant breeding sector producing germplasm and cultivars that can be equitably grown, sold, changed and distributed.
- (3) A plurality of sources from which farmers, gardeners and breeders can obtain seed.
- (4) Integration of the skills and capacities of farmers with those of plant scientists for enhancing and enlarging participatory plant breeding.
- (5) Respect for the rights and sovereignty of indigenous communities over their seeds and genetic resources.

On the whole, OSSI’s objectives have considerable goodness of fit with the visions of ‘seed sovereignty’ distilled from the positions of LVC and Navdanya. Although it would be pleased if its project would find traction in other parts of the world and looks forward to supporting sister initiatives elsewhere, OSSI also understands that perspectives shift depending upon geo-social positioning. Indeed, from the first discussions in Madison in 2011, we have been aware of a number of fault lines that potentially restrict the OSSI project – at least as it is presently constituted – to a specifically North American context. Preliminary conversations with representatives of Global South organizations that have long been involved in genetic resource issues – including LVC and some of its key NGO allies – have illuminated those fault lines and have precipitated this consideration of how well the tools of the master can really be used effectively against their creators.

The objections we’ve heard from our potential allies turn not on OSSI’s overall objectives, but specifically on OSSI’s proposals for the use of a license as its performative vehicle. OSSI has been warned that the practical requirements for operation of a license are not workable, that as a restrictive covenant a license is *prima facie* a form of ownership, that no form of ownership should be used or applied to living beings and that a royalty-bearing license is simply another form of PBR.

OSSI’s approach is shaped in significant ways by its genesis in a North American context. Notably, it has emerged from the milieu of institutionalized plant breeding rather than as a project of primary producers. Further, the membership is dominated by plant breeders employed by public, ‘land grant’ universities although it also includes a few breeders from small seed companies and a non-profit organization. The foundational interest in the right of ‘derivative use’ is therefore oriented principally to the use of material for purposes of breeding rather than for planting. In North America, there is virtually no farmer breeding. With declining levels of state support, public breeders now often rely

on royalty revenue for maintenance of their programs. The decay of institutional mechanisms for release of public cultivars and concentration in the seed industry can mean that if public breeders do not provide what companies want, their materials will never be used. OSSI's public breeders are involved in organic and participatory breeding (see Murphy *et al.* 2004), but these projects are difficult to sustain under current funding priorities. OSSI's private breeders are seed vendors whose survival depends on sales. Both public and private breeders are offended and frustrated by concentration, constraints on access to breeding material and the appropriation of their lines by competitors. While they are normatively disposed to a maximally unencumbered flow of plant genetic resources, they are now embedded in a robust market system in which they feel they have no option but to participate; hence their interest in a royalty-bearing license.

As a result, there is in OSSI a significant tension between two tendencies: one for completely unencumbered, 'free' seed, and one for seed carrying some obligation for reward to the breeder. This tension is manifest not only between breeders, but also within each breeder depending on the type of material in question (populations and breeding lines versus finished, commercially valuable cultivars). OSSI therefore decided to develop model licenses for both alternatives with the intent to allow breeders to choose the option that best fits their situation. Believing that only a truly functional license would recruit support and stimulate use, OSSI instructed its legal team to draft licenses that were both 'copyleft' and maximally defensible in court.

Drafts of a 'free seed' and a 'royalty-bearing' license have been completed. What makes both licenses 'open source,' according to OSSI's thinking, is the 'copyleft' requirement in both licenses that all derivative lines and combinations of the licensed material also be free for breeding. Briefly,

- The 'free' license provides the widest degree of freedom of use. As with 'free software', the only restriction is that licensees may not restrict the freedom of others to use the seed in whatever way they wish. Originators of genetic material transferred under this license may not collect royalties and may not restrict usage in any way. Recipients of genetic material transferred under this license may grow the seed, may reproduce the seed, may share the seed, may sell the seed, may conduct research with the seed and may breed new varieties with the seed, and farmers may save and replant the seed.
- The 'royalty-bearing' license allows collection of royalties on the seed, but may not restrict usage in any other way. Recipients of genetic material transferred from the originator under this license may be required to pay royalties on commercial sale of the seed, but may grow the seed, may reproduce the seed, may share the seed, may sell the seed, may conduct research with the seed and may breed new varieties with the seed, and farmers may save and replant the seed.

OSSI has indeed found that the tools of the master are technically very cumbersome, at least for OSSI's purposes. A license is a private contract which, by law, prospective licensees must have an opportunity to read in its entirety. That means that the complete language of the license would have to appear on every package or container of seed sold or exchanged. Moreover, if licensed material is received or acquired without knowledge of the license, the license cannot be enforced in relation to that recipient. Further, in order to achieve robust defensibility, the licenses run seven pages in language that none but an attorney can understand. The probability that such a license will be transmitted for more than a few iterations is very low. This failure to virally propagate would negate the key

and most powerful feature of the open source license approach. Compounding these technical obstacles was a sense among OSSI members that implementing a mandatory, legally binding, lengthy, confusing, unwieldy, restrictive license would bring us perilously close in style and substance to the practices characteristic of the Gene Giants.

These deficiencies were felt to be most debilitating in regard to the ‘free seed’ license which OSSI had hoped would be used liberally among breeders, farmers and gardeners. OSSI is now exploring how the license might be shortened sufficiently to fit on a conventional seed packet *and* retain its legal enforceability. A second – though less appealing prospect – would be to shift to a ‘free seed pledge’ (the actual choice of an appropriate term – pledge, commitment, declaration – is not yet clear). The pledge would consist of a simple, very short, affirmatively phrased statement expressing a commitment to allowing unrestricted use of the seed and its derivative progeny lines. Notably, the ‘pledge’ is not a ‘license’ and would not be legally binding. OSSI is also continuing to develop a royalty-bearing license, which, it is anticipated, could be used for breeding material containing high-value traits or for finished cultivars. Seed companies and institutional breeders are already familiar with complex legal documents (e.g. licenses, MTAs) and it is those actors, rather than farmers and gardeners, who would be the principal targets of a legally enforceable mandate to keep materials freely available.

The objection to a license as a form of intellectual property is a complex issue. For free and open source software, the license is the necessary and indispensable instrument that ensures that anyone who redistributes free software *must* pass along the freedom to use it in any way *except* that the distribution terms cannot be altered. This single restriction on freedom to use (that is, you can only distribute under the original license) is balanced by the preservation of a much larger range of freedoms. The Free Software Foundation addresses this contradiction directly: ‘Proprietary software developers use copyright to take away users’ freedom; we use copyright to guarantee their freedom’ (Free Software Foundation 2012). OSSI’s proposed licenses are based on this same principle. There is surely good reason to be skeptical of an initiative that employs a form of ownership to challenge exclusion and propagate an ideology of sharing. Still, the narrative of the seed as a ‘commons’ (LVC 2013c) or ‘public good’ (Shiva 2012a) is not without its own parallel contradictions. Open access (which is open source without copyleft provisions) neither assures equal access nor prevents appropriation and privatization. Further, ‘property’ is properly understood not as some undifferentiated form of commoditized ‘ownership’ but as a complicated ‘bundle of rights’ to possess and use an object or resource. ‘Farmers’ rights’ are a form of property, as are ‘traditional resource rights’ or ‘community rights’. One of the affirmative features of seed sovereignty is the objective, clearly expressed by both LVC and Navdanya, of establishing some form of legal sovereignty over seed.

It is clear, however, that OSSI’s proposed royalty-bearing license is very close indeed to the forms of IPR that have proven so problematic. Indeed, it might be regarded as ‘PVPA-plus’ inasmuch as its provisions are almost isomorphic with that federal law. The key – and critical – difference is that OSSI’s license contains a copyleft clause that renders any derivative line freely available for breeding and so effectively impedes patenting or locking up of its genetics. A license containing a royalty-bearing option is seen by some OSSI members as a necessary complement to the free seed license. Were public breeders adequately funded, they would not need or desire a royalty flow. But public breeders are not now adequately funded and their extant channels for germplasm release almost always are linked to seed companies. Farmer breeders, small private seed companies, and non-profit institutions involved in cultivar development also see a necessity to have their work rewarded. Their goals are an adequate and legitimate return to their labor, not monopoly profit. Still,

within OSSI itself there is continuing debate over the desirability of pursuing an arrangement that so closely mimics the tools of the master.

In principle, OSSI envisions its royalty-bearing license being applied to agreements with firms reproducing seed for commercial sale, and farmers will be free to save and replant for their own purposes. Royalties are often regarded by Global South movement groups as synonymous with IPRs and as a form of theft (LVC 2011, 3). They surely can be. But OSSI members are also aware of individuals, groups and communities in Latin America and Southeast Asia that are interested in underwriting their activities through development of a market for their seeds (SEARICE 2009). If OSSI can craft a reward system that is fair and preserves access to material for breeding and on-farm use, it may be useful for communities and cooperatives outside North America.

A final cautionary note is that while some may find OSSI licenses too restrictive, others may find them too *free*. Although OSSI's royalty-bearing license violates the Free Software Foundation (FSF)'s definition of adequate 'freedom', we follow FSF's model in placing no other restrictions on derivative uses. This means that once situated in the 'protected commons' by an open source license, materials might be used for purposes unpalatable to the donor. Prominent among these purposes would be genetic engineering, for which many agricultural and sustainability advocacy organizations – and specifically LVC and Navdanya – profess an uncompromising and enduring antipathy. The almost complete identification of the tool (GMOs) with the tool user (the Gene Giants) is understandable, but misconstrued. There is no question that the tool of transgenics has been wielded very effectively by the corporations to advance their particular interests. But their ability to use the tool is a function of their power rather than an endogenous characteristic of the technology itself. Though concerned with how genetic engineering is being deployed, and especially the degree to which it has displaced classical breeding, most OSSI members do not oppose use of transgenics *per se*. Moreover, farmers in India and Vietnam have themselves appropriated the tools of the master and introgressed GM traits into their own cultivars (Stone 2007). The focus of attention on opposition to transgenics has diverted attention from the development of novel genetic technologies for plant breeding which do not involve inter-specific transfers. These techniques, already being touted and justified as non-transgenic, are being aggressively patented according to a familiar pattern (Lusser *et al.* 2012).

Conclusion: the primacy of process

So where does this leave us? I began this paper by asking if the tool of an open source license, birthed within a particular social formation and therefore bearing the marks of that social formation, could nevertheless be re-purposed to liberatory or at least progressive ends. It's not like this question hasn't been asked time and again over the years, as a matter of both strategy and tactics. I've always liked Erik Olin Wright's framing: 'What is needed is what used to be called "nonreformist reforms", social changes that are feasible in the world as it is (thus they are reforms), but which prefigure in important ways more emancipatory possibilities' (Wright in Kirby 2001, 21). An open source license for germplasm appears to be feasible, especially given the example of software. Emancipatory? Well, I've argued that, in a kind of institutional Aikido, an open source license for germplasm could use the structure and the momentum of the legal system itself to move that system in directions its corporate architects didn't intend and which undermine their hegemony (Kloppenburg 2010).

But will it really do that? How does one recognize an ‘emancipatory’ change? Esping-Andersen *et al.* (1976) suggest that a key feature is a ‘noncommodified’ stance that places struggle in a political rather than a market setting. Their admonition works for a ‘free seed’ license which possesses a truly transmogrifying potential. But the ‘feasibility’ of that license is in question. Additionally, some members of OSSI feel that, in the world as it is, we need a royalty-bearing license, at least in North America. And so, *pace* Esping-Andersen *et al.* (1976), we find ourselves with a commodified component to our struggle. And, despite quite broad congruence between the overall objectives of OSSI and advocates of ‘seed sovereignty’, there are nevertheless some serious fault lines that may preclude the emergence and advance of common global initiatives.

The attraction of an open source initiative for me has much to do with the frustration of watching 20 years of non-commodified political struggle for farmers’ rights produce the impotent, and perhaps actively meretricious, ITPGRFA which, after an additional 10 years, the United States still has not condescended to sign. Meanwhile, a concentrating capital has extended its reach into the genescape despite a few symbolically important but functionally largely meaningless rollbacks of the most egregious examples of raw bio-piracy (e.g. the Enola bean, Basmati rice). Open source offers at least the prospect of a shift from continuous defensive actions to the creation of a positive, relatively autonomous space in which capital might be effectively prohibited – by its own rules – from trespassing.

But, as I’ve outlined in this paper, achieving that sort of emancipatory outcome will not be easy. Nevertheless, there is growing international interest in ‘open source’ in its many manifestations. I have just learned of a parallel initiative to OSSI’s that has been organized in Germany (see Kotschi and Kaiser 2012). The concept now has sufficient traction among some plant breeders, seed companies and advocacy groups in the United States to have permitted the founding and elaboration of OSSI. OSSI’s expansive visioning of a legally binding free seed license has been adapted to the realities of ‘the world as it is’. OSSI’s royalty-bearing license conforms even further to ‘the world as it is’. However, I am not ready to assign OSSI to Richard Stallman’s category of ‘development methodology’ rather than ‘social movement’. Really, it is very difficult to anticipate what the future holds for innovative initiatives. The point, it seems to me, is to generate options to be tried.

I think that Paul Nicholson’s insistence that ‘food sovereignty’ need not be definitively rendered ‘*because FS is dynamic, it’s a process*’ (Nicholson 2012, 7) is useful here. Elsewhere, Nicholson observes that for LVC there are ‘spaces of reflection and debate, and spaces of organic articulation of these strategies’ (Nicholson in Wittman 2009, 680). What OSSI is or is not will become clear as it articulates, that is, as it acts. And this process is entirely consistent with what plant breeders do. Plant breeders refer to the ‘G × E’ (gene × environment) interaction which generates the diversity to which they apply the creative power of selection (see especially Tracy 2003). They put the seed into the ground and see what kinds of plants emerge from the chancy interaction of genes and environment. The members of OSSI representing the Global South gave us similar advice: implement OSSI in the US and let’s see what happens. That’s a plan – well, that’s a process.

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Jack Kloppenburg works in the Department of Community and Environmental Sociology at the University of Wisconsin-Madison. He has studied the social impacts of biotechnology, the controversy over control of genetic resources and the prospects for framing ‘foodsheds’ as an analytical basis for developing sustainable food systems. He is currently jazzed by the potential of ‘food sovereignty’ and by the possible application of ‘open source’ principles to plant breeding. He is a founder of the Open Source Seed Initiative. Email: jrkloppe@wisc.edu