

# Deconstructing Global Intellectual Property Rights Regimes over Biodiversity

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## 생물다양성과 지적재산권, 그리고 국제통상에 관한 지리학적 고찰

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**Abstract** : During the 1986-1994 Uruguay Round negotiations under the General Agreement on Trade and Tariffs (later World Trade Organization), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was adopted by participating countries. TRIPS has not only allowed intellectual property to be introduced into international trade arenas, but also extended the scope of protection to biodiversity such as plant genetic material, arguing that intellectual property rights (IPRs) would help conserve biodiversity. In this paper, I aim to deconstruct the global IPRs regimes over biodiversity by adopting geographers' sensitivity to place and scale as an analytical window. By investigating how all the issues regarding IPRs over biodiversity that are raised by diverse disciplines, such as environmental ethics, environmental economics and political economy approach, are scale-related, I demonstrate how biodiversity IPRs, and its introduction into international trade agreements, though separate issues with no inevitable relationship to one another, have been put together for the construction of global IPRs regimes. I argue that the notion on the construction of scale (i.e., rhetorical and discursive construct of globalization) can contribute to revealing how fragile global environmental conservation regimes are.

Key words: biodiversity, globalization, intellectual property rights, conservation, trade

**요약** : 무역과 관세에 관한 일반협정의 우루과이 라운드 교섭 하에 통과된 '무역관련 지적재산권에 관한 협정'은 지적재산권을 국제 통상 분야에 도입시켰을 뿐만 아니라 지적재산권의 대상을 생물다양성까지 확장시켰다는 중요성을 가진다. 본 연구는 지리학적 관점(장소와 스케일의 중요성)이 생물다양성과 지적재산권에 관련된 다양한 이슈들을 분석하는데 있어 얼마나 중요성을 가지며, 환경윤리학, 환경경제학, 정치경제학과 같은 다른 학문분야의 접근방법을 통합하고 보완하는지 고찰하였다. 자연, 인문현상의 지역적 차이와 다양한 스케일을 중요시하는 지리학적 관점은 개별적 이슈들로 인식되고 다루어져 왔던 생물다양성, 지적재산권, 이의 국제 통상기구에의 도입이 어떻게 임의적으로 관련지어졌는지 밝혀내는데 공헌한다.

**주요어** : 생물다양성, 세계화, 지적재산권, 환경보존무역

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## 1. Introduction

The growing challenges of transnational environmental degradation are often described as the destruction of “global public goods.” Such degradation includes climate change, loss of plant genetic resources and threats to endangered species, and has led to the emergence of hundreds of multilateral environmental agreements (MEA) such as the Montreal Protocol for atmospheric ozone, the Cartagena Protocol for biosafety, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) agreement. The global management of environmental problems through the establishment and application of standardized global norms or rules is based on the presumption that environmental problems have an overall impact on the whole globe across the nation states’ boundaries.

Reflecting and furthering the current trend of dealing with environmental problems internationally, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was adopted by participating countries during the 1986-1994 Uruguay Round negotiations under the General Agreement on Trade and Tariffs (GATT, later World Trade Organization). TRIPS has not only allowed intellectual property rights (IPRs) to be introduced into international trade arenas, but also extended the scope of intellectual property protection to biodiversity such as plant genetic materials. The argument is that the global implementation of IPRs would help conserve biodiversity. Furthermore, TRIPS intends to increase international trade by narrowing the differences in the extent of protection and enforcement of IPRs around the world, as well as conceiving and treating plant

genetic materials as global commodities.

In this paper, I examine how various academic disciplines have supported the global implementation of IPRs regime and how they have been challenged within the disciplines as well as from geographical perspectives. In particular, I focus on environmental ethics, environmental economics, and political economy. Since the application of IPRs to plant genetic resources is involved in conservation and economy, it is critical to examine how environmental ethics and environmental economics and law help support the global implementation of environmental regulations and policies, and how their justifications are problematic. Given that biodiversity is site-specific (i.e., different physical environments, cultural and social practices, and notions of biodiversity lead to different degrees and forms of biodiversity), I emphasize the need for sensitivity to geographical scale and place. Moreover, TRIPS has produced numerous contradictions and heated debates on the relationships among biodiversity, IPRs and conservation because these relate to the global North and South conflicts. Therefore, it is necessary to examine how political economists approach IPRs issues, and how their attention to differences between developed and developing countries helps to reveal the political and economic processes underlying the global implementation of IPRs over biodiversity.

More importantly, however, I argue that the global implementation of IPRs regime is neither an inevitable solution for global ecological degradation nor the outcome of the economic ‘logic’ as commonly presented. By adopting geographers’ sensitivity to place and scale as an analytical window, I examine how biodiversity, IPRs, and their introduction into international

trade agreements, which are separate issues with no inevitable relationship to one another, have been put together for the construction of a global IPRs regime. Critical human geographers' insight into the construction and politics of scale can contribute to an understanding of how the issues regarding IPRs to plant genetic resources are inherently related to geographic scale. This triad of ethics-economics-scale with respect to the global implementation of IPRs has been little examined, despite its importance for understanding the future of biodiversity. This paper fills this gap by exploring the relationships of these three components and emphasizing the importance of geographical perspectives in understanding the globalization of environmental regulations. I illustrate the relationships of environment ethics, environmental economics and political economy, and how geographical perspectives contribute to, and are situated in, the debate on global IPRs to plant genetic resources in Figure 1.

## 2. Environmental Ethics

### 1) Universalism and environmental ethics

Although environmentalism includes complicated and differentiated discourses and theories that have been constructed out of a variety of philosophical roots, social theories, and political positions, most environmental ethics have pursued certain normative grounds. Many normative environmental ethics have derived from some axiological 'centre' - sources of value - and exhibit paradoxical tension between human and nature (Proctor, 1998). For example, anthropocentrism is a human-centered philosophy that regards humans as the only beings with intrinsic or inherent values and rights. Thus everything else has only instrumental values derived from its usefulness to humans. On the other hand, nonanthropocentric theories are based on the idea that nature also has its own intrinsic value.<sup>1)</sup> For example, biocentrism and ecocentrism extend moral considerability, rights and values to all living creatures and ecosystems, respectively (Regan, 1982; Callicott, 1989)

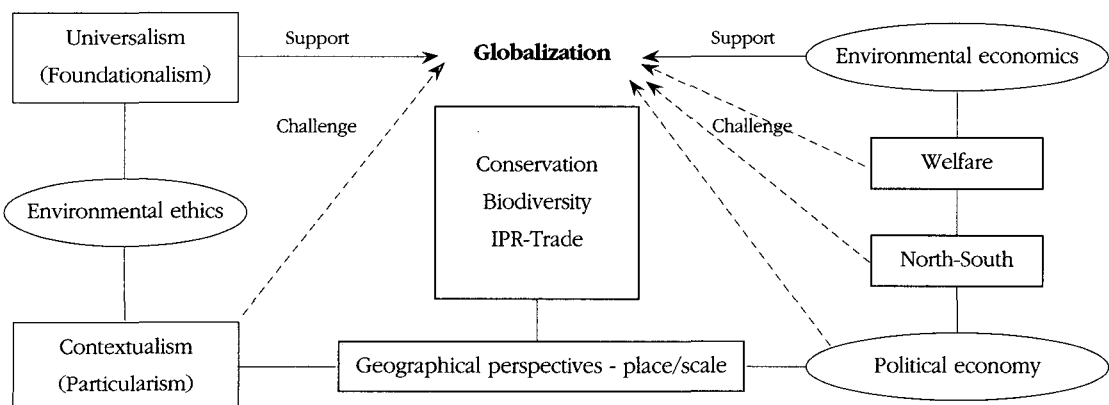


Figure 1. Relationships among disciplines in the debate of global IPRs

Moreover, there is a tension between universalism (foundationalism) and relativism (particularism) in the way in which environmental ethics examine the characteristics of ethical reasoning or systems of ethics. Universalists hold that there are absolute, eternal rules of right and wrong; thus, there are fundamental principles of ethics and morals that always and everywhere apply. Because universalist ethics negates any differences in terms of time and space, it is based on objectivist epistemologies in which something is understood to be independent of the knowing subject (Proctor, 1998). On the contrary, relativists hold that whether something is right or wrong depends on a site, situation and context. For example, 'postmodern' ethicists reject all grand narratives and universal philosophy, focusing on local and contingent knowledge. From a postmodern perspective, each of us has a different perception of nature depending on our cultural, historical, intellectual and experiential background (Cunningham, 1994). In other words, they are linked to subjectivist epistemologies that stress the active and potentially differentiated human role in constructing knowledge and value (Proctor, 1998) (Figure 2).

The pursuit of universalism (absolutism) is at

the core of the work by environmental philosophers. For instance, Michael Soule (1995), one of the fathers of Conservation Biology regards postmodernism as a greatest threat to nature and biodiversity. If the value and meaning of nature depends entirely on the perspective and interests of the viewer, policy makers who accept these postmodern myths might accommodate invasive or destructive practices (i.e., in danger of anthropocentrism). Indeed, universalists (foundationalists) in environmental ethics are common within nonanthropocentric theory, because they search for intrinsic value in nature and intend to establish immutable moral principles and formulate objective and 'law-like' ethical algorithms that do not change depending on human values (Minteer, 1998; Callicott, 1989; Rolston III, 1988). Although recent environmental ethics anthologies do include sections of non-western thought, they do not include any serious engagement with the question of relativism (Proctor, 1998).

This rooted ignorance toward relativism, subjectivism, and particularism in environmental ethics is linked to the application of universal environmental ethics to everywhere in the globe. Universalism or absolutism facilitates the

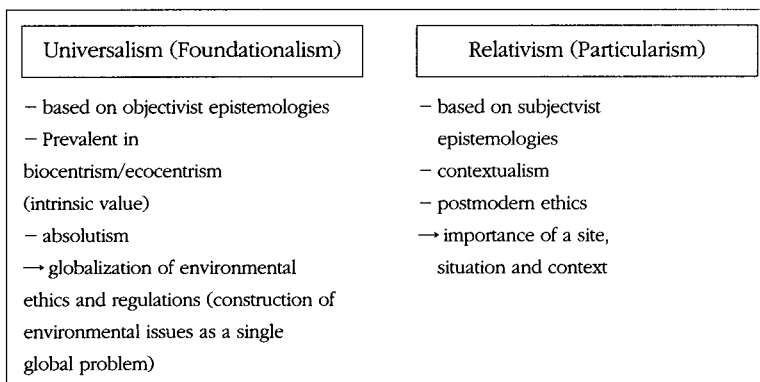


Figure 2. The systems of ethics

construction of environmental problems as a single global issue that requires all nation-states' participation under one standardized rule, regardless of their diverse views on nature and environmental ethics. Therefore, it justifies the establishment of global environmental regulations and institutions. Local environmental problems in this world view are often presented as fundamentally global problems with the metaphor of 'the global common heritage' mobilized as an antidote to ecological degradation (e.g., the atmospheric commons, the oceanic commons and the genetic commons). Since nature in the form of this 'global commons' has its own intrinsic value with objective and absolute value foundations that are applicable to all over the world, it is required that all nation-states accept its value and the policies it implies. Based on universalism, the global commons perspective favors top-down approaches in dealing with the conservation and use of natural resources, and emphasizes the need to develop global institutions staffed by technocrats and scientists to manage and solve these supposedly 'transboundary' environmental problems (Goldman, 1998, 3).

These universalistic approaches are problematic, however. Within the discipline of environmental ethics, the universalistic approaches have been challenged by many ethicists (Norton, 1987; Minter, 1998; Light, 1996). Despite its utility in calling global attention to ever increasing environmental crisis in recent years, universalism cannot easily be applicable when it comes to matters of specific environmental policy. Universalistic approach, based on basic philosophical foundations, cannot take into account of a variety of ecological conditions and complex human-environment interactions at local

levels. Simply to state, our reality - the plurality of human experience and complex biosocial variability - questions the applicability and legitimacy of universal environmental ethics and the global implementation of environmental regulations and policies. As Minter (1998) argues, the admission of a diversity of ecosystemic and cultural variables renders general demands for one moral justification moot. As an alternative, Minter claims that "environmental ethicists need to roll up their sleeves and dig into the layered and fertile soil of moral life, to abandon the ethical quest for certainty and the fixed moral maxims of foundationalist philosophy that have shut out the particular and contingent in favor of the general and absolute" (Minter, 1998, 344). By emphasizing contextualism, environmental management and policy can be sensitive to the complex and multi-scalar nature of ecological systems.

In short, although universalism prevalent in environmental ethics appears to underpin the global implementation of IPRs to plant genetic resources by framing it as a global conservation issue, it inherently has constraints in the face of complex local variability of ecological conditions and biosocial processes. This attention to local variability implies the demand for incorporating geographical perspective in environmental ethics.

## **2) Contextualism and geographical perspectives**

Resonating with this call for contextualism, geographers have explored how geography as a discipline and as reality could contribute to environmental ethics. By proposing "geoethics," Lynn (1999) insists on using geography's insight into the importance of context to avoid the major

pitfalls of analytic moral thought; universalism and relativism and the problematic grounds of the binary opposites; anthropocentrism and misanthropism. Since geographical perspectives have been exposed to and dealt with the paradoxical tensions between not only nature and human (culture) but also object and subject, geography can contribute to establishing a philosophical space for environmental ethics that takes paradox seriously and avoids its simplistic resolutions.

In contrast to ethical theories stressing rigorous deduction from unitary moral principles, Lynn (1999) argues that geoethics emphasizes a plurality of moral concepts situationally appropriate for a moral understanding of our world. In other words, geoethics recognizes a plurality of anthropofocused and non-anthropofocused values at multiple scales of existence and analysis. Lynn's notion of geoethics is correspondent to Proctor's emphasis on plurality of local situations. As Proctor (1998, 246) argues, any normative environmental ethics must be built on a differentiated sense of culture, local situations, and the differential responsibility of various human actors for environmental well-being that are all different according to regions, cultures, and ecosystems. In addition to plurality of local conditions, I argue that sensitivity to multiple scales should be a fundamental element of environmental ethics because environmental phenomena themselves are both outcomes and causes of the processes of and interactions between the environment and political and economic actors that operate across various scales.

### **3. Environmental Economics, Laws, and Policies**

#### **1) The Coase Theorem and the enclosure and conservation of plant genetic resources**

The application of IPRs to biological diversity, particularly plant genetic resources, has been discussed in terms of both the conservation and enclosure of these resources. Plant genetic resources have historically been considered and used as common resources. Therefore, plant genetic resources have not only their own intrinsic value as an object of conservation, but also use value in economic terms because they are fundamental input materials for agriculture and biotechnology. These economic and conservation aspects of plant genetic resources require an examination of environmental economics and studies of laws and policies because their perspectives are reflective of the justification for the global implementation of IPRs to these resources. In addition, I examine what problems are involved in the justification and implementation of global IPRs regime which are in part linked to critique by political economists.

While environmental ethics (universalism) implicitly provide a philosophical basis, although erroneous, for the global implementation of IPRs, mainstream environmental economics and studies of laws and policies explicitly support using property rights to solve environmental problems occurring at the international level as well as at the local level. Their justification for adopting property rights to solve environmental problems is based on the Coase Theorem (Coase 1988). In the Coase Theorem, environmental

problems related to common resources such as air, water, forest, and wildlife habitat are considered caused by competition between conflicting or alternative resource uses. Thus, property rights to the resource in question must be defined first. The party who values the resource most and offers the greatest compensation to the owner after negotiating with other parties will win the right to use the resource. With this reasoning, it is believed that environmental problems can be solved (Coase, 1960, quoted in Anderson and Grewell, 1999). In other words, people directly involved in competition for the resource benefit from developing property rights, and the tragedy of the commons is avoided through fair competition and negotiation (Anderson and Grewell, 1999, 101). However, the Coase Theorem applies only when there are no transaction costs (Zelder, 1997). Based on the Coase Theorem, moreover, Anderson and Grewell (1999) argue that an international rule of law would be the best solution for preventing the tragedy of the global commons and that, where transaction costs are prohibitive, top-down property rights rather than bottom-up property rights would be a secondbest solution.

In contrast to this supposition of environmental economists, however, the enclosure strategy has its own externalities. Establishing and maintaining private property rights are costly and they involve transaction costs. In contrast to those claiming that the Coase Theorem advocates private property policy, Coase (1988) actually criticizes and refines orthodox economic models, which have usually been based on the strange assumption that transaction costs are zero. Despite many misinterpretations of the Coase Theorem, Coase makes it clear that transaction costs are rarely close to zero, and in fact

sometimes transaction costs are so high that negotiations and contracts do not take place. Indeed, transaction costs to establish IPRs regimes over biodiversity are considered a main obstacle and burden to developing countries where property rights regimes have not been established.

The problem of transaction costs is also demonstrated in Janssen's(1999) comparative analysis of economic efficiency of two property rights regimes in biodiversity conservation: open access to genetic resources and private property rights. Exclusive private property rights over genetic resources are economically more efficient than open access in conservation, in that property rights regimes can compensate for those who bear the cost of conserving and providing genetic resources. They can also create economic incentives for the protection and provision of diverse genetic resources by inducing agents who want to use genetic resources to pay for access to them. However, property rights regimes cannot avoid transaction costs.

Besides transaction costs for the enforcement or transfer of private property rights, Janssen (1999) points out other externalities of IPRs; the application of private property rights to genetic resources, knowledge and information of biotechnology, creates monopolies that impose social costs. IPRs regimes would also increase competition for patents between biotechnology firms. In order to remedy these externalities of private property rights regimes, Janssen (1999) argue, policy instrument are necessary. Although Janssen tends to support private property rights, his analysis of the economic efficiency of the two regimes does not convincingly demonstrate the superiority of private property rights over open access. His analysis is based on economic

models without empirical evidences, and policies proposed as a solution to the externalities of property rights regimes are not specifically suggested.

The world is neither ideal nor perfect as economics supposes. A variety of other factors influence property rights, such as different characteristics of ecosystems, different economic development levels, different cultural and social contexts, and so forth. Therefore, in examining the legitimacy and efficacy of applying IPRs over biodiversity, it is necessary to have geographical sensitivity and pay attention to the various situations that each region, nation-state, and local area faces. Moreover, the enclosure of plant genetic resources is fundamentally a question about the 'scale' at which property rights over common resources are defined and the "legitimacy" of that scale. Common resources, as the concept indicates, do not belong to anybody as private property. Rather, they are open to use by every individual, community, nation-state, or whatever kind of entity the commons are defined for. How legitimate is a certain scale as a basis for the enclosure of these common resources then? Is the air above a certain place the property of a certain individual living in that place, a community found at that place, a nation-state whose sovereignty the place is under, or all global citizens? Who has a legitimate authority to define and grant property rights to common resources? There remain many complicated problems and issues to solve.

## **2) Intellectual property rights and welfare**

While Janssen (1999) focuses on the relations between IPRs and biodiversity conservation, and the externalities of IPRs, Frischtak (1993) pays

attention to the relations between IPRs and welfare. The attention to welfare poses a crucial question as to whom global IPRs regimes benefit. Frischtak suggests differentiation in the degree of IPRs protection according to the level of technological and productive competence of an individual country. He claims that there are few grounds in economic theory, in terms of either national or global welfare, for all countries to abide by uniform IPRs regimes nor to make them uniformly tight. He also asserts that "the fact that enforcement costs and budgetary constraints are different makes the convergence of intellectual property rights systems still less meaningful, at least from a social welfare standpoint" (Frischtak, 1993, 89-90).

From a global welfare perspective, it is hard to determine the optimal level of patent protections. Drawing on simulation results derived from the recent models examining the welfare economics of patent protection in North-South contexts, Frischtak (1993) argues that global welfare would not be increased by a uniform system. One of the simulations shows that as long as the South is a small part of the world market for goods subject to improvement, the lack of IPRs regimes in the South does not constitute a major disincentive to innovators, even if it leads to 'free riding' by appropriating the benefits of the North's research and development (R&D). Rather, this free riding by the South generally improves its welfare.

Moreover, if the technological preferences of southern consumers are significantly different from those of the North (i.e., if their needs are quite specific, in terms of disease-fighting drugs, for example), the welfare gains of the South may again outweigh income losses to northern firms (Diwan and Rodrik, 1989). Thus, the total global



welfare is increased. When most southern needs must be satisfied by innovations specifically targeting the South's preferences, it may even be in the interest of the South to have a stronger patent protection system than the North, so as to reward R&D efforts targeting smaller and less profitable markets. Therefore, in this case, the trade-off facing the South would be between free riding and stimulating such innovations (Diwan and Rodrik 1989).

Frischtak's (1992) work, together with Diwan and Rodrik's (1989) work, has significant implications for examining the justification of a uniform IPRs regime in terms of global welfare, since it provides for various possible situations of different countries, especially developing countries. Countries at different levels of development react differently to the application of IPRs, and may require alternative forms of protection and differentiated policies. However, Frischtak's work is limited by the fact that he only focuses on the technological development levels of developing countries rather than embracing other important differences and practices including cultural, social, and ecological.

To summarize, the examination of environmental economics indicates the need for paying attention to complexity of reality and cultural, technological and ecological differences among places which render the feasibility of global implementation of IPRs questionable. Although environmental economics propose to solve environmental problems related to common resources through the establishment of IPRs, it shows many externalities in contrast to its simple assumption. Moreover, the attention to the relationship between IPRs and welfare leads us to raise questions about who benefit through the global implementation of IPRs and the global

North-South dimension embedded in IPRs to biological diversity.

#### 4. Political Economy Approach to Intellectual Property Rights

The conservation and enclosure of plant genetic resources through IPRs entails global North-South dimensions. In contrast to a simplified world as postulated by economic models, our world is so complicated that the global implementation of IPRs brings about conflicts and inequalities between developed and developing countries. And it is necessary to examine how the attention of political economy to differences between developed and developing countries helps to reveal the political and economic processes underlying the global implementation of IPRs over biodiversity.

With more sensitivity to place, political economists pay attention to the inter-country differences that are at the core of major conflicts in international and bilateral forums regarding the use and ownership of plant genetic resources. While the geographical distribution of richness in biodiversity is mostly concentrated in developing countries, the geographical distribution of (bio)technology and patents owners is concentrated in developed countries. Moreover, in contrast to the western practices advocating private property rights, in most developing countries, biodiversity and biodiversity-related knowledge are shared and conserved by not an individual but a whole community such that the members of the community freely use their biodiversity and knowledge for producing their products and creating new plant varieties (Shiva *et al*, 1997).

These inter-country differences have led to major conflicts in international arenas, especially in the domains of food, chemicals, and pharmaceuticals. For example, while a number of developing countries have argued against the extension of IPRs into plant genetic resources due to the importance in fulfilling the 'basic needs' of the population, (bio)technology-related firms from developed countries consider the exclusion of biological products and processes from patentability as attempts to free ride and subtract from their profits. The community sharing of biodiversity in developing countries is prohibited under the western-oriented international IPRs regime. In order to reproduce their product next year, farmers should pay royalties again to the company that owns the patent of a certain seed.

Focusing on the practices of using and conserving biodiversity in developing countries, political economists also challenge the link between the western IPRs and biodiversity conservation. Shiva *et al.* (1997) propose "community intellectual rights (CIRs)" as an alternative to the western oriented IPRs for biodiversity conservation. They contrast two paradigms of biodiversity conservation: the bioprospecting model and the community rights model. While the bioprospecting model is usually held by transnational corporations that pursue profits by using biodiversity as an input for their products, the community rights model is held by communities that use local biodiversity for their survival and sustenance (Shiva *et al.*, 1997, 76). The fundamental difference between these two models is their view on the value of biodiversity. For the bioprospecting model, biodiversity is only a raw material for the production of commodities and profits (i.e.,

anthropocentric), while for the community rights model, biodiversity has intrinsic value as well as high use value (i.e., both anthropocentric and ecocentric). Hence, CIRs reflect the collective and community nature of indigenous biodiversity, biodiversity-related knowledge, and collective innovation that evolve over time and involve many people and generations (Shiva *et al.*, 1997, 55). Bioprospecting, however, puts priority on the acquisition of genetic resources and conservation of only selected genetic resources for future use.

Although bioprospecting monetarily compensates for indigenous efforts to conserve and provide biodiversity (and is thus considered more desirable than "biopiracy," in which biodiversity is stolen without any payment), biodiversity and biodiversity-related knowledge are considered valuable only when they are found worthy of western technology and put into the market through the investment of capital. Thus, Shiva *et al.* argue that "bioprospecting reduces biodiversity and centuries of farmers' and healers' knowledge derived through innovation to meet the needs of survival and sustainability rather than market needs, to a valueless raw resource, which can be transferred to corporations by any one community, individual or the state for a price" (Shiva *et al.*, 1997, 77). In other words, by valuing local biodiversity in relation to international markets and denominating biological resources in dollars, euros, or yen, IPRs over biodiversity abstract nature from its spatial and social contexts, and reinforces transnational corporations' claims to the greatest share of the earth's biomass, giving them more power to control biodiversity of the world (McAfee, 1999, 133).

Then, how has the uniform IPRs regime been

established in international arenas? Using the concept of hegemony developed by Gramsci to designate the success of a social group in defining its own particular interests as the interests of society as a whole, Purdue (1995) provides a critical insight into how the uniform IPRs regime was constructed to serve specific economic interests of the North. He argues that an agenda for the globalization of US-style IPRs - that is, the institutionalization of a globally uniform IPRs system through international organizations - is hegemonic because it is able to present itself as being for the general good, while serving particular industrial interests of the North including those of the biotechnology industry (Purdue, 1995, 99).

Although developed countries insist that the uniform IPRs regime benefit all by allowing developing countries increased market access to developed countries, there is asymmetry in the definition of IPRs over genetic resources. Whereas commercially developed seed varieties and genetic materials have been afforded IPR protection, indigenous seeds and landrace varieties, mostly found in developing countries contributing to the production of these commercial varieties and genetic materials, have been allowed to remain freely accessible as public goods (Mooney, 1983). This asymmetry favors the biotechnology industry mainly based in developed countries rather than small farmers and breeders in developing countries. Furthermore, an issue has been made of the patenting of 'discoveries' (i.e., the theft of exotic flora generated from purely accidental mutations and biopiracy of traditional cultivars and landraces in developing countries) because of patenting authorities' inability to complete any list of all variations existing in nature in order to determine

the novelty and distinctiveness of a certain variety (Mooney, 1983).

Purdue (1995) also calls attention to the arbitrary way in which IPRs have been introduced into international trade agreements (e.g., the GATT/WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)). He argues that IPRs and (free) trade have been completely separate issues with no logical connection. IPRs, far from expanding trade, are trade barriers inasmuch as IPR holders are given monopoly import privileges. In other words, they intervene in and distort the free market because they can restrict the number of people who could otherwise freely make, use, sell or import the protected products and processes, and enable owners to avoid a situation where the price of their products or processes is driven down towards the marginal cost of reproduction (Crucible Group, 1994). When developed countries brought the IPRs issue into GATT, however, they blurred the disguised market distortion and protectionist aspect of IPRs, and insisted that they were all trade-related (e.g., international trade in counterfeit goods) (Raghavan, 1990). Moreover, developed countries maintained that varied extents of protection and enforcement of IPRs around the world were one of the most significant barriers to trade and to technology transfer. In addition to the arbitrary connection made by developed countries between IPRs and trade, TRIPS improved the negotiating position of developed countries in debates on IPRs to biodiversity, and provided a favorable environment to transnational corporations by imposing trade sanctions on countries not complying with its provisions (Pistorius and Wijk, 1999; Frisvold and Condon, 1998).

As research conducted by political economists indicates, the culturally biased, individual focused and narrow notions of property rights that have shaped the current global IPRs regime are inappropriate for indigenous cultures based on a community, conservation of biodiversity, and cultural and social diversity. The institutionalization of this western based IPRs to biodiversity reinforces the monopoly over global biodiversity and food systems by a small number of transnational corporations. In short, with more sensitivity to inter-country differences, political economists provide the incisive explanations of economic and political inequalities between developed and developing countries regarding the global IPRs regime.

## **5. Geographical Perspective: Place and Scale**

I examined how different disciplines have approached the issue of the global IPRs regime to biodiversity (i.e., plant genetic resources), and what weaknesses have been found in their justification for the uniform IPRs regime. The weaknesses pointed out within the disciplines are highly related to the ignorance of complexity and differences of each place, thus demanding geographical perspectives as an important analytical tool. Geographers understand place as the local characterized by unique site and situational endowments, and also as contexts embedded in particular social, cultural and historical circumstances. Each place, moreover, has varying ecological conditions and complex human-environment interactions. Each place, therefore, has developed its own perspectives and values on, and unique ways of using and

conserving, its environment and natural resources. Together with these cultural and ecosystemic variables, the consideration of different levels of technological and economic development among different regions, nation-states, and local areas resonates the importance of geographical sensitivity in the debates on the application of the globally uniform IPR regime.

Furthermore, critical human geographers' insight into scale helps us understand how the scale of the global has been socially constructed as a scale at which IPRs should be applied and biological diversity should be managed. In other words, the globalization of IPRs regimes is not an inevitable outcome or end point of economic 'logic' or biodiversity conservation as it has commonly been represented.

Critical human geographers have been paying theoretical and empirical attention to how scales are produced and strategically used in the context of changes in global-local relations in the era of globalization (Leitner, 2004; 1997; Swyngedow, 1997; Smith, 1992; Herod, 1997; 1998). The common agreement about scale among them is that scale is socially constructed rather than a fixed and ontologically pre-given platform as the traditional Euclidian and Cartesian notions of geographical scales. The construction of scale is a highly contested process, involving numerous negotiations and struggles to reshape the spatiality of power (Leitner, 2004). The early works on scale by Marxist geographers mostly focus on theorizing the production of scale in terms of the internal contradictions of capitalism. Based on Harvey (1982; 1989) and Lefbvre (1974), this approach insists that operations of capitalism have inevitably produced particular sets of scale configuration, namely scalar fix. In other words,

scales are produced in a way that is involved in the capital accumulation and circulation (Smith, 1992). As such, this approach revolves around globalization thesis, and attempts to explicate rescaling or jumping scale as an outcome of global capitalist restructuring. For instance, Smith argues that in practice, capital's strategy to avoid and supersede "historically established mechanisms and territories of social control" involves not the extinction of place per se but "the reinvention of place at a different scale - a capital-centered jumping of scale" (Smith, 1996, 72). More recent works expand their emphasis to modes of regulation and institutional forms beyond capital (Swyngedouw, 1997, 2000), and point out the existence of other actors than capital in the production of scale (Herod, 1997, 1998; Leitner, 1997; Brenner, 1997, 1999; Agnew, 1997).

This theorization of scale in geography contributes to understanding how property rights extended to biodiversity, previously non-capitalist realm that was freely exchanged as common resources. The global IPRs regime is reinforced by the construction of the global as a scale at which environmental problems should be managed. The justification for global management of environmental problems is the overall impact that environmental problems have on the whole globe across the boundaries of nation states. This notion about the cross national impact of environmental problems is critical in establishing the global regulations in order to keep the environment from further deterioration. However, using the global scale as the one at which the environment should be regulated is a social construction rather than an inevitable reality. For example, global climate change has been born of paranoid hype by environmental

pressure groups but unproven by any solid fact or independently verifiable scientific observation of actual anthropogenic climate change (Demerit, 1998).

Likewise, it is necessary to pay attention to the constructivist aspects of biodiversity, IPRs, and trade. Far from providing solid foundations for particular regimes or discourses, biodiversity, IPRs and trade are highly contested with respect to their definitions and relations to one another. Indeed, competing concepts of biodiversity have emerged varying from 'the variety of organisms at all levels' to 'genetically coded functions' (Purdue, 1995). While the entire organisms were conceived as an object of conservation, the gene has been increasingly considered as important biodiversity to maintain. In other words, the scale of the gene is produced for biodiversity conservation.

Moreover, the recent development of biotechnology has facilitated the notion of genetic resources as a global commodity for both inputs for the production of new products and outputs (e.g., new varieties of seed). As the scale of the gene is produced for the commodification of biodiversity, the term 'biodiversity' has slipped out of the control of ecologists, conservation community and grassroots social movements and into the hands of economists, to become comparable with the intellectual property demands of the biotechnology industry.

This conception of biodiversity as commodity provides a basis for conserving economically important genetic resources, but it is hard to justify the conservation of non-marketable genetic resources and traditional biodiversity-related knowledge that serve for indigenous people's sustenance. However, the biotechnology industry universalizes the claims made by

biotechnology companies that their ownership of life forms is somehow in the public interest and the extension of IPRs to plant genetic resources would ensure the production of new varieties of plants as well as the conservation of these resources. This social institutional constructivism explains how the social power of the biotechnology industry leads to the global implementation of IPRs regimes.

In this sense, the global implementation of uniform IPR regimes is understood in terms of the construction of the global scale. The global scale as a scale for conservation and commodification of biodiversity is not an outcome of disembodied 'logic' of markets and conservation, but is rather an outcome of rhetorical and discursive constructs, practices and ideologies of economic and political actors.

## 6. Conclusion

This paper has examined how various disciplines approach the global implementation of intellectual property rights to biodiversity, and has shown how the issues raised by these disciplines are inherently place- and scale-related. Although environmental ethics, environmental economics and legal perspectives generally support the global implementation of intellectual property rights to biodiversity, they have also raised the limitations of, and questioned the legitimacy of, the global implementation of intellectual property rights. In environmental ethics, ecocentrism that has had a great impact on that discipline is criticized for its foundationalism by those who turn their attention to the diverse ecosystems, cultures and contexts. Minter's (1998) contextualism against founda-

tionalism undermines the global environmental regulations. Although intellectual property rights to biodiversity are supported by environmental economists, transaction costs are an unavoidable problem in their implementation. Furthermore, the uniform application of intellectual property rights into every country is not supported by the welfare aspect, since intellectual property rights will not necessarily increase overall welfare of the world (Frischtak, 1993). Political economists have contributed their efforts to revealing economic and political interests of the North in the global implementation of intellectual property rights, which reinforce the North-South inequity.

The geographical notion on the scalar politics of globalization provides a more nuanced understanding of how rhetorical and discursive constructs of globalization are involved in the global implementation of intellectual property rights regime. However, what is the implication of adopting geographical notions of the construction of scale in understanding the global implantation of IPRs to biodiversity? I argue that critical geographers' insight into the construction of scale provides positive potential for a more progressive kind of globalization in response to neoliberal globalization. Developing countries can use globalization for connecting with other regions or countries in order to resist the uniform intellectual property rights regime and establish property rights regimes appropriate to their unique economic, social, and ecological situations. The following argument from Kelly (1999) provides a critical insight into the discourse about globalization and production of scale:

Globalization, then, need not simply mean the globalization of a particular model of economic

and social policy. If instead it is taken to be simply a process of extensification and intensification of social connectedness across space, rather than a normative and inevitable end-state, then it can be interpreted as either progressive or regressive (or somewhere in between), depending upon how such processes are harnessed and used (Kelly 1999: 385-6).

### Note

There are other, more nuanced, positions such as ecofeminism and ecosocialism, but this paper confines the discussion to these two opposing environmental ethics.

### References

- Agnew, J., 1997, The dramaturgy of horizons: Geographical scale in the 'Reconstruction of Italy' by the new Italian *political parties*, 1992-95, *Political Geography*, 16(2), 99-121.
- Anderson, T. L. and J. B. Grewell, 1999, Property rights solutions for the global commons: bottom-up or top-down? *Duke Environmental Law & Policy Forum*, 10, 73-101.
- Brenner, N., 1999, Beyond state-centrism? Space, territoriality, and geographical scale in globalization studies, *Theory and Society*, 28(1), 39-78.
- Brenner, N., 1997, State territorial restructuring and the production of spatial scale: urban and regional planning in the Federal Republic of Germany, 1960-1990, *Political Geography*, 16, 273-306.
- Callicott, J. B., 1989, *In Defense of the Land Ethic*, Albany: State University of New York Press.
- Coase, R. H., 1988, *The Firm, the Market, and the Law*, Chicago and London: The University of Chicago Press.
- Crucible Group, 1994, *People, plants, and patents: the impact of intellectual property on biodiversity, conservation, trade, and rural society*, International Development Centre, Ottawa, Canada.
- Cunningham, W.P., 1994, *Understanding our environment: an introduction*, Dubuque, Iowa: Wm. C. Brown Publishers.
- Demeritt, D. 1998, B. Braun and N. Castree(eds.), Science, social constructivism and nature, in *Remaking Reality: Nature at the End of the Millennium*, 179-193, London and New York: Routledge.
- Diwan, I. and D. Rodrik, 1989, Patents, Appropriate Technology, and North-South Trade, Washington, D.C.: *World Bank PPR Working Papers 251*.
- Dutfield, G., 2000, *Intellectual property rights, trade and biodiversity: seeds and plant varieties*, London: Earthscan.
- Frischtak, C. R., 1993, Harmonization versus differentiation in intellectual property right regimes, in M. B. Wallerstein (ed.), *Global dimension of intellectual property rights in science and technology*, National Academy Press, 89-106.
- Frisvold, G. B. and P. T. Condon, 1998, The Convention on Biological Diversity and Agriculture: Implications and Unresolved Debates, *World Development*, 26(4), 551-70.
- Gadgil, M. and G. Utkarsh, 1999, Intellectual property rights and agricultural technology: linking the micro- and the macro - scales, *Indian Journal of Agricultural Economics*, 53(3), 327-341.
- Goldman, M., 1998, Introduction: the political resurgence of the commons, in M. Glodman (ed.) *Privatizing Nature*, 1-9, New Brunswick: Rutgers University Press.
- Herod, A., 1997, Labor's spatial praxis and the geography of contract bargaining in the US east coast longshore industry, *Political Geography*, 16, 145-69.
- Herod, A., 1998, Of blocs, flows and networks: The end of the Cold War, cyberspace, and the geoeconomics of organized at the *fin de millenaire*", in A. Herod, G. O Tuathail and S.

- Roberts(eds.), *An Unruly World? Globalization, Governance and Geography*, 162-95, London: Routledge.
- Janssen, J., 1999, Property rights on genetic resources: economic issues, *Global Environmental Change*, 9, 313-321.
- Kelly, P., 1999, The geographies and politics of globalization, *Progress in Human Geography*, 23 (3), 379-400.
- Leitner, H., 1997. Reconfiguring the spatiality of power: the construction of a supranational migration framework for the European Union. *Political Geography*, 15(2), 123-143.
- Leitner, H., 2004, The politics of scale and networks of spatial connectivity: transnational interurban networks and the rescaling of political governance in Europe. in E. Sheppard and R. McMaster (eds.), *Scale and geographic inquiry: nature, society, and method*, Blackwell: Malden, MA, 236-55.
- Lewontin, R., 2000, *The triple helix: gene, organism, and environment*, Cambridge, MA: Harvard University Press.
- Light, A., 1996, Callicott and Naess on pluralism, *Inquiry*, 39, 273-94.
- Lynn, W., 1999, *Geoethics: Ethics, Geography and Moral Understanding*, Doctoral Dissertation, University of Minnesota.
- McAfee, K., 1999, Selling nature to save it? Biodiversity and green developmentalism, *Environmental Planning D: Society and Space*, 17, 133-154.
- McAfee, K., 2003, Neoliberalism on the molecular scale: economic and genetic reductionism in biotechnology battles, *Geoforum*, 34, 203-19.
- Minteer, B. A., 1998, No experience necessary? Foundationalism and the retreat from culture in environmental ethics, *Environmental Values*, 7, 333-48.
- Mooney, P. R., 1983, The Law of the Seed: Another Development and Plant Genetic Resources, *Development Dialogue* 1983, 1-172.
- Norton, B.G., 1987, A rationale for preserving species: an apology and a taxonomy, in *Why Preserve Natural Variety?* Princeton, N.J.: Princeton University Press.
- Pistorius, R. and J. van Wijk, 1999, *The Exploitation of Plant Genetic Information: Political Strategies in Crop Development*, Oxon, UK and New York: CABI Publishing.
- Proctor, J. D., 1998, Geography, paradox and environmental ethics, *Progress in Human Geography*, 22 (2), 234-255.
- Purdue, D., 1995, Hegemonic trips: world trade, intellectual property and biodiversity, *Environmental Politics*, 4 (1), 88-107.
- Raghavan, C., 1990, *Recolonization, GATT, the Uruguay Round & the Third World*, London and New Jersey: Zed Books Ltd.
- Regan, T., 1982, *All that dwell therein: animal rights and environmental ethics*, Berkeley: University of California Press.
- Rolston III, H., 1988, *Environmental Ethics*, Philadelphia: Temple University Press.
- Shiva, V., A. H. Jafri, G. Bedi, and R. Holla-Bhar, 1997, *The Enclosure and Recovery of the Commons: Biodiversity, Indigenous Knowledge and Intellectual Property Rights*, New Delhi, India: Research Foundation for Science, Technology and Ecology.
- Singh, A., R. Singh, and K. Singh, 1999, Trade-related intellectual property rights, biotechnology, biodiversity and Indian Agriculture, *Indian Journal of Agricultural Economics*, 54(3), 380-386
- Smith, N., 1996. Spaces of vulnerability: The space of flows and the politics of scale, *Critique of Anthropology*, 16(1), 63-77.
- Smith, N., 1992. Geography, difference and the politics of scale, in Doherty, E. Graham and M. Malek(eds.), *Postmodernism and the Social Sciences*, London: Macmillan, 57-79.
- Soule, M., 1995, The social siege of nature, in Soule, M. and G. Lease(eds.), *Reinventing Nature? Response to Postmodern Deconstructionism*.



Washington D.C.: Island Press.

- Swyngedouw, E, 1997. Neither global nor local: "Glocalization" and the politics of scale, *In* Cox, k.(ed.), *Spaces of Globalization: Reasserting the lower of the local*, New York: Guilford, 137-166.
- Swyngedouw, E, 2000, Authoritarian governance, power and the politics of rescaling, *Environment and Planning D., Society and Space*, 18, 63-76.
- Zelder, M., 1997, The cost of accosting Coase: a reconciliatory survey of proofs and disproofs of the Coase theorem, *in* Steven G. Medema(eds.), *Coasean Economics: Law and Economics and the New Institutional Economics*, Boston: Kluwer Academic Publishers, 65-94.

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