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The Voracious Appetites of Public versus Private Property: A View of Intellectual Property and Biodiversity from Legal Pluralism

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ABSTRACT

In an opening vignette to an otherwise insightful article, Carol M. Rose (2003) compares people who hold intellectual property rights to poor villagers in India. They put effort and time into developing small but productive properties, only to have the wild tiger or rogue elephant of the public domain trample them or eat them up. In extreme cases, IP "villages" are abandoned and left to "the jungle" of public property. But Rose neglects another part of the story, and that is that the villagers are also hungry, and while they do not directly consume tigers, they do consume the environment a tiger needs to survive. This paper argues, from the perspective of legal pluralism, that both private and public properties are voracious. In recent western developments, they each expand by trying to 'eating the other up'. Western property theory promotes this dualistic game of voracious property types. In exporting this game world wide through privatization, international agreements and regulations many other more balanced approaches to property, which fall between the public/private divide, are being consumed as well (as in kin group corporate property, cultural property etc.).

Such a dualistic model of property limits our understanding of the ways in which the property rights of different claimants are interdependent. This interdependence arises not only from legal institutions that mediate property rights, but also from social institutions that determine and distribute rights, and how these legal and social institutions interface. The three-tiered model presented in this paper--ideological, legal, and social--reveals the systemic nature of property rights. Issues concerning 'new' forms of intellectual property, as well as the management of natural resources, highlight the limitations of the ideological approach to property rights, which largely ignores the legal and social relationships embedded in these forms of property. This paper explores the implications of such voracious property for biodiversity.

Keywords: Property, intellectual property, biodiversity, natural resources, legal pluralism, institutions

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Melanie G. Wiber[1]

1. INTRODUCTION

In this paper, I address the questions raised by new forms of property as a solution to conserving biodiversity, and the potential interaction of these efforts with ongoing situations of legal pluralism. My research path has led from water and land rights in the uplands tribal areas of northern Philippines (Wiber 1991, 1993), to milk and manure quota in eastern Canada and Holland (Wiber 1995), to fishing quota in the Scotia-Fundy region (Wiber 2000). Recently, I have followed the debates around other new forms of property, including tradable environmental allowances, and the patenting of various life forms. My research has often involved situations where the state has been unable to establish a monopolistic legal regime (in the face of religious law, tribal law, customary law, multilateral agreements), or has itself created and perpetuated situations of legal pluralism through incompatible developments in various branches of state or international law, or when it recognizes the jurisdiction of some bodies of law for some actors in society but not others (see Wiber 1999, Wiber and Kennedy 2001). I am particularly interested in the consequences of legal pluralism for the management of natural resources. In my fisheries research, I work with community-based groups in eastern Canada who attempt a collective level of management despite privatizing regulation by

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the federal government (through Individual Transferable Quotas issued by the Department of Fisheries and Oceans) (see Wiber in press). Their community-based management has been more effective in producing equitable distribution of resource access, but might not necessarily produce long term resource sustainability. What is certain is that private quota rights in fish have produced *neither* equity *nor* sustainability for major Scotia-Fundy commercial marine species.

Here I examine a few of the underlying problems with promoting unrealistic versions of western property concepts as solutions to world-wide natural resource management problems. A major challenge facing those interested in property is the inter-textual nature of recent property studies -- incorporating as they do institutional economics, common property studies, game theory, resource management and public policy studies among others (see Rose 1998a). This inter-textuality, I believe, contributes to what Wolf (2001:21) has called “a descent into triviality”. In particular, in the privileging of the “Big Four” (state, commons, private and open access) as supposedly universal property forms, and in dualizing public and private loci for property rights, property theory has generally lost sight of the systematic nature of property regimes. I suggest several ways in which the systemically-integrated nature of property regimes are downplayed or ignored under neoliberal restructuring arrangements. I also suggest some ways in which simplistic property regime imports may not be conducive to environmental sustainability and biodiversity. The main reason for this is that simplistic Western models are often caught up in a contest between two voracious kinds of property types (public versus private) – both of which appear to be growing by consuming the other. On the other hand the concept of legal pluralism or the "presence in a social field of more than one legal order" (Griffith 1986: 1) can force us to acknowledge that many different

social fields can generate and enforce different rules, norms and cognitive repertoires. These different legal orders can protect various claims to use and control resources - or a variety of different property rights - by individuals or groups. Thus, the private-public dichotomy is an artificial simplification of a much more complex, overlapping and nuanced set of property relations.

2. RECENT PROPERTY DEVELOPMENTS

Property, both as a theoretical concept and as a practical institution, has attracted a great deal of academic attention lately, probably because property has become one way to speak about and demand rights (Ignatieff 2000), and also because of recent innovations in technology and in society that have created much contestation while simultaneously pushing the property envelope to resolve those disputes (see F. and K. von Benda-Beckmann and Wiber 2003). Many pluralist societies are caught up in violent contests over the (re)distribution of productive property, often after attempts to redress old wrongs (Peters 2003). Anthropologists, environmentalists and development officers debate how to simultaneously protect indigenous rights and the environment (Brush 1993, Cleveland and Murray 1997). Food security seems threatened in many Less Developed Nations as important plant staples are patented in the wealthy north, and thereby become subject to restrictions on research and commercial development.[2] State or parastatal agricultural research regimes of 50 years standing are being privatized under restructuring pressure from the World Bank, such that commercial crop seed production and distribution has been disrupted in some nations (Zerbe 2001). Pharmaceutical conglomerates threaten to

[2] As with GoldenRice™ - a provitamin A enhanced rice strain in which over 70 patents exist, mostly unrecognized in major rice producing nations (Binenbaum et al. 2003).

enclose the environmental knowledge of many local peoples.[3] Tradable environmental allowances create rights in airborne emissions, fish stocks, manure and waterborne pollutants (Rose 1999) that are held and traded by individuals, corporations and nation states, and often highly contested at every level. National parks (as conservation reserves) are being managed by private corporations, state agencies, local indigenous communities, international conservation organizations, or consortiums of all of the above – management often contested by international corporations with preexisting mining or timber concessions (Wali 2002). Owners of recently re-privatized lands in the former socialist eastern Europe reject any environmental responsibilities (Sikor 2003). Riots have erupted in Brazil when water systems were threatened with privatization (Hall et al. 2002). Nation states are contracting with pharmaceutical corporations to develop commercial bio-databases for the human genetics of their component populations (Pálsson and Hardardóttir 2002). An academic conference in Berkeley discusses the international trade in humans, their labor, their sexual and reproductive capacities, their children, in human organs, and in other body parts (stem cells, immortal cell lines). How has property theory attempted to address these increasingly complex problems and property arrangements?

3. WHITHER PROPERTY THEORY?

In a recent paper, Keebet and Franz von Benda-Beckmann and I (2003) point out that current property debates are so loaded with a heavy freight of assumptions,

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[3] The Indian neem tree has over 60 U.S. patents applied to it, all contested, as is the University of California and Lucky Biotech of Japan patenting on two natural sweeteners from Africa (katempfe and serendipity berry) (Ostergard, Tubin and Altman 2001).

presuppositions and political and ideological stands that property analysis has become seriously hampered. We argue that this problem can be redressed through two approaches. First, we need to take the bundle of rights metaphor seriously and more deeply explore its implications. Any analytical framework to examine property must be capable of capturing the complexities and manifold variations of property in different societies and in different periods of history, as well as the different functions that property may have. Furthermore, it must be able to differentiate between the separate analytical layers at which property manifests itself in *ideologies*, in *legal institutions*, in actual *social relationships*, and in *social practices* (of production, exchange and reproduction). Further, it must pay attention to the interrelations between these phenomena. The form property takes in any one of these layers can be very different and cannot be reduced one to the other. Finally, any analytical approach must somehow encompass the *plurality* of property ideologies and legal institutions in many contemporary states, often rooted in different sources of legitimacy, including: the official legal system of the state with all its internal contradictions, traditional or customary law, multiple bodies of religious law, plus rapidly developing international law.

We must generate more accurate descriptions of the ways in which property is actually organized and used before there can be much hope for theorizing about interrelations between types of property rights and economic performance or ecologically sustainable resource use. In particular, we need a sophisticated analytical framework if we are to come to grips with the developments in new forms of property, whether created through technological and bio-physical innovations, or as a consequence of increasing government interference in the more conventional property rights to productive resources.

The second solution to property theory triviality is to keep the *systematic* nature of property in mind when discussing the potential impact of any change in property arrangements. Change arrives, often without the theorists noticing or paying much attention. And change is often introduced not through reforms to rights distribution, or to the nature of the objects given property status, nor even to the definition of rights or the source(s) of rights creation. Change, as a result of the systematic nature of property, will often come from directions no one expects, as some of the above examples suggest. I will briefly discuss what I mean by taking both the bundle metaphor and the systemic nature of property seriously before looking at the implications of this for sustaining biodiversity, or for any other perceived good that property arrangements are thought to further.

4. TAKING THE BUNDLE OF RIGHTS METAPHOR SERIOUSLY

Conceiving of property as a bundle of rights in order to explore the relationships between persons with respect to valuable goods, material and immaterial, is a concept rarely elaborated and followed up consistently.[4] One advantage of doing so is that property is not defined in overly simplistic terms, a problem endemic to much current property research. Bromley and Cernea, for example, view property as a right to a benefit stream, the rights therein being dependent on the ability to "call on the collective to stand behind one's claim" (cited in both Lu 2001, and in Knox McCulloch, Meinzen-Dick, Hazell 1998). However, as many of my introductory examples demonstrate, property is complicated by (among other things) the variation between collectives who

[4] For exceptions see Schlager and Ostrom 1992, 1996; F. von Benda-Beckmann 1979, 1995, 2000, 2001; K. von Benda-Beckmann et al. 1997; F. and K. von Benda-Beckmann 1999; Wiber 1993.

might support alternative claimants and the ideologies they deploy as justification, and the wide variation in how these conflicting legal justifications characterize a benefits stream.

Taking the bundle metaphor seriously also tends to work against any notion of "cookie cutter" property types. When the focus is a descriptive rather than proscriptive, property relationships can be seen to vary dramatically across four major elements, including: the *social units* that are thought capable of holding property rights and obligations; the construction of valuables as *property objects*; the different kinds of *relationships* established in terms of rights and obligations; and the *temporal dimension* of property relationships. In each of these elements, there is a wide range of variation both within and between societies and legal systems. The social entities that can be holders of property relationships range from individuals to larger groups or associations of people, kin-groups, co-operatives, villages, large industrial enterprises, the state or even "mankind". In such cases where more than one person holds property together, there is a wide variety of relations possible between the members of the group. Constructions of material and immaterial valuables as property objects also show wide variation. Most legal systems construct important differences by establishing categories of owned goods, and attach quite different legal consequences to them. A major distinction in many legal systems has been the one between movable and immovable goods, another in recent years has been the distinction between tangible and intangible goods (C.M. Rose 2003). The range of autonomy for an actor, especially with respect to alienation or transferability, over different property objects varies considerably for goods in such different categories.

Technological, economic and political developments lead to an ever expanding variety of goods in which property rights can be established, creating a constant need to expand existing categories to include such valuables or to devise new categories for them. These innovations can challenge existing property categories along a number of dimensions: along the public and private divide, between movable and immovable categories, and across ethical or moral boundaries that separate things we feel comfortable turning into commodities and those we do not. Patenting life, especially important food crops or folk biopharmaceuticals has strained the intellectual property envelop, for example.[5] Valuables created under administrative law, such as tradable environmental allowances, enter the marketplace and take on property characteristics, with the consequence that pressure is brought on the government to regularize them as property.[6] The market is often a driving force in this regard; debates about "new property" often result when objects or valuables enter the marketplace for the first time. Examples include increasingly intangible and fragmented valuables such as bioinformatics, stem cells, and domain names on the internet.[7]

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[5] Bettig (1996:2) notes that the "peculiar nature" of informational and cultural commodities places them within the realm of "public goods" (the product cannot be used up by any one consumer) and that these commodities are "prone to market failure." He also notes, however, that capitalist firms have learned to use a variety of mechanisms to overcome this 'public goods as commodities syndrome,' including copyright, patents, trademarks, compulsory licensing, packaging, encryption, price discrimination and so on. One might argue that having learned these lessons well with music and video, the corporate sector was well positioned to take advantage of the information explosion in bio-technology.

[6] C. Rose (1999) has called this the phenomenon of "too much property". The government discovers there are flaws within a concession regime such that public objectives are not being entirely met. They address the flaws through another layer of "command-and-control" regulation, only to find yet more "new property" categories emerging as a result.

[7] Donna Haraway (2000) is critical of the role of science in particularizing the complete to make the parts subject to different rules than the whole – a process based on realms of western reductionist scientific knowledge production. As with gene patents, the scientific labor of particularizing the complete then becomes the basis for a property claim.

Another aspect that seems new is the kinds of property holding entities that have rights in property objects, as in 'cultural' property, which requires delineating cultural boundaries with some precision (see Brush 1993). Other forms of property are considered new because of the property relations that they establish and that are still evolving, as in rights to knowledge. Bioprospecting and biopiracy, for example, are both terms to describe western pharmaceutical research among non-western cultural groups and suggest some of the complexities involved in understanding the often contested nature of relationships involved.

Bundles of rights

The bundle of rights metaphor can facilitate analysis of the possible variation in the relationships between property holders and others with respect to culturally recognised valuables. Property relationships shape the contexts under which (full or limited) property may be appropriated, acquired or maintained. The character of *right*s and of *obligations* are relative and variable, with respect to rights to property (more secure or less secure), the obligations of right holders (weaker or stronger), and of sanctioning mechanisms (wide or narrow jurisdictions). Property rights may also be contingent upon a specific social status and the fulfilment of corresponding *duties*. Theoretical rights may also require some negotiation and a process of decision-making before they can be converted into rights that can be acted upon.

The bundle metaphor is useful here in at least four different ways, which I illustrate with several examples. At the broadest level, the bundle metaphor attempts to capture analytically the *total range of rights,* the potential totality of "sticks in the bundle"

that can be distributed over different holders of rights and obligations.[8] One example is the potential communitarian and commercial interests considered valid with respect to the genetic stock of a staple plant variety (rice, potato, corn, wheat). These sticks (rights and obligations) comprise not only access to the valuable (in the form of seed stock) and to a variety of uses (as at the farm level), but also the management of the valuable (as in agricultural research labs), the (legal institutional) possibilities of transfer and inheritance, and the political or religious (legislative) authority to regulate and decide on (seed) distribution and associated (farmers') rights and responsibilities. In all societies a distinction is made between rights to regulate, supervise, represent in outside relations, and allocate property on the one hand, and rights to use and exploit economically property objects on the other.[9] Many have conflated this distinction into two separate types of loci for property rights, the public (often seen in 'Leviathan' terms as 'the state') and the private (often seen only to apply to the individual). In fact, most property rights have both public and private domain aspects.[10] These two loci have become dualized with each being seen as a solution for the shortcomings of the other. The debate seems to be one in which private property is viewed as a brake on the worst excesses of the legislators, while public rights are seen as a brake on the worst excesses of private owners. For example, the control and management rights to genetic resources might be vested in the highest political authority

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[8] Examples of scholars who have attempted to delineate the possible total range of rights in a valuable include Bromley 1989 and Schlager and Ostrom 1992.

[9] Gluckman called these two levels "estates of administration" and "estates of production" (1972:89).

[10] See Weintraub (1997), Geisler and Daneker (2000), F. von Benda-Beckmann (2000) on the multiple and quite divergent meanings embedded in the terms 'public' and 'private'. See also C. Rose (2003), who notes the complex constellation of types of 'public' interests inherited from Roman law, and also expands on their 'private' face. In the case of *res publica*, for example, found primarily in physical spaces required for mobility such as navigational waterways, roads, the internet, these spaces are actually the "backbone of commerce." This argument may also be made for agricultural genetic stock, which under conditions of freely distributed public research can generated huge agricultural growth in the private sector.

in order to protect wide accessibility at the level of the user. But would this outcome logically follow? One suggestion for an alternative to TRIPS, for example, is sui generis laws in Less Developed Countries that would impose 'prior informed consent' on researchers employing genetic stock accessed from LDCs (Plahe and Nyland 2003). This might work if national authorities could be trusted to always act in the best interest of all of the members of society, something that many commentators ask leave to doubt. There is also the problem of the many levels of 'public' authorities who could demand some level of administrative control, some well recognized and some highly contested but functioning well in their own setting. Many such authorities demand some degree of control over how life will be commodified or made available for a broader human benefit, or how the environment and biological diversity will be protected (Kirsch 2001, Orlove and Brush 1996, Pálsson and Hardardóttir 2002). The question is further complicated by the fact that actual use may diverge quite sharply from those ideal principles enacted by such administrators.

The second use of the bundle of rights metaphor illuminates specific property categories (however legally elaborated), such as private property ownership or inherited lineage property, by viewing these categories as representing a bundle of rights in themselves. In most legal regimes, there are "master categories" that encapsulate the range of rights bundled into each separate property category. In Canada, for example, master categories of rights applied to land include private property (which can be owned by individuals, by corporate groups and even by a government agency), public or "Crown" lands, lands held in the public trust, timber leases, mining concessions, aboriginal reserves,

municipal land, national parks and others.[11] But remember too that among these are forms in which lesser, conditional and temporary rights have been derived from more encompassing forms (i.e. leases, rentals, concessions). These rights are not always easy to lump into private and public categories. The problem is even more difficult when applied to the parts that have been increasingly abstracted from a whole. To return to the crop variety example used above, an individual farmer in Mexico might assume that he/she holds a particular category of rights in their own bean seed (as private property) based on their own local legal regime, with associated rights to give seed to neighboring farmers or to sell their crop across the border in the United States. However, from the perspective of another legal regime, the bundle here may look very different. The holder of such bean seeds may have few or no rights, since many or most of the economic use rights have been recognized under U.S. patent law to be held by PODners, a company which has patented the bean variety, a claim challenged by the Center for International Tropical Agriculture, the Mexican government and others (Magnus 2002).[12] Such cases illuminate how property rights (and the contests over them) may not only be derived from legal regulations of the private domain but also of the public domain, especially when dealing with new forms of property.[13]

The third use of the bundle metaphor is to illustrate how the total property interests held by a single person (or other property holding unit) will form a bundle comprised of quite different kinds of property rights. He or she may own a house, private

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[11] For a master list of "protected areas", see Orlove and Brush 1996:332.
[12] Residual and provisional rights are relative notions. A provisional property relation is provisional only in relation to the residual one from which it is derived, and itself is residual in relation to other rights. One of the more interesting features of the patenting life debate is who has rights in this new valuable or set of valuables, and which rights are superior and which are derivative?
[13] For an early critique of "new" forms of property see Reich 1964. See also Wiber 1995.

land, financial holdings, pawned land, agricultural seed and animals, some component of lineage property including fruit from selected trees, rights to extract from a common resource, and units of water from a collective irrigation system. This use of the bundle metaphor allows us to examine the ways in which a single person or property holder's rights can form interacting sets, with implications for the uses and exchange value of any one piece of the total property in which they have rights. Consider an international corporation, for example, that seeks to acquire rights to potentially useful plant genetics, while at the same time owning plant varieties developed at their research farms, the laboratories that do genetic testing, the genetic patents and process patents that emerge from the lab research, the databases that place the results in a broader genetic context, the patents for herbicides and pesticides used in agriculture, commercial seed outlets, and even a scientific publishing house. This highly concentrated "ownership" of rights in particular kinds of objects, processes and outcomes, requires new levels of analysis to identify consequences for others, who may argue to protect academic freedom, public interest in crop seed biodiversity, or any other of a long list of potential values. Here the legal pluralism concept can help us identify overlapping social fields that would confer these property rights to different domains, highlighting areas of conflict and assertion of one system against other competing ones.

The fourth way to use the bundle metaphor is to examine the rights that have accreted to a given property object. In many cases, the rights accreting to an object are adjudicated under a single system of law – in other words, if I own a house and you rent it from me, our common legal system is able to sort out our respective rights and responsibilities. But what happens when you cross boundaries of legal regimes? Consider, for example, a DNA test based on two genes (BRCA1 and BRCA2) that helps

to predict the risk of developing breast cancer (see special issue of New Internationalist 2002: 25, Godrej 2002). Myriad Genetics, a Utah-based biotechnology company, first patented the test, and then placed over 25 patents on these two genes, and the proteins related to them, attempting thereby to limit any further medical uses. They argue that testing for these genes must be done through their labs, regardless of where in the world the patient is located. European labs are boycotting Myriad and flout the patents by continuing to test for the genes. The French government is mounting a legal challenge of the patents in the European Patent Office. If we consider BRCA1 and BRCA2 as individual property objects, we can investigate that total package of rights claims that have accreted to them as a result of the process of their discovery, their presence in thousands of individual women, their documentation, patenting and use in medical testing, and their objectification in different legal regimes. Here the bundle metaphor is able to expose the conflicting legal regimes concerned with one property object, as well as the different ways that rights are defined under these different legal regimes.

With the help of the bundle metaphor, then, one can arrive at a differentiated description and comparison of the different aspects of property relationships in patenting life. It shows that the four conventional property categories -- open access resources, private individual ownership, common/communal property, state/public ownership -- are not useful analytical guides nor sufficient descriptive categories for dealing with the complexity of bundled property rights involved in such new forms of property.[14] The bundle typology also suggests that property categories, such as individual or state ownership, are often theorized in Western scholarship without paying sufficient attention

[14] For a detailed critique of the Big Four, see F. von Benda-Beckmann 2001.

to the range of other rights pertaining to the property object in question.[15] In particular, property rights tend to be thought of solely in relation to the realm of the private domain, disregarding the public rights pertaining to such property. Private property is also usually identified with private individual ownership, ignoring the very real differences when the user is an individual, a joint or communal owner, or member of a group, association, or corporation. Secondly, because of the preoccupation with ownership rights, a wide variety of individual rights others may hold in property objects are downplayed, such as rights of tenants, of holders of a mortgage, of marital partners, or of licenses and concessions. These rights also may be held individually, or in various forms of group property or as state property. In the category of common or communal property, furthermore, radically different mixes of rights of individuals, and of smaller and larger social groups are thrown together into one theoretical category.

BUNDLES AND THEIR SYSTEMIC EMBEDDEDNESS

We can apply the concept of bundles also to the systemic incorporation and embeddedness of property in the wider political, social and economic organization. At the level of theoretical property relations, property law is just one part of wider, more encompassing sets of organizational and legitimatory structures and institutions. Thus, property is "systemic" in a number of different ways. For example, it is a part of a larger interdependent assemblage of legal ideas and practices, as in the fact that property law is part of a wider set of law that also is constitutive for property. Property relations may be structured by property law, tax law, environmental law, family law, and corporate law, to

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[15] C. Rose (1998a) discusses how much of the complex dogmatic aspects of property law are a response to these real complexities.

name but a few. At another level of system organization, each single form of property comes as part of a complex of property forms. For example, the much debated tragedy of the commons can only be understood in relation to private individual property in the form of cattle that graze on the land. Furthermore, property is typically multifunctional. For example, a particular plant variety may not only have economic value as a subsistence crop, but may also be thought to contribute to social security, have a religious value, and be important for ethnic identification, as with many maize varieties in the Mexican uplands. And property is typically linked with and made useful through a number of other institutions, including market, transportation, educational and public health, among others. Alexander (in press) has shown how this systemic nature of property has turned large parts of former socialist states into economic wastelands, as a factory here or a retail outlet there was privatized, while the rest of the infrastructure fell into collapse, rendering the new private property profitless and depriving the workers of many social services that used to be part of the socialist industrial complex. Moreover, in many societies there is a plurality of normative orders such that each establishes their own property regime with their own specific property categories and institutional backing. Further, these usually have many important interconnections, one with the other (see Wiber 1991, F. von Benda-Beckmann 1992, F. and K. von Benda-Beckmann 1994, K. von Benda-Beckmann 1981, 1984).

The degrees of interdependence will vary in such systems of which property is a part. While legal institutional orders are rarely fully systematized to the extent claimed in contemporary European legal ideology, changes in other parts of the legal order often spill over into property law, or changes in property law may be constrained by the structure of the wider order (see K. von Benda-Beckmann 2003). For example, change in

family law will affect property rights, as changes in women's property rights may be constrained by the overall position of women in society. Many societies have undergone change in the balance of property rights between individuals, groups and the public sphere which affect the entire system of property rights. In similar fashion, the actual uses to which property is put are often constrained or enabled by the economic and political institutions in which property is embedded. At the ideological level, this systemic nature of property is often forgotten and one property form is promoted over another without reference to these interactions. Debates about desired property regimes often neglect the systemic character of property at the behavioral level and remain at the layer of ideology.

In everyday dealings with property and especially in disputes, property ideologies and legal rules provide a repertoire of social resources through which people can rationalize and justify their interpretations of current property conditions or claims for change. But the kind of social relationships that interacting parties are involved in, the range of property held, and the nature of the concrete embeddedness of property relationships may have a much stronger influence on people's dealings with property than property rules and types of rights. Poor people who hold only provisional and temporary rights, e.g. as a tenant, in a property object owned by someone else, have different options and are likely to act differently from rich persons holding a variety of property rights. The point here is that while property interactions maintain (or change or create new) social relationships, the maintenance or change are also outcomes of wider interactions with wider intended and unintended consequences. This will be no less true of intellectual property rights and other "add and stir" property solutions to new kinds of

natural resource management issues, whether retaining biodiversity or indigenous/local knowledge, promoting economic growth, or solving food security problems.

5. PROPERTY AND CHANGE

In an opening vignette to an otherwise insightful article, Carol M. Rose (2003) compares people who try to develop intellectual property to poor villagers in India. They put effort and time into developing small but productive properties, only to have the wild tiger or rogue elephant of the public domain trample them or eat them up. In extreme cases, intellectual property "villages" are abandoned and left to "the jungle" of public property. But Rose neglects another part of the story, and that is that the villagers are also hungry, and while they do not directly consume tigers, they can consume much of the environment a tiger needs to survive. She also ignores the fact that some tigers have a lot of support from well-endowed international NGOs, while the villagers have the high moral ground of "custom immemorial". In many settings, the legal regimes that endorse/discount property claims are numerous, much as are the demands to any particular property object. Further, if one recognizes the implications of legal pluralism, both private and public property categories appear to be increasingly voracious, dualistic and universalizing property types. In recent exports of western property approaches, the private and the public forms of property each grow and expand by trying to 'eating the other up'.[16] While the process is particularly obvious in examples of 'new forms of

[16] Recent examples are expansive contests about the proper locus for property rights for many kinds of "new" property. Macinko and Bromley (2002) have produced a glossy publication encouraging public stewardship of America's fisheries (through limited term auctions) rather than "private fishing rights". Magnus, Caplan and McGee (2002) explore public versus private ownership in "life". And Drahos and Braithwaite (2002) debate public versus corporate ownership of the knowledge economy. The university campus is another setting for this debate. Who should own "education" (see Turk 2000)?

property' which create considerable anxiety, another locus of debate involves the environment and biodiversity (Rose 1998b, 1999). What objects should be property (particularly given the commercial focus of intellectual property law)? Should we allow patents on major food crop genomes? Or on the human genome? Or on potential pharmaceutical bonanzas? What kinds of social entities should ideally hold the rights in such properties (private, communal, state)? What kinds of rights should be involved (especially given arguments over externalities, transaction costs, economic growth, ecological sustainability)? Can we respect the rights of all relevant stakeholders? Does property law give us the flexibility to resolve these questions? And according to which property law? Economists, ecologists, lawyers, anthropologists and sociologists are involved in these debates and increasingly they influence each other's thinking.[17] But the view from 'outside' is often quite different. Western property theory promotes a dualistic game of voracious property types, public eating up private and vice versa. In exporting this game world wide (TRIPS, privatization, vs. common heritage, public interest), many other more balanced approaches to property (which fall between the public/private divide) are being consumed as well (as in kin group corporate property, farmers' rights, cultural property rights). I would suggest that such voracious property forms are harmful for biodiversity in both their extremes, primarily because they ignore both the systemic and the deep complexity of real property arrangements.

The model I have discussed illustrates that ideologies, legal institutions and actual property relationships are different factors necessary to the analysis of property practices. It

[17] For example, Rose (1998a) notes a recent shift in legal property textbooks such that the most popular approach has shifted from a doctrinal to a 'utilitarian' explanation for property rights, largely drawn from economic theory.

also suggests that these property aspects cannot be reduced to each other because all are conditions for constraining and enabling property practices. This is especially important for the analysis of the actual and imputed economic or ecological significance of certain types of property relations and processes of change.

If the distinction between ideological and actual property relations is not problematized, it will be difficult to analyze their potential interrelations. It becomes difficult to explore, for instance, whether certain types of property rights are likely to lead to concentration and accumulation of property by a few or to a relatively secure access to resources for the many,[18] whether they will have stronger or lesser functions for social and economic security,[19] or whether they are likely to lead to more or less sustainable resource use.[20] The von Benda-Beckmanns and I have argued that in most writings on the relationships between property and economic growth or ecological sustainability, *categories of property rights* are taken to affect resource allocation or sustainability of natural resources directly, while actual (and often highly contested) property relationships remain largely unnoticed.[21] In fact, what seems to be an outcome of rules and categorical property rights may be a result of the specific set of property relationships people are involved in and of the various kinds of property they hold, or even of the contests between property regimes to achieve dominance within a single social setting. It goes beyond the scope of this paper to attempt a comprehensive analysis of the relations between ideological and actual property relations and various utilitarian goals (economic or environmental). It also goes beyond

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[18] See Peters 2002, Wiber 2000, Wiber and Kearney 1996.
[19] F. von Benda-Beckmann 1990.
[20] See e.g. Feder and Feeny 1993:241.
[21] When the embeddedness of property relations is the focus, however, attention is usually on the embeddedness of the property relation *in* other types of social relationships, and the embeddedness of theoretical property rights in the legal (or ideological) bodies is neglected.

the scope of this paper to demonstrate the many ways that legal pluralism is affecting the real property relations people are actually involved in. I only want to point out that a clear association or congruence cannot be assumed between western categories of property *considered* dominant in property ideology, and sets of actual property relationships and their significance to a given historical period or economic/environmental outcome.

6. CONCLUSIONS

Paying attention to the systemic nature of property and to the contexts in which property relationships and property practices are embedded allows one to study property change in its context "from the ground up", and without assuming too much about how legislative changes will affect behavior (as in whether private or public ownership is "best"). Interestingly enough, a deeper understanding of property also contributes to the question: in what respects are the new properties really new? Expanding state powers that encroach on the entitlements of property holders is not new, but there are new types of objects that result, such as fishing quota or human genome databases. State regulation can create new property simply because people begin to use and dispute these instruments of state regulation *as* property or as infringing on property rights. In fact, partitioning off parts of what used to fall under an older bundle of ownership (as in creating patent rights in important food crops) has a long tradition – consider British common law and the wasteland debate in British colonies. Patenting life is an extreme example, and an example that has deep emotional underpinnings. But as the von Benda-Beckmanns and I have pointed out, much of the partitioning that took place in colonial

forests and wastelands had very similar emotional repercussions for those newly excluded. The systemic view of property allows us to see how changes in property are not one-way processes. Change may be initiated at any specific layer, and that change then typically feeds back into other layers, leading to many subsequent adjustments not always easy to predict. Any attempt to better understand these loops of influence must begin with a more sophisticated tool kit for understanding property regimes and their wider contexts. Only then can we begin to understand the relationship between specific property categories and political, economic, or ecological change.

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