

Reinventing Colonialism: Biotechnology, Intellectual Property Rights and the New Economics of Sustainable Development

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ABSTRACT

This paper explores the contradictions inherent in one of the more popular buzzwords of today: sustainable development. I argue that despite claims of a paradigm shift, the sustainable development paradigm is based on an economistic, not ecological rationality. Discourses of sustainable development embody a view of nature specified by modern economic thought. One consequence of this discourse involves the transformation of “nature” into “environment”, a transformation that has important implications on notions of how development should proceed. The “rational” management of resources is integral to the Western economy and its imposition on developing countries is problematic and I discuss the implications of this “regime of truth” for the Third World with particular reference to biotechnology, biodiversity and intellectual property rights. I argue that these aspects of sustainable development threaten to colonize spaces and sites in the Third World, spaces that now need to be made “efficient” because of the capitalization of nature.

Keywords: Neocolonialism, sustainability, biopiracy, intellectual property rights

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“In the early phases of colonization, the white man’s burden consisted of the need to ‘civilize’ the non-white peoples of the world – this meant above all depriving them of their resources and rights. In the latter phase of colonization, the white man’s burden consisted of the need to ‘develop’ the Third World, and this again involved depriving local communities of their resources and rights. We are now on the threshold of the third phase of colonization, in which the white man’s burden is to protect the environment – and this too, involves taking control of rights and resources.....The salvation of the environment cannot be achieved through the old colonial order based on the white man’s burden. The two are ethically, economically and epistemologically incongruent.”

Mies and Shiva (1993: 264-265)

Introduction

After more than two hundred years of industrialization in the Western world and more than fifty years of “development” in the Third World, the benefits delivered by the grand design of progress and modernity are at best, equivocal. Despite phenomenal advances in science, technology, medicine and agricultural production, the promise that “development” would eradicate world poverty remains unfulfilled in several parts of the globe, especially in the Third World. “Progress” has come at a price: global warming, ozone depletion, loss of biodiversity, soil erosion, air and water pollution are all global problems with wide-ranging impacts on human populations, impacts that are significantly more harmful for the rural poor in Third World¹ countries, and for people who derive their sustenance from the land.

¹ A cautionary note on terminology: I use the terms “first world”, “third world”, “developed”, “underdeveloped”, “traditional”, “modern”, “colonizer”, “colonized” with an understanding of the essentialist and binary nature of these categories. For instance, I realize there are first worlds within third worlds and third worlds within first worlds but I deploy these and other categories here strategically and politically, in the spirit of what Spivak calls “strategic essentialism”. In some ways, my critique examines the foundations of knowledge construction about the Third World and the ways in which it becomes constituted and represented by a particular set of discursive power relations that underlie the development discourse. As Escobar (1992: 25) argues, “Third World reality is inscribed with precision and persistence by the discourses and practices of economists, planners, nutritionists, demographers and the like, making it difficult for people to define their own interests in their own terms – in many cases actually disabling them to do so”. Perhaps we can now add discourses and practices of environmentalists and conservationists to the list as the earlier quote by Mies and Shiva implies. While such categorizations

The concept of sustainable development has emerged in recent years in an effort to address environmental problems caused by economic growth. There are several different interpretations of sustainable development, but its broad aim is to describe a process of economic growth without environmental destruction. Exactly what is being sustained (economic growth or the global ecosystem, or both) is currently at the root of several debates, although many scholars argue that the apparent reconciliation of economic growth and the environment is simply a green sleight-of-hand that fails to address genuine environmental problems (Escobar 1995; Redclift 1987; Visvanathan 1991).

The discourse of biotechnology is gaining currency in recent years as a means to achieve sustainable development. In this paper I critically examine the concept of sustainable development and the colonial discourses that inform the new economics of sustainable development such as biotechnology. Employing theoretical perspectives from postcolonial theory and the development discourse, I examine the political, economic and developmental assumptions that inform the notion of sustainable development and discuss the consequences of these assumptions. I argue that sustainable development, rather than representing a major theoretical breakthrough, is very much subsumed under the dominant economic paradigm. Like development, meanings, practices and policies of sustainable development continue to be informed by colonial thought resulting in disempowerment of the majority of the world's population, especially rural populations in the Third World. Discourses of sustainable development are also based on a unitary system of knowledge and despite its claims of accepting plurality there is a danger of marginalizing or co-opting traditional knowledges to the detriment of communities who depend on the land for their survival. I discuss the implications of this regime of truth in contemporary discourses on biodiversity, biotechnology, and intellectual property rights.

might preclude a sense of agency for Third World resistance movements, I discuss in the conclusion section of the paper how transgressions of these categories could create new spaces of resistance.

Sustaining Colonial Control of Biodiversity: The Role of Biotechnology and Intellectual Property Rights

The globalization of industrialized agriculture has been under attack for more than twenty years. Increased production per hectare was achieved at significant environmental costs including the use of greater chemical and non-renewable energy inputs. The practice of monoculture, involving the transformation of centuries old traditions of self-sustaining crop rotational practices into cash crop agriculture, had serious ecological, biological and economic consequences for peasant farmers in the Third World. Modern agricultural methods may have created bumper harvests, however it also replaced biological diversity with uniformity making crops more vulnerable to attack from pests, leading to a greater dependence on chemical pesticides. The focus on the technologies involved in the production of chemical pesticides also served to marginalize existing indigenous knowledge about plant and seed varieties.

The chemical revolution depended on the genetic resources that were cared for and sustained for thousands of years by peasant farmers, these were obtained free of charge by corporations and scientific institutions to develop high-yielding varieties that were dependent on chemical fertilizers for their yield levels and subsequently sold to the farmers as a package, complete with chemical fertilizers and pesticides. Thus, these production techniques determined what kinds of crops could be grown in order to recoup investments on modern agricultural techniques. While economic value was placed on cash crops bought and sold through international markets, there was no evaluation, economic or otherwise, on the loss of agricultural biodiversity and its effects (Guha and Martinez-Alier 1997). For instance, there were more than 30,000 varieties of rice grown in India at the turn of the last century, today there are less than 50 varieties and is expected to diminish to ten in the next five years (Shiva 1993; Wilson 1992).

Measuring output per hectare is an easy task but it is virtually impossible to construct indicators that measure genetic erosion. More importantly, it is impossible to forecast the ecological and economic consequences of such a loss. However, science has once again come to the rescue, with a new revolution:

biotechnology. As we shall see, this new revolution of biotechnology is simply a logical continuation from the “chemical revolution” of the 1950’s and not only serves to sustain corporate and scientific structures of power but also threatens to colonize life forms and recolonize spaces in the Third World, a region that contains two-thirds of the world’s plant species.

If the success of development was based on transforming “untamed” nature into a more manageable environmental resource, it should not come as a surprise that advances in science and technology would ultimately lead to the control and ownership of life itself, via the transformation of genetic material in plants and animals into “knowledge” and “intellectual property” belonging to corporations. The fact that this “knowledge” existed and has been used by indigenous communities for thousands of years is somehow not relevant: it is either dismissed as a “philosophical” issue or incorporated into the Western environmental discourse as “traditional ecological knowledge” that needs protection because of its “world heritage” value. Laws governing protection of intellectual property are governed by Western technocentric notions that are biased against indigenous communities (Blakeney 1997). Under existing laws, patents are granted for inventions that must be “novel” and the rights of the creator of this novelty are protected. Novelty is assessed by reference to prior technological use. There are millions of people in the world who do not fit this model, indigenous custodians of medical knowledge and peasant cultivators of seeds for example, and who are denied intellectual property protection.

Patents and intellectual property laws on genetic resources such as seeds, protect and serve corporate and institutional interests of developed countries while violating peasant and farmers’ rights in the Third World. Medicinal plants, cared for and sustained by indigenous cultures, were appropriated by pharmaceutical companies without any payment and later used to develop profitable drugs that were protected by patents and trademarks. The knowledge of indigenous cultures in recognizing and using the medicinal properties of these plants is positioned as “traditional” and not “novel” and hence can be obtained without payment, while the “knowledge” of pharmaceutical companies requires protection.

Indigenous knowledge does not fit into the current intellectual property framework and their knowledge by itself has no “economic value” unless it is commodified for the purposes of the market. Only then can it be assigned “value” and be eligible for protection, which explains the current alacrity at which chemical and pharmaceutical corporations are investing in genetic engineering and biotechnology. Biotechnology, touted as a champion of sustainable development, simply sustains a more sophisticated mode of colonial control that continues to inscribe its violence on peasant communities.

Peasant struggles to control seeds and medicinal plants are being fought in many countries and several social movements in Mexico, Latin America and Asia have raised these issues at international conventions of the United Nations Economic Program. The International Convention on Biodiversity was established at Rio de Janeiro in 1992 to address the implications of biodiversity conservation and use. However, as Shiva (1993: 151) argues, the Convention on Biodiversity (CBD) was primarily “an initiative of the North to ‘globalize’ the control, management and ownership of biological diversity... so as to ensure free access to the biological resources which are needed as ‘raw material’ for the biotechnology industry”. The biodiversity “crisis” arose because of rampant industrialization and unbridled economic growth resulting in habitat destruction and the replacement of diversity with homogeneity in agriculture and forestry (Shiva 1993). This crisis is almost always represented as a Third World phenomena and the solution developed and applied by the North is to conserve biodiversity in the South. Evidence of this can be seen in policy documents of the World Bank and United Nations Environmental Program as well as in scientific texts. For instance, in his popular book *The Diversity of Life*, Edward Wilson describes in detail the biological history of the planet and the negative human impact on biodiversity. While acknowledging that richer countries dictate the rules of international trade, Wilson claims that it is their responsibility to “use this power wisely”. In providing some solutions to the biodiversity problem, Wilson advocates promoting sustainable development – for the “striving billions of rural poor in the Third World”. Almost nothing is said about the corresponding responsibility of the striving millions of urban rich in the First World. A similar slippage can be observed in the Agenda 21

document: the “action plan” for sustainability involves “enabling the poor to achieve sustainable livelihoods” (Hawken 1995: 216) without any mention of the unsustainable livelihoods of the rich that do not allow the poor to achieve sustainable livelihoods. Thus, sustainable development proceeds the way as development did – the problems are located in the South, the solutions in the North - and continues to obscure how the political economy of the process destroys biological diversity (Shiva 1991).

Despite using the right phrases – “sustainable”, “inclusiveness”, “local custodians”, the CBD is very much a top down process imposed on local communities, similar to the way the “Green Revolution” was orchestrated. The CBD negotiations took place after years of North-South conflicts over resources and rising environmental concern. The initial position was that genetic resources were a “common heritage to man” (Downes 1996: 171) and “biodiversity information belonged to no one and could be exchanged freely among the countries of the world”. Developing countries, justifiably suspicious of the price they will pay for this “free exchange” of information supported the current view as expressed in Article 15 of the CBD that provided national sovereignty over genetic resources, “combined with an obligation to facilitate access by other countries” (Bugge and Tvedt 2000). This “obligation” is to be operationalized through granting of individual permits to interested parties, raising an interesting question: while “sovereignty” over genetic resources is now clearly established, there is no mention in the CBD about *ownership* of the resources, whether by the state, private landowners or indigenous communities through common property rights. Conflicting interests over resources between nation states probably resulted in the “constructed ambiguity” of many of the articles in the CBD that do not provide legal rights to any party in particular.

The CBD is essentially a compromise agreement between conflicting North-South interests. While 172 countries have ratified the CBD, the United States, not unsurprisingly, refused to ratify the convention on the grounds that it would pose a threat to the U.S. biotechnology industry. Although the CBD was a first step in addressing issues of biodiversity and conservation, it did very little in real terms for indigenous and peasant communities who were protesting the violation of their rights. Technocentric

notions strongly informed strategies of biodiversity conservation and the CBD concentrated too heavily on issues of financing, access of business corporations to genetic diversity, and technology transfer than on peasant and indigenous peoples' rights. Critics point out that the CBD placed too much faith on biotechnology and technological fixes to prevent loss of biodiversity, creating "a reliance on the diversity created through technology which would replace the respect for the diversity found in nature" (Munson 1995).

Article 2 of the CBD gives states the "sovereign right to exploit their own resources pursuant to their own environmental and developmental policies" along with the responsibility to ensure that these activities "do not cause damage to the environment beyond the areas of national jurisdiction" (Hallman, 1995). While this might appear to be a victory for Third World nations over the developed countries, there are grave doubts whether the ownership of genetic resources by states will help the rural poor or indigenous communities (Guha and Martinez-Alier 1997). The imposition of market economies on transactions that were out of the market, such as the "subsistence" economies of peasant populations or genetic resources used by them, confers a value and a price based on an external political economy, a price that is bound to be very low because these communities are poor to begin with. As McAfee (1999) argues, if the distribution of the benefits of biodiversity is to be determined by market forces, then the world's economic elites will benefit disproportionately. Compensation based on market mechanisms will simply serve to further disempower and impoverish the rural poor. Several farmers' organizations, indigenous groups and NGO's are fighting this battle at different levels and the fight to maintain possession of land and resources is not just an economic struggle, it is a cultural struggle fought by communities to ensure their survival. While their efforts have contributed to the recognition at the Rio Convention that indigenous peoples have used and conserved genetic resources for thousands of years, the CBD does not ensure their ownership and management rights to these resources. Allowing these rights to be legislated by nation states is also problematic given the nexus between governments,

corporations and international trade institutions, none of which represents interests of indigenous or peasant communities.

For example, several indigenous groups and NGO's have raised concerns about the apparent incompatibility between the CBD and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) developed by the World Trade Organization (WTO). Article 8 (j) of the CBD declares that states should:

“Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices”.

Article 27.3 (b) of the TRIPS agreement states:

“...(Members may also exclude from patentability) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof.” (WTO 2000).

Dawkins (1997: 27) provides a clearer interpretation of the above clause: “...this means that anything that can be genetically manipulated can be patented and monopolized as the private property of transnational agricultural and pharmaceutical corporations”. While the CBD calls to “respect, preserve and maintain” traditional knowledge of indigenous communities the TRIPS agreement legitimizes private property rights through intellectual property over life forms. These rights are for individuals, states and corporations, not for indigenous peoples and local communities. In effect, governments are asked to change their national intellectual property rights laws to allow patenting of “micro-organisms, non-

biological and micro-biological processes.” The TRIPS agreement resulted in mass protests by indigenous and peasant communities along with NGO’s in Asia, Africa and South America that continue to this day (Dawkins 1997).

There are two related problems that arise from imposing a regime of intellectual property rights on indigenous knowledge. First, “traditional” knowledge belongs to the indigenous community rather than to specific individuals. Second, as indigenous communities all over the world have discovered, national governments are increasingly employing neoliberal agendas (some willingly, a majority through coercion) that have adverse impacts on their livelihoods because of restricted community access to natural resources. “Equitable” sharing of commercial benefits through mutually beneficial contracts between indigenous groups and transnational corporations are unlikely to occur given the disparities in resources and capacities to monitor or enforce the terms of any contract.

Take for example the much publicized bioprospecting agreement with Merck and the Instituto Nacional de Biodiversidad (INBio) of Costa Rica, touted as a “model” agreement under the Convention on Biological Diversity. Under the terms of this agreement, INBio agreed to provide Merck with chemical extracts from “wild” plants in exchange for an undisclosed share of royalties from any resulting commercial products (Mooney 2000). INBio also agreed to allocate 50% of any royalties it may receive to the Costa Rica National Park Fund. Although hailed by corporations, governments and several environmental organizations as a “model” agreement, the rights of indigenous communities did not appear to play any part in the process. Biodiversity was being “conserved” by national institutions for transnational corporations and their customers at a bargain price for the company (not to mention the enormous public relations boost for the company). How a national organization like INBio can be counted on to protect indigenous interests is doubtful given that its central activity is “the generation, organization and dissemination of biodiversity knowledge and rational use of it at the national and international level” (Mateo 2000: 46). There seems to be a curious silence of its role or impact at the local level, especially the acknowledgment that local communities have always “generated, organized and

disseminated” biodiversity knowledge in very “rational” ways until this was appropriated without compensation. Royalties and compensation however useful, still do not address the lack of local control of knowledge and its transfer to national and international institutions. Recognition of the “national sovereignty” of Costa Rica over its biological diversity will be of little benefit to indigenous communities that have developed and sustained that biodiversity for thousands of years – in fact it marks a dilution of their rights over their land and is an example of how bioprospecting is really biopiracy couched in the rhetoric of “corporate citizenship” and “sustainable development”, a rhetoric that obscures the reality of colonial development. In several other cases of bioprospecting in Thailand, Malaysia and Africa the outcomes for indigenous peoples has been the same with hardly any compensation or “technology transfers” as specified by the CBD.

The strong pressure from the World Trade Organization, transnational corporations and developed countries to establish a global intellectual property rights regime will ensure that the rights of the corporations at least are protected. The sovereign rights of local communities, whose cultural survival cannot be separated from the biodiversity of their environment are not addressed by the CBD. Biotechnology impacts these communities in an irreversible way: biodiversity simply becomes raw material (information) for biotechnology. However, the products of biotechnology become genetically uniform substitutes of the original biodiversity used as raw material. Modern scientific notions of biodiversity conservation again misspecify the problem: rather than approach biodiversity conservation as a conservation of the “means of production”, it conceptualizes the problem of as conservation of “raw material” (Shiva 1991). Since the problem is articulated incorrectly, the solution that biotechnology will lead to biodiversity conservation is also wrong: it can produce a diverse range of *commodity products* but will breed uniformity in life with destructive effects on indigenous communities all over the world. As Shiva (1991) argues, global discourses of biodiversity fail to recognize that biodiversity is intimately linked with survival of indigenous and local communities where farmers produce both the product and the means of production, not just “raw material”. This free germplasm is used by corporations to produce

genetically engineered non-generative seeds (a product that can be patented) and it is this shift “from the ecological processes of reproduction to the technological processes of production that underlies both the problem of dispossession of farmers and tribals and the problem of erosion of biodiversity” (Shiva 1991: 52). Thus, biotechnology far from being the savior of biodiversity is an inherently imperialistic narrative that produces a replication of uniformity and colonizes spaces and sites in the Third World, spaces that now need to be made “efficient” because of the capitalization of nature. The assumption that efficiency is automatically and universally desirable is rarely questioned in scientific and economic discourses. Consequently, notions of nature as a commodity in a global market are discursively produced as is the notion that communities and states exist to sustain economies and not vice versa.

The regime of intellectual property rights creates a new meaning of biodiversity that focuses on commodifying and trading the benefits of biodiversity. For this to occur, privatization and ownership are necessary conditions (Redclift 2000) where once again biodiversity becomes framed as market preferences resulting in the poor (but “biodiversity rich” populations) sustaining the rich. Assessing market preferences for nature is based on invalid assumptions, as McAfee (1999: 133) argues, “contrary to the premise of the global economic paradigm there can be no universal metric for comparing and exchanging the real values of nature among different groups of people from different cultures, and with vastly different degrees of political and economic power”.

The application of intellectual property rights to biodiversity conservation suffers from the same reductionist view of life. The emergence of the “life sciences” industry marks the convergence of a number of industries including agriculture, chemicals, pharmaceuticals, food processing, cosmetics, computer hardware and software and energy (Enriquez and Goldberg 2000). Technological and economic forces driving these changes are also reinventing conceptions of nature that mirror their relationships with the natural environment (Rifkin 1999). Thus, nature itself is defined as “the storage and transmission of information within a system” (Waddington 1977: 145) where everything in nature is seen as genetic information that can be manipulated, controlled and organized, a process that is

constituted and discoursed as part of the “natural” evolution of humanity itself, evolution that is “in the end, the process by which the creature modifies its information and acquires other information” (Grassé 1977: 23). Everything becomes a series of information systems including institutions, corporations and the natural world where success and progress is assessed by the quality and speed of information processing. According to Robert Shapiro, Monsanto’s ex-CEO, “biotechnology is really a subset of information technology because it is about DNA-encoded information” (Magretta 1997).

These new concepts of nature, apart from assuming no material ecological impact, provide legitimacy for the dominant order and ruling elites. As Harvey (1996: 147) points out, notions of “scarcity” and “limits” in natural resources are also rooted in social systems where a natural resource becomes a “cultural, technical and economic appraisal of elements and processes in nature that can be applied to fulfill social objectives and goals through specific material practices”. For example, the mechanisms of ensuring “free and fair” flow of information that are developed and proposed, such as intellectual property rights on genetically modified living organisms, serve to protect certain interests. The controversial Trade Related Aspects of Intellectual Property Agreement (TRIPS) at the Uruguay Round of the GATT was developed “in large part” by a committee called the Intellectual Property Committee (IPC) consisting of many transnational firms including Bristol Myers, Merck, Monsanto, Du Pont and Pfizer. Monsanto’s representative described the TRIPS strategy:

“...(We were able to) distill from the laws of the more advanced countries the fundamental principles for protecting all forms of intellectual property...Besides selling our concept at home, we went to Geneva where we presented our document to the staff of the GATT Secretariat...What I have described to you is absolutely unprecedented in GATT. Industry identified a major problem for international trade. It crafted a solution, reduced it to a concrete proposal, and sold it to our own and other governments...the industries and traders of the world have played simultaneously the role of patients, the diagnosticians and the prescribing physicians” (cited in Rifkin 1999: 52).

Thus, nature, once a commons and a resource, is now reinvented as a vast gene pool, inspiring “today’s molecular biologists and corporate entrepreneurs in their quest to capture and colonize the last frontier, the genetic commons that is the heart of the natural world” (Rifkin 1999: 170).

Some advocates argue that an IPR regime will help conserving biodiversity, recognizing the “essential value of biological diversity: its informational content” (Swanson 1995:169). The rationale is that “human capital” does not produce all important and valuable information but there is a “base biological dimension that generates information”. This “base biological dimension” is the “evolutionary process” and the task is to develop a fair and equitable system that can appropriate “evolution’s values”. Swanson (1995: 171) goes on to say:

“To a large extent, the extension of ‘intellectual property’ regimes to include natural resource-generated information simply levels the playing field between those societies which are more heavily endowed with human capital and those that are more heavily endowed with natural forms of capital. It is a very rational approach to the resolution of the biodiversity problem.”

The problem with this statement is the nature of the “rational approach” and the framing of the “biodiversity problem”. The valuation of biodiversity is based on their potential international economic value that ignores or underestimates the values ascribed to nature by peasant populations with negligible purchasing power in the global supermarket (McAfee 1999). Far from “levelling the playing field”, the intellectual property rights regime constructs problems and applies solutions in a way that acknowledges “diversity-rich but cash-poor” countries only if they accept privatization of their commons as well as their knowledge. This argument also resonates with other conservation strategies dictated by the North, such as the creation of “national” parks based on a vision of pristine, unspoiled, intact nature. The problem of course, is that indigenous inhabitants of these parks are also subsumed into the category of nature and conservation denying them the right to determine what direction their future should take (Perera and Pugliese 1998). There is an important distinction between what Dasmann (1988) calls “biosphere people”

- those who have the entire biosphere at their disposal and “ecosphere people” - the indigenous peoples whose subsistence is intimately linked with the ecosystems in which they live. As Dasmann (1988: 303) points out, “...The impact of biosphere people upon ecosystem people has usually been destructive...Biosphere people create national parks. Ecosystem people have always lived in the equivalent of national parks”.

Scientists, business and government leaders often hail biotechnology as an advance that will end world hunger. The difficulty with this of course, is a misspecification of the problem: that hunger exists because of a gap between food production and population. The reality is that in 1999 the world produced enough food to feed every child, woman and man, yet more than 800 million people went hungry. More telling is a report from the FAO that estimates that 78% of all malnourished children in the developing world live in countries with food surpluses (Food and Agriculture Organization 2000). The report also identified poverty and lack of access to food as major causes of hunger rather than population. A biotechnological food fix for world hunger is not a paradigm shift: it is a continuation of the (post)industrial model of agriculture that constructs problems of the poor and applies solutions developed, without consultation, by scientists and experts from the North without addressing fundamental inequalities in income and access to natural resources. This “sustainable” form of development represents world hunger as a demand for genetically modified food rather than as an outcome of repressive conditions in the global social and political economy. There is no doubt that biotechnology could treble or quadruple food production in the next 50 years, however people will probably still go hungry.

The reinvention of nature through biotechnology also involves attempts by corporations that control this technology to reinvent themselves. The same chemical and pharmaceutical corporations that benefited most in the modernization of agriculture (as well as in the manufacture of chemical weapons), now control most of the biotechnology industry after having invested more than \$9 billion in the last few years, and through discourses of sustainable development, are attempting to distance themselves from their past “unsustainable” activities. Monsanto Corporation, one of the manufacturers of the infamous

defoliant Agent Orange, is reinventing itself as a “life sciences” company, complete with a logo of a plant sprout and the words Food-Health-Hope (Strong 1999). This “discontinuity” is typified by Monsanto’s strategy of “replacing stuff with information”, a reference to their genetically engineered crops that are currently on the market. The Monsanto product Roundup, the world’s largest selling herbicide (whose patent expired in 2000) is an example. Through biotechnology, Monsanto developed a new strain of soyabean that was genetically engineered to resist Roundup and promoted a new farming technique for genetically engineered soyabean that involves spraying the entire field with Roundup, which destroys the weeds but does not harm the soyabean crop (Monbiot 1997). Buoyed by the success of their Roundup product, Monsanto, along with several other transnational chemical and pharmaceutical corporations, embarked on an ambitious program of acquisitions of seed and biotechnology companies. These corporations now control over 70% of the world’s seed markets. The development of the “terminator seed”, genetically engineered to sterilize seeds produced by crops, also ensures that farmers’ future right to grow seeds does not exist: the agreement to use these products comes with the company’s right to inspect farmers’ fields whenever the company desires. Worldwide protests by NGO’s and farmers compelled Monsanto to withdraw introduction of the terminator seed and marked a victory (for the present at least) for small farmers everywhere.

While this might seem a strategic discontinuity for chemical corporations, it marks a continuation of the colonial control of natural resources of Third World farmers and peasant populations by the industrialized countries. It also allows the future of nature to be technologically determined despite the fact that biotechnology with its so-called “smart” products address symptoms, not underlying problems of access to resources or alternate modes of agricultural production. Monsanto’s NewLeaf Potato is a case in point: it is genetically engineered to destroy its biggest pest, the Colorado Potato Beetle. This scientific solution was developed and applied because of the way the problem was constructed: the Colorado Beetle became the problem that needed fixing, rather than monocultural cropping which caused the potato crop to be susceptible in the first place (Kloppenborg and Burrows 1996). This is a

reductionist form of knowledge: biotechnological processes for chemical synthesis of natural plants involve isolating one particular use of a plant molecule in nature's complex labyrinth, and replicating this fraction chemically. This system of knowledge contradicts the very notion of diversity in nature and is perversely touted as the savior of biodiversity. The same knowledge system constructs peasant farming techniques as backward and unsustainable and while great pains are taken to protect knowledge and intellectual property of corporate interests through international patents, the knowledge appropriation from farmers and peasant populations is never made an issue.

Patenting of life forms through intellectual property rights continues this violence. Appropriating traditional ecological knowledge of indigenous peoples for the advancement of Western science and medicine through patents and intellectual property rights is simply another violation of indigenous rights. So-called "bioprospecting" efforts of transnational corporations should be seen for what they are – biopiracy against the world's peasant populations. The recent battle over patenting extracts from the Neem tree, known and used for its medicinal properties for thousands of years, is an example of this biopiracy. Claiming intellectual property rights over Neem extracts is based on a system of multiple exclusions that denies indigenous knowledge and agricultural practices. The knowledge that these extracts could be used for medicinal purposes, as pesticides, as contraception, existed earlier and was "in the prior public domain" which is what patenting laws seek to establish. If this knowledge had existed in the West, these patent applications would never have been considered. The fact that this prior knowledge existed in poor rural communities allowed a non-novel entity to be constructed as novel and patented under current intellectual property rights legislation (Shiva 1993). The struggle is far from over: legislative changes in the European Union recently allowed patents to cover life forms (Downes 1997). The number of applications for genetic patents received in the United States rose from 4,000 in 1991 to 500,000 in 1996 (Enriquez and Goldberg 2000). The World Trade Organization is also under pressure by the U.S. to remove the exception it currently has on life forms and to accept as well as enforce patents on life forms.

Third World activists and NGO's have raised these arguments in a number of national and international forums and the response from corporations is similar to the statement made by Monsanto's ex-CEO discussed earlier: these were ethical and philosophical dilemmas and had no place in the "cold rational logic of business". There is also another argument which states that the Third World is too poor and cannot afford to worry about bioethics. As Shiva (1993) has pointed out, the dichotomy between ethics and knowledge is a Western construct that enables colonization and control of cultures where no such dichotomy exists. It is the illusion of neutrality of this "ethics-free" knowledge that is able to deny alternate knowledge systems. It is this knowledge that constructs more than half the world's population as backward and ignorant without realizing that ignorance, like knowledge, is socially constructed.

Alternate Visions

While I have painted a fairly dismal picture of the domination effects of environmental discourse, it is important to realize that its practices and policies are contested in a variety of sites. Resistance movements against globalized corporate agriculture and biotechnology have emerged in different parts of the world. Global alliances among diverse groups have had recent successes, most notably the failure of the WTO Third Ministerial Meeting in Seattle in 1999. As Shiva (2000) argues, solidarity between different groups, scientists, planners, environmentalists, producers and consumers is needed to prevent resistance being marginalized (or polarized as one between "uninformed citizens" and "informed scientists") and for the debate to continue in the public sphere.

There are many groups all over the world that are engaged in dialogue, protests, violent and non-violent action with corporations, governments and international institutions. These vary from small, locally based activists to large, powerful NGOs, environmental organizations as well as coalitions of different groups such as the "The 50 Years Is Enough: U.S. Network for Global Economic Justice" which is a coalition of over 200 grassroots, women's, solidarity, policy, social and economic justice, youth, labor and development organizations working at international, national and local levels in an attempt to

transform lending policies and structural adjustment programs of the World Bank and the International Monetary Fund. The “50 years is enough” refers to 50 years of development policies in Africa which the coalition claims has been a complete failure with overall standards of living lower than what they were 50 years ago. One of the more successful resistance movements, the Zapatista uprising in Chiapas used a similar slogan *¡Basta ya!* (Enough!) when they presented their 11-word program to the Mexican government: “*Trabajo, Tierra, Techo, Pan, Salud, Educación, Democracia, Libertad, Paz, Independencia, y Justicia*” (work, land, shelter, bread, health, education, democracy, liberty, peace, independence, and justice) (Ross 2000: 20).

If visions of sustainable development are to have an emancipatory goal, there needs to be a reconceptualization of current notions of progress and development. These concepts not only limit but represent a failure of the imagination: the Western technocentric approach only serves to empower corporate and national economic interests and prevents communities from preserving their rights to control their resources. An unpacking of the notion of development is required and concepts of sustainability must go beyond seeking a compromise between environmental protection and economic growth. It involves reversing the industrial appropriation of nature as well as recognizing the structural and natural limits of sustainable development (Redclift 1987). It requires a search not for developmental alternatives but for alternatives to development (Escobar 1995). The current focus on capital and markets to achieve sustainable development is restrictive and disallows alternate ways of thinking and knowing. We need to apply insights from other forms of knowledge, however “traditional” they may be defined, and interpret these knowledges in economic, scientific, political, cultural, and social terms that challenge existing views of the world and of nature. Sustainable development is not just about managerial efficiency (although that has a part to play); it is about rethinking human-nature relationships, re-examining current doctrines of progress and modernity and privileging alternate visions of the world. It requires a retracing of steps to the juncture where “nature” became transformed into “environment”, distancing the natural world and positioning it as a resource to be mastered in a similar way to which

human feelings and expression become mastered through “culture”. Contemporary notions of sustainable development are embedded in the development discourse that requires the death of nature and the rise of environment. Alternate visions can be imagined only by rescuing sustainable development from this dichotomy.

A critical perspective will enable us to recognize that current norms for sustainable development have emerged within a particular historical context, which is the modern capitalist notion of the business corporation operating within a Judeo-Christian ethical framework. While making this assumption explicit and critically examining its implications, we should also seek alternate ways of constructing knowledge and developing norms. Current management theories rarely question whose norms are used, rather they tend to normalize conflicting criteria for development and progress. As Rifkin (1999) points out rather than focus on the “good” and “bad” aspects of the new technologies, we need to ask difficult questions. What are the consequences for the global economy and society of reducing the world’s gene pool to patented intellectual property controlled exclusively by a handful of transnational corporations? What are the structures and processes of power inherent to the new technologies? What is its impact on the biological diversity of the planet? Who controls this technology? What are its social and cultural impacts? Although developing countries continue to argue for access to these new technologies in various international forums, caution should be exercised in monitoring the impact of these technologies in order not to repeat the mistakes of the Green Revolution, which while enhancing crop production in a few regions, also accentuated inequalities and increased income disparities (Shiva 1991).

Deconstructing singular constructions of nature is also important since it allows us to examine how notions of nature are linked with dominant ideas of society, or what Catton and Dunlap (1978) call the “dominant western world view”. An understanding that meanings of nature are derived from societies and cultures allows us to examine “what ideas of society and of its ordering become reproduced, legitimated, excluded, validated through appeals to nature or the natural” (Macnaghten and Urry 1998: 15). For instance, universalized scientific discourses of the environment tend to ignore local cultural

differences in North-South trade and environmental relations while masking neo-colonial modes of development where “‘global’ environmental problems creates the moral base for green imperialism” (Shiva 1991). The scientific rationality of ecological modernization constructs a global discourse of environmental problems where the only solution is for society to “modernize itself out of the environmental crisis” by increased investments in new “environmentally friendly” technologies.

The rhetoric of democracy and participation in contemporary discourses of free markets and international forums on sustainable development also needs to be examined with a critical lens. At the 1992 Rio Summit there were open conflicts between corporations, their trade associations, NGOs, and indigenous community leaders over environmental regulations. The demands of NGOs were ignored and a voluntary code of conduct developed by the Business Council for Sustainable Development (consisting of a number of transnational corporations) approved instead in what was supposed to be a democratic process of developing an action plan for sustainable development (Hawken 1995). Development, sustainable or otherwise, in a globalizing world is inherently anti-democratic as several indigenous groups have found. As Subcomandante Marcos, a leader of the Zapatistas stated:

“When we rose up against a national government, we found that it did not exist. In reality we were up against financial capital, against speculation, which is what makes decisions in Mexico as well as in Europe, Asia, Africa, Oceania, North America, South America – everywhere”. (Zapatista 1998).

The story is familiar to indigenous communities all over the world. In this case, officials of the World Bank met in Geneva and decided to give a loan to Mexico on condition they export meat under the agreements laid down by the World Trade Organization. Land used by indigenous communities to grow corn is now used to raise cattle for fast food markets in the U.S. This is an inherently undemocratic process where peasant populations do not have the right to decide how they want to live. This is another example of how imperialism operates in the Third World: where one “state” (in this case representing the interests of the rich countries, the international institutions they support and their transnational

corporations) controls the effective political sovereignty of another political society, by force, by political collaboration, by economic, social or cultural dependence. The following was a response to the Zapatista uprising by a transnational bank, a major financier in the restructuring of Mexico's economy:

“The government will need to eliminate the Zapatistas to demonstrate their effective control of the national territory and security policy”

Mexico, Political Update, Chase Manhattan Bank.

(Zapatista 1998).

If this is an example of a corporate “triple bottom line” strategy to integrate social issues, the future for resistance movements is very bleak indeed.

Conclusion

Sustainable development, despite its promise of local autonomy, is not egalitarian because environmental destruction is not egalitarian: it is more devastating for people who possess few resources to prevent the devastation of their natural spaces (Bullard 1993). If, as Amartya Sen (1999: 3) states, “the quality of life should be measured not by our wealth by our freedoms”, then contemporary discourses of sustainable development, despite their emphasis on quality of life falls short on delivering freedoms; in fact like development, it delivers economic unfreedoms to a marginalized majority of the world's population. These populations are more often than not composed of the poor, the people of color, the women, and the children of the Third World (Bandy 1995). The literature on sustainable development has virtually no discussion on empowerment of local communities except some passing references to “consulting” with communities or “ensuring their participation” without providing any framework on how this is to be achieved (Derman, 1995). While it does critique the growth model of development, it positions marginalized local communities as either victims or beneficiaries of development. In the era of sustainable development it appears these communities will continue to be inscribed as passive objects of Western history and continue to bear the brunt of what Mies and Shiva (1993) ironically call the “white

man's burden", a burden that means further loss of community rights and resources. The new biotechnologies of sustainable development have the potential to transform farmers into factory workers on a global scale (Dawkins 1997).

While continuing the epistemic violence of colonial development, sustainable development simultaneously reifies global capitalism as the liberating and protecting force that can ensure survival of the human race - this is the logic of the world it seeks to construct and impose. The Third World, still in need of development, now needs to be told how to develop sustainably. The consumer is still the king: nature is not understood so much as consumed and power dynamics in this new era of globalization and postdevelopment remain unchanged (Banerjee and Linstead 2001). As Bandy (1995) argues, the sustainable development discourse is a new rhetoric of legitimation: legitimation of markets, of transnational capital, of Western science and technology and of Western notions of progress that legitimise the violence of (post)modernity. The challenge of sustainable development is ultimately about challenging this legitimacy, it is about challenging the epistemological foundations of knowledge and of the power this knowledge has in defining reality. Perhaps revisiting other knowledges will enable us to define another reality, a reality that does not privilege the nature-culture dichotomy that has proved so disempowering for billions of people in the planet. But that is another story.

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